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THE DEATH OF THE CAPITAL SHIP: IS THERE A PLACE FOR
SUPERCARRIERS IN MODERN NAVIES



By Blake Klinedinst, LCDR, USN

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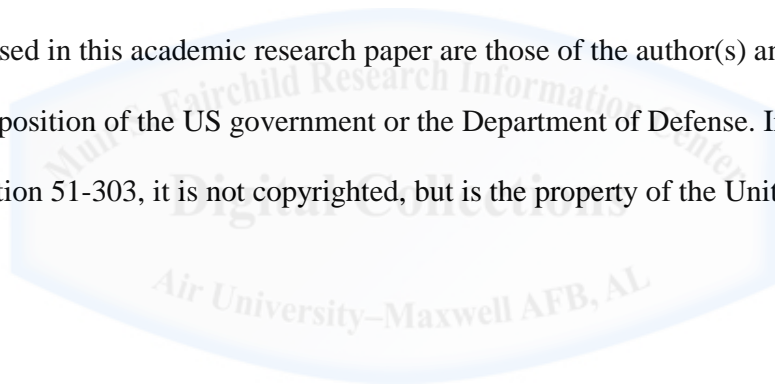
Advisor: Dr. Paul J. Springer

Maxwell Air Force Base, Alabama

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Abstract

The HMS Dreadnought was the preeminent capital ship of the world when she was launched. In the first half of the twentieth century nations all over the world raced to build the biggest and strongest fleet of battleships. During World War II this all changed. After reviewing the rise and fall of battleships as the preeminent capital ship of the world's navies, this paper will examine why the modern capital ship, the supercarrier, has not experienced the same cycle of nations competing against one another to produce the most advanced supercarrier. Included in this examination is why the United States is travelling a dangerous path by continuing to pour billions of dollars into producing new supercarriers.

As the only nation fielding carrier battle groups, the United States has made supercarriers the prime target for any adversary's strategy to counter the US Navy's supremacy in naval warfare. Because there is such a heavy concentration of resources in a supercarrier, they limit the options available to policy makers when confronted with defenses that could kill or damage them. The paper concludes that supercarriers should be replaced with smaller options that provide the ability to project smaller increments of airpower around the world but without breaking the budget or providing the enemy with strategic targets that are difficult to replace.

The Capital Ship Reigns Supreme?

Like most weapons of destruction created in times of peace, the first function of the battleship was to instill fear in the hearts of men.

-Richard Hough
Death of the Battleship

Alfred Thayer Mahan envisioned great battles between lines of capital ships as the epitome of naval warfare. His theories inspired countless naval leaders to believe that in war the winners controlled the largest number of capital ships as well as the biggest capital ships. This helped to foster the production of larger and more powerful battleships during and after World War I. Prior to World War II the power of a nation's navy was determined by the number and capabilities of battleships in their order of battle. While there is no doubt that battleships were the preeminent platform in any naval gunfight they proved inadequate when faced with the relatively new weapons of airplanes and torpedoes. So effective at defeating the battleship were these relatively cheap weapon systems that eventually these epochal capital ships became obsolete and over time were phased out of service in every navy in the world. However, despite the fact that decisive combat involving fleets with battleships only occurred once in history (Battle of Tsushima), nations were not deterred from building, manning, and depending on battleships to carry out "power diplomacy".¹ Had World War II not proven the vulnerability of battleships to attacks by aircraft and torpedoes, battleships may have remained the mainstay of many navies order of battle even today, with the aircraft carrier still operating in a supporting role.

What exactly is a capital ship? By almost any definition of a capital ship the battleship fits the requirements. The requirements of a capital ship must include, at the very least, its ability to protect sea lines of communication, its ability to exert sea control within a given region by fighting force-on-force and defeating the enemy when necessary, and its ability to symbolize

a nation's determination to fight and win in peacetime and war; the battleship fulfilled all of these.² But when looking at the post-battleship navies for a replacement capital ship there is only one that can meet all of these requirements and that is the aircraft carrier. However, an aircraft carrier's abilities as a capital ship are primarily measured in airpower vice the size of her guns, displacement, or thickness of armor. For no matter how thick the armor is or how fast the carrier can go if it cannot launch aircraft it becomes no more useful than a target barge. This is an important distinction because the battleship could take a large amount of damage and continue to fight, whereas the aircraft carrier must be able to launch aircraft in order to be effective. Therefore, much more so than a battleship, an aircraft carrier must rely on an assortment of other ships to provide direct defense against threats such as anti-ship missiles and torpedoes. Hence, a carrier needs screening vessels to protect it from getting directly involved in a battle. But if the only role of the aircraft carrier is the supplier of airpower to the battle fleet, does this in fact make it a capital ship?

