TESTIMONY OF

RONALD O'ROURKE

SPECIALIST IN NAVAL AFFAIRS

CONGRESSIONAL RESEARCH SERVICE

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HEARING ON

THE IMPLICATIONS OF CHINA'S NAVAL MODERNIZATION FOR THE UNITED STATES

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Chairman Bartholomew, Vice Chairman Wortzel, and Commissioners, thank you for the opportunity to appear today to discussion the implications of China's naval modernization effort for required U.S. Navy capabilities.

This testimony is drawn from the most recent (May 29, 2009) update to my Congressional Research Service (CRS) Report RL33153, *China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress*. This report was first published in November 2005 and has been updated more than 35 times since then. For convenience, this testimony uses the term China's naval modernization to refer to the modernization not only of China's navy, but also of Chinese military forces outside China's navy that can be used to counter U.S. naval forces operating in the Western Pacific, such as land-based anti-ship ballistic missiles (ASBMs).

Elements of China's Naval Modernization Effort

China's naval modernization effort encompasses a broad array of weapon acquisition programs, including programs for anti-ship ballistic missiles (ASBMs), anti-ship cruise missiles (ASCMs), land-attack cruise missiles (LACMs), surface-to-air missiles, mines, manned aircraft, unmanned aircraft, submarines, destroyers and frigates, patrol craft, amphibious ships and craft, mine countermeasures (MCM) ships, and supporting C4ISR systems. In addition, observers believe that China may soon begin an aircraft carrier construction program. China's naval modernization effort also includes reforms and improvements in maintenance and logistics, naval doctrine, personnel quality, education, and training, and exercises.

China's Naval Limitations and Weaknesses

Although China's naval modernization effort has substantially improved China's naval capabilities in recent years, observers believe China's navy continues to exhibit limitations or weaknesses in several areas, including capabilities for sustained operations by larger formations in distant waters, joint operations with other parts of China's military, C4ISR systems, anti-air warfare (AAW), antisubmarine warfare (ASW), MCM, and a dependence on foreign suppliers for certain key ship components.

Reasons for Modernization Effort

DOD and other observers believe that the near-term focus of China's military modernization effort, including its naval modernization effort, has been to develop military options for addressing the situation with Taiwan. Consistent with this goal, observers believe that China wants its military to be capable of acting as a so-called anti-access force – a force that can deter U.S. intervention in a conflict involving Taiwan, or failing that, delay the arrival or reduce the effectiveness of intervening U.S. naval and air forces. ASBMs, attack submarines, and supporting C4ISR systems are viewed as key elements of China's emerging anti-access force, though other force elements — such as ASCMs, LACMs (for attacking U.S. air bases and other facilities in the Western Pacific), and mines — are also of significance.

DOD and other observers believe that, in addition to the near-term focus on developing military

options relating to Taiwan, additional goals of China's naval modernization effort include improving China's ability to do the following:

- assert or defend China's claims in maritime territorial disputes and China's interpretation of international laws relating freedom of navigation in exclusive economic zones (an interpretation at odds with the U.S. interpretation);

- protect China's sea lines of communications to the Persian Gulf, on which China relies for some of its energy imports; and

- assert China's status as a major world power, encourage other states in the region to align their policies with China, and displace U.S. regional military influence.

The three additional goals above are potentially significant for at least three reasons. First, they imply that if the situation with Taiwan were somehow resolved, China could find continuing reasons to pursue its naval modernization effort.

Second, they would imply that if China completes its planned buildup of Taiwan-related naval force elements, or if the situation with Taiwan were somehow resolved, the composition of China's naval modernization effort could shift to include a greater emphasis on naval force elements that would be appropriate for supporting these additional goals, such as aircraft carriers, a larger number of nuclear-powered attack submarines, serial production of destroyers, underway replenishment ships, and overseas bases or support facilities.

Third, these additional goals suggest that even if China's military were never to engage in combat with an opposing military, China's military forces, including in particular its naval forces, would still be used on a day-to-day basis to promote China's political position in the Pacific. This would create an essentially political (as opposed to combat-related) reason for the United States or other countries to maintain a competitive presence in the region with naval and other forces that are viewed by observers in the Pacific as capable of effectively countering China's forces.