The HMS Dreadnought revolutionized battleship construction due to its superiority in almost every important capability desired in a battleship, such as size of guns, survivability due to armor as well as a unique hull construction, and speed due to a new propulsion system. In a similar fashion the Nimitz-class supercarriers have far surpassed any other carriers in the world in their capabilities. The Nimitz-class supercarriers weigh in at almost 100,000 tons, outweighing almost all other carriers in the world by at least 50,000 tons with the lone exception of the Russian carrier the Admiral Kuznetsov which displaces 67,500 tons.³ This allows the supercarriers to load more bombs, fuel, and carry more aircraft, about 75 conventional takeoff and landing (CTOL) airplanes as well as helicopters, more than any other carrier in the world.⁴ By comparison the next largest air wing is on the French carrier, the Charles De Gaulle, which

carries about 43 aircraft.⁵ The capacity for aircraft combined with the size of the flight deck allows the supercarrier to employ a variety of aircraft including fighter/bombers as well as aircraft specialized in electronic warfare, ISR, and command and control operations; whereas smaller carriers will tend to load the aircraft that best supports the carrier's current mission. Also, the size and configuration of the flight deck allows for increased sortie rates due to the ability to launch and recover aircraft at the same time. The Nimitz-class also boasts a nuclear-powered propulsion system, which means that not only is it one of the fastest ships in the fleet, with top speeds above 30kts, but its ability to conduct missions is only limited by the amount of jet fuel, food, and munitions onboard. Not only can a supercarrier carry out the roles of a capital ship but it can have a much more significant effect on inland operations than could ever be imagined for battleships. This evidence firmly places the supercarrier in the category of the most powerful capital ship ever built or the leviathan of capital ships. However, unlike battleships which sparked naval arms races between nations and eventually led to naval arms limitation treaties, with varying levels of success, there has never been a race to produce the most carriers or the biggest carrier. The United States has dominated the arena of carrier construction since the end of World War II and no one has come close to challenging its supremacy. The effect of this buildup of carrier battle groups has been to crown the US Navy as the most powerful in the world, without a close second. Has the rest of the world lost interest in sea control? If the supercarrier is the preeminent modern capital ship why is the United States the only nation heavily invested in producing a fleet of them?

In the modern era of globalization and anti-imperialism many nations are finding that fielding a navy stocked with capital ships is neither required nor financially feasible. The resources required to build modern supercarriers (e.g. Nimitz-class) as well as their

accompanying fleets are beyond the capabilities of most nations. Not only is the cost prohibitive but most nations have little need of the capability to provide airpower to far flung places, as most nation's imperial possessions have long since been given their sovereignty back. Since World War II most conflicts have been confined to regional actors, with the exception of the United States, which has participated in many conflicts throughout the world during this time (Korea, Vietnam, Africa, Middle East, etc.). In a regional conflict airpower can usually be projected from land bases more easily and cheaply than from a carrier. However, unlike other nations, as the world's lone superpower the United States has taken on a role that requires frequent force projection in a variety of areas around the world. As a justification for the ten carrier strike groups in existence today many would argue that carriers are the best means of power projection available. Some have defended the carriers by citing the performance of carrier air wings by listing number of sorties, types of missions performed, and the importance of airpower in the wars in Iraq and Afghanistan as testaments to why supercarriers are the "credible power" of the US Navy.⁶ While there is no doubt the carrier air wings have played important roles in these conflicts it is hard to see, other than the opening days of each conflict, how the carriers fulfilled their role as a capital ship. It seems that if the squadrons of F/A-18s and other aircraft were transferred to secured airfields in or near Iraq and Afghanistan they would have been able to more effectively fulfill the same missions as well as avoid placing the nation's most expensive weapon system within range of the anti-ship missiles and submarines controlled by the openly hostile country of Iran.

Mahan emphasized clashes of capital ships concentrated in deep water as the epitome of naval warfare.⁷ However, this description was created based on several hundred years of ships-of-the-line fighting broadside to broadside to determine who the victor would be. Modern

warfare is characterized in a much more asymmetric fashion, including threats from anti-ship missiles and torpedoes both of which can be launched from aircraft, submarines, or surface combatants as well as land-based missiles that can threaten over a thousand miles out to sea from a coastline.⁸ These asymmetric threats place capital ships at great risk and are widely available to modern nations on the global arms-market. The proliferation of asymmetric threats coupled with a lack of nations willing to invest valuable resources into large capital ships means that Mahan's theory of capital ship engagements is no longer valid, furthermore, the modern capital ship, specifically supercarriers, are a wasteful and vulnerable concentration of resources, which should be replaced with smaller ships that are less concentrated targets and provide a more efficient use of limited resources. In an article entitled, *Capital Ship of the 21st Century*, Captain Wayne P. Hughes (ret) remarked that a carrier's vulnerability hasn't been tested in battle since 1945, but history shows that once battle is joined it is deadly.⁹ This goes to the heart of the argument against a force of supercarriers, in that they have never been battle tested, but once a naval battle ensues there will surely be losses. After losing even one supercarrier the reaction by military and civilian leadership will no doubt be to pull the remaining supercarriers back and protect them from further harm. Similar to how, during World War I, the British and German Dreadnoughts stared each other down across the North Sea, but were unable to have any significant effect on the war because of the propaganda espousing the Dreadnoughts as "unsinkable", which meant that to lose even one to a torpedo or mine was seen as too costly both psychologically and strategically.¹⁰ In fact the German emperor even went as far as ordering his admirals to avoid conflict in the North Sea for fear that they might lose a capital ship.¹¹ The limited number of supercarriers available and the fact that there is no other analogous weapon system in another nations order of battle means that the US Navy cannot risk losing a carrier in exchange for any

amount of damage dealt to the enemy because it will be viewed as a defeat, so it must protect the carriers at all costs. This strategic weakpoint has been exposed by the United States' enemies and they will try to exploit it in any future war.

The Threats

An adversary may pursue an asymmetric advantage on the tactical, operational, or strategic level by identifying key vulnerabilities and devising asymmetric concepts and capabilities to strike or exploit them.

-Joint Vision 2020

It is impossible to predict who the United States will fight in a future war but it is possible to look at worldwide developments in anti-access/area denial (A2AD) technology and see what the next naval war may look like. Nations, including potential adversaries such as Iran and China, have invested in advanced diesel submarines and anti-ship missile technology. These weapons systems are ideally suited to counteract the supercarrier's advantage in airpower and are significantly cheaper than producing or procuring their own aircraft carrier forces.

One clear example of using an asymmetric threat to put carriers at risk is China's development of the DF-21D an anti-ship ballistic missile (ASBM) capable of attacking large ships (i.e. aircraft carriers) at ranges in excess of 1000 nm. The ballistic trajectory, in which the missile essentially is launched into the upper atmosphere and then rains down onto the carrier, makes it very difficult to defend against and it is equipped with an advanced terminal guidance system and maneuverable warheads to increase the probability of a hit.¹² In conjunction with the DF-21D the Chinese will also employ several variants of anti-ship cruise missiles (ASCM), such as "the domestically produced ground- and ship-launched YJ-62 ASCM; the Russian SS-N-22/SUNBURN supersonic ASCM, which is fitted on China's SOVREMENNY-class guided missile destroyers; and the Russian SS-N-27B/SIZZLER supersonic ASCM on China's Russian-built KILO-class diesel-powered attack submarines."¹³ These ASCMs allow ships, submarines,

and aircraft to target carriers from a standoff range and keep carrier battle group defenses guessing which direction or platform the attack may come from. Besides attacks from missiles, the carrier must also be wary of torpedo attacks from stealthy submarines.