Selected Elements of China's Naval Modernization

Anti-Ship Ballistic Missiles (ASBMs). China is deploying large numbers of theater-range ballistic missiles capable of attacking targets in Taiwan or other regional locations. Although ballistic missiles in the past have traditionally been used to attack fixed targets on land, DOD and other observers believe China is developing anti-ship ballistic missiles (ASBMs), which are ballistic missiles equipped with maneuverable reentry vehicles (MaRVs) capable of hitting moving ships at sea. Observers have expressed strong concern about this development, because such missiles, in combination with broad-area maritime surveillance and targeting systems, would permit China to attack aircraft carriers and other U.S. Navy ships operating in the Western Pacific. The U.S. Navy has not previously faced a threat from highly accurate ballistic missiles capable of hitting moving ships at sea. Due to their ability to change course, MaRVs would be more difficult to intercept than non-maneuvering ballistic missile reentry vehicles.

Submarines. China's submarine modernization effort, which is producing a significantly more

modern and capable submarine force, has attracted substantial attention and concern. China by the end of 2006 completed taking delivery on eight Russian-made Kilo-class non-nuclear-powered attack submarines (SSs) that are in addition to four Kilos that China purchased from Russia in the 1990s. China also has recently built or is building four other classes of submarines, including the following:

- a new nuclear-powered ballistic missile submarine (SSBN) design called the Jin class or Type 094;
- a new nuclear powered attack submarine (SSN) design called the Shang class or Type 093;
- a new SS design called the Yuan class or Type 041 (or Type 039A); and
- another (and also fairly new) SS design called the Song class or Type 039/039G.

Along with the Kilo-class boats, these four classes of indigenous submarines are regarded as much more modern and capable than China's aging older-generation submarines. At least some of these new submarine designs are believed to have benefitted from Russian submarine technology and design know-how. China was projected to have a total of 28 relatively modern attack submarines — meaning Shang, Kilo, Yuan, and Song class boats — in commission by the end of 2007. Much of the growth in this figure occurred in 2004-2006.

Between 1995 and 2007, China placed into service a total of 38 submarines of all kinds, or an average of about 2.9 submarines per year. This average commissioning rate, if sustained indefinitely, would eventually result in a steady-state submarine force of 58 to 88 boats of all kinds, assuming an average submarine life of 20 to 30 years.

Excluding the 12 Kilo-class boats purchased from Russia, total number of domestically produced submarines placed into service between 1995 and 2007 is 26, or an average of 2.0 per year. This average rate of domestic production, if sustained indefinitely, would eventually result in a steady-state force of domestically produced submarines of 40 to 60 boats of all kinds, again assuming an average submarine life of 20 to 30 years.

Only three of the submarines placed into service between 1995 and 2007 are nuclear powered. If the mix of China's submarine-production effort shifts at some point to include a greater proportion of nuclear-powered boats, it is possible that the greater resources required to produce nuclear-powered boats might result in a reduction in the overall submarine production rate. If so, and if such a reduced overall rate were sustained indefinitely, it would eventually result in a smaller steady-state submarine force of all kinds than the figures calculated in the preceding two paragraphs.

China's submarines are armed with one or more of the following: ASCMs, wire-guided and wake-homing torpedoes, and mines. China's eight recently delivered Kilos are reportedly armed with the highly capable SS-N-27 Sizzler ASCM. In addition to other weapons, Shang-class SSNs may carry LACMs. Although ASCMs are often highlighted as sources of concern, wake-homing torpedoes can also be very difficult for surface ships to counter.

Each Jin-class SSBN is expected to be armed with 12 JL-2 nuclear-armed submarine-launched ballistic missiles (SLBMs). DOD estimates that these missiles will enter service in 2009 or 2010, and that they will have a range of 7,200 kilometers (about 3,888 nautical miles). Such a range could permit Jin-class SSBNs to attack:

- targets in Alaska (except the Alaskan panhandle) from protected bastions close to China;
- targets in Hawaii (as well as targets in Alaska, except the Alaskan panhandle) from locations south of Japan;
- targets in the western half of the 48 contiguous states (as well as Hawaii and Alaska) from mid-ocean locations west of Hawaii; and
- targets in all 50 states from mid-ocean locations west of Hawaii.

Aircraft Carriers. After years of debate and speculation on the issue, observers now believe that China may soon begin an aircraft carrier construction program. Observers believe that China may complete the unfinished ex-Russian carrier Varyag, which China purchased in 1998, and place it into service in the near future, possibly as an aviation training ship. Observers also believe that China may build one to six new carriers in coming years. Chinese officials have begun to talk openly about the possibility of China operating aircraft carriers in the future.