The current Chief of Naval Operations (CNO), Admiral Jonathan Greenert, acknowledged in a December of 2011 *Proceedings* article that enemy submarines are “potentially the most dangerous A2/AD capability”.¹⁴ China is a potential enemy looking to increase its A2/AD capabilities and has indigenously produced modern diesel and nuclear submarines. Besides long-range ASCMs these submarines are also equipped with advanced wire-guided wake-homing torpedoes.¹⁵ Carriers rely on anti-submarine warfare (ASW) aircraft and other screening vessels for defense against an undersea threat. However, the ability for these screening forces to protect the carrier is questionable at best. For example, during the Falklands crisis an inexperienced and poorly trained Argentinian submarine, the ARA San Luis, was able to successfully infiltrate an alerted British task force consisting of two ASW aircraft carriers, 15 frigates and destroyers including their embarked ASW aircraft, as well as several submarines. The San Luis conducted three torpedo attacks but due to correctable problems, technical issues and poor training, none of the attacks resulted in a hit. Even though the San Luis was not successful in sinking any ships it is informative to see the capabilities of a stealthy submarine when operating against an alerted ASW force equipped and trained to defeat an undersea threat but unable to do so, even against an inexperienced crew.¹⁶ For the screening forces protecting US supercarriers, they have the added disadvantage that they are typically only able to exercise against nuclear submarines as the US Navy has no diesel submarines in its order of battle. Nuclear submarines can simulate diesel submarines but they lack practice in the tactics employed by diesel submarines. Specifically, nuclear powered vessels do not plan operations around the

capacity of the battery like diesel subs are required to do. Also, because diesel subs are less expensive and more numerous they will generally take more risks in engagements than nuclear subs. US Navy leaders have from time to time lamented that that the ASW mission is a challenging area and outlined plans to upgrade the Navy's ASW capabilities; however, there is no silver bullet for defeating the undersea threat. As recently as 2006, the HMS Gotland, a Swedish diesel submarine on loan to the US Navy, was able to slip by the defenses protecting the USS Ronald Reagan and come within weapons range during an exercise.¹⁷ This example occurred in an exercise vice a wartime environment but if it is possible to defeat a carrier, either by sinking or significantly damaging, with one submarine then a strategy against an adversary such as China where a handful of supercarriers must operate in waters patrolled by dozens of submarines appears destined to fail. Furthermore, any operational plan assuming supercarriers are unassailable behind their fleet of screening vessels and will always be operational will be put in serious jeopardy should a supercarrier be put out of action. The number of sorties supplied by one carrier will be difficult to replace except by another carrier that may be thousands of miles away. Submarine threats to carriers are not limited to China. By some estimates, in 2011 as many as 38 countries had submarines in their naval order of battle.¹⁸ As arms-markets have become globalized, diesel submarine technology has become available to any nation willing to pay military manufacturers in countries such as Germany, Russia, or Sweden. However, for countries that still cannot afford a diesel submarine force they can always turn to the poor man's weapon of choice; the improvised explosive device.

The end of the Cold War brought about a shift in naval strategy from conducting blue water engagements to brown water conflicts where the US Navy would be charged with controlling the littorals. In littoral waters US Navy ships are much more exposed to smaller craft

that are unable to operate in an open ocean environment. Small inexpensive craft made out of wood or fiberglass such as trawlers, speed boats, and even jet skis can be armed with bombs, massed into large groups, and sent to explode their cargo on or near a warship. Large groups utilizing swarm tactics can overcome fleet defenses, especially, in the congested waters of an area like the Strait of Hormuz, one of the busiest straits in the world. A warship's ability to evade or simply maneuver away from small craft is hampered by shoal water, heavy shipping density, and the difficulty in detecting small nonmetal objects by radar. An attack utilizing high explosives, similar to the one against the USS Cole, may not significantly damage an aircraft carrier due to its thick armor but if a terrorist organization were to detonate a dirty bomb in the vicinity of an aircraft carrier the resulting cloud of radioactive particulate would coat the carrier's hull, flight deck, and hangar deck. This would effectively put the carrier out of commission for months or more as she would be required to be fully decontaminated before crewmen could safely work on the flight deck, which could not be done until a friendly port could be found that would take in a ship covered in radioactive particulate.

The Supercarrier Force: Asset or Overkill

We need to move from 'luxury-car' platforms -- with their built-in capabilities -- toward dependable 'trucks' that can handle a changing payload selection

- Admiral Jonathan W. Greenert, CNO

Proponents for supercarriers will often cite how when a crisis breaks out in some remote corner of the world the first question from the president is, "Where is the nearest carrier?" However, this provides little insight into the actual value of a supercarrier. As the most capable, flexible, and expensive tool available for the president it makes sense that he would look to use it even if its capabilities far exceed those required for the task. As an analogy, imagine if you found a nail that was partially protruding from your backyard deck and you had in your toolbox a ten

pound all stainless steel hammer, you would want to use that hammer because there is little chance you would damage it and using it would make you feel justified for the expense in purchasing such a hammer. Whereas, if all you had in your toolbox was a five pound steelheaded hammer with a wooden handle you would just as readily select that one as it could effectively do the same job as the stainless steel hammer. To find the value of the supercarrier an assessment must be made of what the supercarrier is costing the nation as compared to what alternatives, that can provide similar capabilities, would cost.

There are numerous reasons why the United States is the only nation in the world that sports a fleet of supercarriers and continues to build them even today. Some of these reasons include their enormous cost, the fact that airpower is not decisive in winning wars alone, and the lack of desire by most nations to project military power outside of a regional sphere of influence. The latter two reasons can be debated almost indefinitely, but the first reason and foremost reason why only one nation (with the largest defense budget on the planet) has a fleet of supercarriers is the cost to produce, maintain, and deploy them. Procurement costs for the USN's latest nuclear powered aircraft carrier, the Gerald R. Ford class, are about \$11.5 billion in FY2012 dollars, which does not include the cost for the air wing. These procurement costs have risen by over ten percent from the FY2009 to the FY2012 budget.¹⁹ Due to the immense cost of these ships and the budget restraints being experienced by the US government, the build cycle for the new class was increased from four to five-years. This shift will help spread costs out but have also increased per carrier costs such that the estimated cost for the third ship is \$13.5 billion in FY2018 dollars.²⁰ On top of the US Navy's increased cost estimates are scathing reports from the Congressional Budget Office (CBO) and the Governmental Accountability Office (GAO) indicating that costs for the new carriers will continue to rise citing that "seven of the CVN 21

[Ford-class] program's 13 current critical technologies have not been demonstrated in a realistic, at-sea environment."²¹ Investing this amount of taxpayer funds into a single platform will give any president pause if he knows he is sending it into harm's way. How would the public react if the face of US power projection, not to mention its 11 billion dollar price tag, is defeated in combat?

In his July 2012 article titled, *Payloads over Platforms: Charting a New Course*, Admiral Greenert emphasized building cheaper platforms that could handle different modular payloads and therefore be tailored for specific missions vice the platform having the integral capability to perform every mission and only utilizing some of its capabilities at any one time. Besides lowering costs for ships and aircraft, Greenert is also looking at the modern trends of increasing rates of technological innovation versus the increasing lead times in fielding new platforms.²² These long lead times means that ships are likely to include obsolete technology once they are completed, and therefore require modernization almost immediately. In the case of the Nimitz-class carriers they were designed over 35 years ago during the Cold War. They were designed to launch heavy jet fighter-bombers carrying tactical nuclear weapons for use against the Soviet Union. Obviously, this role has evolved since the end of the Cold War, but due to modernizations over the years the ship's center of gravity has worsened to the point where further increases in topside weight are unacceptable. Furthermore, the flight deck and weapons handling systems are not optimized for high sortie rate generation or handling modern smart weapons.²³ This means that the last of the Nimitz-class carriers the USS George H. W. Bush (CVN-77), which entered service in 2009 and is expected to have a 50 year service life is already obsolete in so far as it is designed to fight a war that ended over twenty years ago. Some might argue that the new Ford-class carriers will fix any issues in the design of the Nimitz-class. While

incorporating new technologies such as a new propulsion plant, a zonal electrical distribution system, and a new aircraft launch and recovery system into the Ford-class will undoubtedly improve its capabilities over the Nimitz-class, the question should be why are additional capabilities required for the world's most powerful warship and is the cost of a new leviathan capital ship worth the strategic value of such a ship.²⁴ For instance, the sortie generation rate for the Ford-class is expected to be 33 percent higher than what is possible on the Nimitz-class but with a cost estimate of 11.5 billion for the Gerald R. Ford (CVN-78) that would mean that it is over 50 percent costlier than the last Nimitz-class carrier, which cost 7 billion.²⁵ To use Greenert's analogy this appears to be trading in the Porsche for a new Lamborghini vice finding a "truck" for today's US Navy. Though, it is not hard to understand why the Navy continues to pursue supercarriers because for any organization it is difficult to abandon the things that are seen to bring the organization prestige and power, not to mention carriers have proven useful in many conflicts since World War II. For anyone wanting to convince the Navy or the US Government that supercarriers are a wasteful use of resources they face the same challenges as Billy Mitchell did when he fought to prove the battleship's obsolescence. It was almost impossible for Billy Mitchell to convince the US Government that the airplane would make the battleship obsolete even after proving an airplane could sink a battleship by dropping bombs on it. This was due in large part to the perceived dominance of big gun warships in the public's eye and the lobbying efforts of steel manufacturers, gun manufacturers, and shipyards, which had a lot to lose if the battleship should go out of production.²⁶ Hopefully, the US Navy will not wait until World War III to determine that supercarriers are relics of the past and should be replaced with something more innovative and more applicable to modern conflicts and budget restrictions.

Alternatives to Big-deck Supercarriers

A shrinking force structure, large, expensive legacy systems ill-suited to asymmetric warfare and an aging, depreciating industrial and technical base meant that the U.S. Navy found it increasingly difficult to respond to asymmetric opponents in the maritime commons.

-James Kraska
*How the United States Lost the Naval War
of 2015*

An alternative to a supercarrier must still be able to project power across the globe using some form of airpower. In general, alternatives will be smaller in size which will reduce cost, but will also reduce the number of aircraft that can be carried, the number of sorties that can be generated per day, and reduce the carrying capacity of fuel and armaments. Also, they will be conventionally powered, which will reduce costs but will require tanks for onboard fuel retention and reduce mobility when compared to a nuclear powered vessel. The following analysis of replacement options for the supercarrier fleet focuses on capabilities and procurement costs. Life cycle and support costs were not considered because they will vary depending on the manning, service life, maintenance costs, as well as the number of vessels produced to replace one supercarrier. However, these costs can be significant and can exceed procurement costs to long term Navy expenditures and should be factored into any decision to replace the supercarriers.²⁷ The first alternative uses a ship design already being built to support amphibious operations, the LHA(R) (Amphibious Landing Helicopter Assault) (Replacement).

The LHA(R) is designed to provide aviation support for amphibious landings and has been compared to the World War II era escort carriers, which came to fame by supporting amphibious assaults throughout the Pacific theatre of battle.²⁸ This ship would displace 40,000 tons, less than half as much as a Nimitz-class carrier, carry about 24 vertical and/or short take-off and landing (V/STOL) craft as well as helicopters and unmanned aerial vehicles (UAV). With an estimated procurement cost of \$2.7 billion, four LHA carriers could be purchased for one Ford-

class supercarrier.²⁹ The LHA carrier would also have facilities to support embarked troops, light vehicles, supplies, and large reconfigurable facilities dedicated to C4I.³⁰ A carrier with these capabilities can be configured for a vast array of missions, from air strike operations, insertion of special operating forces with close air support, forced entry, providing humanitarian assistance after a natural disaster strikes, or transporting forces and supplies. Given the versatility and flexibility of amphibious warfare ships it is no surprise that some countries are opting to project power using battle groups centered around them.³¹

Another more radical design features a small carrier with a catamaran hull that is designed to employ UAV/UCAVs and have a max speed of up to 60 knots. Designed by a team at Naval Postgraduate School the carrier, named Sea Archer, displaced only 13,500 tons, which would make it one of the smallest carriers in the world. Its notional air wing would comprise eight UCAVs (or manned VSTOL aircraft), ten reconnaissance UAVs, and 2 helicopters. It would require about eight of these small carriers to replace one supercarrier's air wing. With a procurement cost of \$1.5 billion only seven Sea Archers could be purchased for the price of one Ford-class supercarrier, however, with a minimum expected performance of 70 sorties per day it would only take two Sea Archers to exceed the sortie generation rates of the much larger Nimitz-class supercarrier.³²³³ The Sea Archer is maneuverable enough to evade many threats and by distributing airpower over many small platforms an enemy's targeting problem becomes that much more difficult. Small carriers also give the president more flexible options when dealing with hot spots that pop up. For instance, if a terrorist camp is the target it may only take a small force of one or two Sea Archers and some supporting surface ships as opposed to sending a supercarrier and only using a fraction of its air wing or if major combat operations are required,

then ten Sea Archers can be arrayed in a network to control a vast swath of ocean as opposed to concentrating forces around one supercarrier.

An even simpler solution would be to phase out the carrier battle groups altogether, especially since there hasn't been a need for carrier planes to carry tactical nuclear weapons for over twenty years. Instead of emphasis on concentrated airpower on one vessel at sea, the roles and capabilities of the carrier would be shifted to other US assets. The USAF could pick-up sorties that once were filled by the carrier, USAF aircraft have the same capabilities as those supplied by the carrier air wing with the exception of the EA-18G Growler's electronic warfare capabilities, which the Navy shares with the USAF. USAF fighters and bombers may be limited to land-based runways, but they can fly anywhere in the world with support from tankers. In addition to utilizing USAF assets the Navy could focus on employing standoff weapons. Even the CNO, Admiral Greenert, acknowledged that it is much cheaper to strike a target with a standoff weapon, such as a Tomahawk missile, as opposed to dropping a precision munition, such as a JDAM, on that same target.³⁴ Some have estimated that based on factors such as the cost for a pilot and life-cycle costs for the aircraft that it is almost four times more expensive to drop one precision bomb from an F/A-18 Hornet than it is to strike that target with a Tomahawk missile.³⁵ If this is the case it would seem more economical to shift striking power from carriers to ships and submarines loaded with standoff weapons, which are already in existence in today's fleet. Some would argue that without the "principle element of American sea power", (i.e. the carrier) the US Navy would not be able to accomplish its mission of sea control.³⁶ However, the ships and submarines in the US Navy are still the best in the world and as the only nation deploying capital ships it seems plausible that without a capital ship the rest of the fleet can still exercise sea control wherever and whenever it needs to. Until another nation attempts to

challenge the US Navy's ability to exercise sea control or decides to build and deploy its own capital ship the Navy could shift focus away from carrier battle groups to something more economical and flexible.

While none of these options will match the awe-inspiring sight of a supercarrier, they do provide other tangible benefits. Smaller ships have an advantage over supercarriers due their smaller crew sizes, shallower drafts, and non-nuclear powerplant which allows them to be homeported in more ports, potentially including ports of allies such as Singapore, Bahrain, or Italy.³⁷ Also, they can be forward deployed to US bases around the world such as Diego Garcia or Guam, which means they will be able to quickly close on any hot spot as well as decrease the number of ships needed to maintain one on deployment to something less than the three-to-one ratio that is required for carriers based in the United States. Another advantage for utilizing a smaller ship design is the availability of shipyards for ship production. There is a single point failure for production of supercarriers, in that there is only one shipyard that is capable of building them.³⁸ Smaller ships can be produced at several shipyards around the country, which would allow for faster replenishment of casualties during a conflict and work stoppage at one shipyard would not cease all production of a smaller ship as it could for a supercarrier. As budgets continue to shrink the US Navy must look for innovative ways to use limited resources and should focus on a fleet that can carry out the roles of a capital ship vice building capital ships that have been little more than expensive sea-based airfields used to project large amounts of airpower into landlocked countries.

Conclusion

The 65 years from Pearl Harbor to now have been a good run for the carriers. It is difficult, though, to expect any weapon system to dominate for as long as 65 years, especially when military technology has been changing markedly.

-Admiral Stansfield Turner (ret)
Aircraft Carriers are on Their Way Out

The US Navy has been projecting power around the globe without a significant naval challenger since the end of World War II. The carrier and her battle group epitomize the essence of what a capital ship should be. They can establish sea control in any region of the world, they can take another naval force head on, they can protect sea lines of communication, and they strike fear into the hearts of those that would defy the United States. Yet, just like the former preeminent capital ship, the battleship, there has been little to no Mahanian fleet-on-fleet engagements for command of the sea. In all of the major wars fought by the United States since World War II such as in Korea, Vietnam, Iraq, and Afghanistan, the United States has enjoyed absolute command of the seas. This brings into question whether capital ships have any place in modern warfare. Have other nations decided not to build supercarriers because they believe that it would be futile to compete with the United States? It is more likely that they have learned the lessons of the Dreadnought-class battleships. If a nation invests its riches into producing a weapon system that is proclaimed invincible then a new technology exposes a weakness in the weapon system, the nation cannot risk losing face and wasting the vast resources poured into the weapon and so the weapon will become nothing more than an empty promise of the nation's power or it will prove the demise of the nation because of the resources wasted in producing it. The ideology of building bigger and better capital ships should have died during World War II. The Japanese learned this lesson the hard way with the sinking of the superbattleship Yamato by US aircraft and the loss of the carrier Shinano (which had the distinction of being the largest

carrier in the world until 1955) which was sunk by US submarines in Japanese waters ten days after she went into service.³⁹ Anytime a weapon system is deemed valuable, enemies will strive to counter that weapon system and neutralize its advantages, no weapon system is invincible.

Supercarriers' concentration of firepower and strategic importance to US policy enforcement make them an obvious target for adversaries. Modern day threats to carriers include submarines, both diesel and nuclear-powered, which have proven effective at defeating warships from World War II through today. Modern cruise missiles are versatile threats that can be launched from a variety of platforms. Other threats include ballistic missiles and improvised explosive devices. Should one of these threats successfully sink or damage an 11 billion dollar supercarrier, then the enemy has effectively won. It is no different than when the arrow pierced the knight's armor, the cannon destroyed the castle, or when the airplane sunk the battleship. The US military has invested so many resources and relies so heavily on this one weapon system that to defeat one is to force the US military to rethink their entire strategy. However, until the vulnerability of supercarriers is proven, US policy makers will continue to rely on them.

Times have changed and supercarriers are no longer required to launch nuclear armed bombers against Soviet targets. The US Navy must take the lead on matching carrier capabilities to modern threats and contingencies. They should focus on developing alternatives that can project power in smaller increments around the globe rather than the lump sum solution of the supercarrier. If the Navy does not come up with possible solutions then budget restrictions or nervous politicians will make the choices for the Navy and the result may have long-term negative consequences in the Navy's traditional role as America's provider of power projection.

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- ¹ Hough, *Death of the Battleship*, 4.
- ² Hughes, "Capital Ship of the 21st Century", 52.
- ³ Globalsecurity.org, <http://www.globalsecurity.org/military/world/carriers.htm>.
- ⁴ O'Rourke, *Navy Ship Acquisition*, 8.
- ⁵ Globalsecurity.org, <http://www.globalsecurity.org/military/world/europe/cdg.htm>.
- ⁶ Grant et al, "Get the Carriers!".
- ⁷ Hoffman, "The Fleet We Need", 29.
- ⁸ Department of Defense, *Military and Security Developments Involving the People's Republic of China 2012*, 22.
- ⁹ Hughes, "Capital Ship of the 21st Century", 53.
- ¹⁰ Hough, *Dreadnought*, 138.
- ¹¹ Murray, "Naval Power in World War I", 193.
- ¹² Department of Defense, *Military Power of the People's Republic of China 2009*, 21.
- ¹³ Department of Defense, *Military and Security Developments Involving the People's Republic of China 2012*, 22..
- ¹⁴ Greenert, "Navy 2025: Forward Warfighters", Under Expanded (unmanned) Reach section.
- ¹⁵ Department of Defense, *Military Power of the People's Republic of China 2009*, vii.
- ¹⁶ VanYe, "Wishing Away the Problem", 7.
- ¹⁷ Taylor, "Pacing the Threat", 14.
- ¹⁸ Globalsecurity.org, <http://www.globalsecurity.org/military/world/ss-intro.htm>.
- ¹⁹ O'Rourke, *Navy Ford (CVN-78) Class Aircraft Carrier Program*, 5.
- ²⁰ Ibid., 3.
- ²¹ Ibid., 8.
- ²² Greenert, "Payloads Over Platforms".
- ²³ *Modernizing the U.S. Aircraft Carrier Fleet*, 1.
- ²⁴ Ibid., 78.
- ²⁵ Hendrix, *At What Cost a Carrier?*, 6.
- ²⁶ Hough, *Death of the Battleship*, 35.
- ²⁷ O'Rourke, *Navy Ship Acquisition*, 19.
- ²⁸ Annati, "Amphibious Flat-Decks", 58.
- ²⁹ O'Rourke, *Navy Ship Acquisition*, 9.
- ³⁰ Annati, "Amphibious Flat-Decks", 59.
- ³¹ Ibid., 61.
- ³² O'Rourke, *Navy Ship Acquisition*, 10.
- ³³ "Sea Archer", 18.
- ³⁴ Greenert, "Payloads Over Platforms".
- ³⁵ Hendrix, *At What Cost a Carrier?*, 7.
- ³⁶ Holloway, "CVN=Indispensable National Asset".
- ³⁷ O'Rourke, *Navy Ship Acquisition*, 25.
- ³⁸ Ibid., 26.
- ³⁹ Sullivan, *Supercarriers*, 68.

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