Observers have speculated on the potential size and capabilities of new-construction Chinese aircraft carriers. Given the technical challenges involved in building and operating carriers, China might elect to begin by building conventionally powered carriers of perhaps 40,000 to 70,000 tons displacement, and then progress to construction of larger and possibly nuclear-powered ships. The Varyag has an estimated full load displacement of about 58,500 tons.

Although aircraft carriers might have some value for China in Taiwan-related conflict scenarios, they are not considered critical for Chinese operations in such scenarios, because Taiwan is within range of land-based Chinese aircraft. Consequently, most observers believe that China would build and operate carriers primarily because of their value in other kinds of operations that are more distant from China's shores. Chinese aircraft carriers could be used for power-projection operations, particularly in scenarios that do not involve opposing U.S. forces. Chinese aircraft carriers could also be used for humanitarian assistance and disaster relief (HA/DR) operations, maritime security operations (such as anti-piracy operations), and non-combatant evacuation operations (NEOs). Politically, aircraft carriers could be particularly valuable to China for projecting an image of China as a major world power, because aircraft carriers are viewed by many as symbols of major world power status. In a combat situation involving opposing U.S. naval and air forces, Chinese aircraft carriers would be highly vulnerable to attack by U.S. ships and aircraft, but conducting such attacks could divert U.S. ships and aircraft from performing other missions in a conflict situation with China.

Surface Combatants. China since the early 1990s has purchased four Sovremenny-class destroyers from Russia and deployed nine new classes of indigenously built destroyers and

frigates (some of which are variations of one another) that demonstrate a significant modernization of China's surface combatant technology. China to date has commissioned only 1 or 2 ships in each of its five new destroyer classes, suggesting that at least some of these classes might have been intended to serve as stepping stones in a plan to modernize the China's surface combatant technology incrementally before committing to larger-scale series production of destroyers. If one or more of these destroyer designs (or a successor design) are put into larger-scale production, it would accelerate the modernization of China's surface combatant force. Unlike the new destroyer designs, some of the four new frigate designs have been put into larger-scale series production. China has also deployed in significant numbers a new kind of missile-armed fast attack craft that uses a stealthy catamaran hull design.

Amphibious Ships. China has built the lead ship of a new class of amphibious ships called the Yuzhao or Type 071 class. The design has an estimated displacement of 17,600 tons. Some observers believe that China might build a total of four to six Type 071 ships. China reportedly might also begin building a larger amphibious ship, called the Type 081 LHD, that might displace about 20,000 tons. Some observers believe China may build a total of three or more Type 081s. Although larger amphibious ships such as the Type 071 and the Type 081 might have some value for conducting amphibious landings in Taiwan-related conflict scenarios, some observers believe that China would build and operate such ships more for their value in conducting other kinds of operations that are more distant from China's shores. Larger amphibious ships can be used for conducting not only amphibious landings, but for HA/DR operations, maritime security operations (such as anti-piracy operations), and NEOs.

Maritime Surveillance and Targeting Systems. China reportedly is developing or deploying maritime surveillance and targeting systems that can detect U.S. ships and submarines and provide targeting information for Chinese ASBMs and other Chinese military units. These systems reportedly include land-based over-the-horizon backscatter (OTH-B) radars, land-based over-the-horizon surface wave (OTH-SW) radars, electro-optical satellites, radar satellites, and seabed sonar networks.

Operations Away From Home Waters. Chinese navy ships in recent years have begun to conduct operations away from China's home waters. Although many of these operations have been for making diplomatic port calls, some of them have been for other purposes, including, for example, anti-piracy operations near Somalia.

Comparing U.S. and Chinese Naval Capabilities

U.S. and Chinese naval capabilities are sometimes compared by showing comparative numbers of U.S. and Chinese ships. Although numbers of ships can be relatively easy to compile from published reference sources, comparisons of such figures are highly problematic as a means of assessing relative U.S. and Chinese naval capabilities, for the following reasons:

- A fleet's total number of ships (or its aggregate tonnage) is only a partial metric of its capability. Other important factors contributing to a navy's capability include types of ships; types and numbers of aircraft; the sophistication of sensors, weapons, C4ISR systems, and networking capabilities; supporting maintenance and logistics capabilities; doctrine and tactics; the quality,

education, and training of personnel; and the realism and complexity of exercises. Given these other significant contributors to naval capability, navies with similar numbers of ships or similar aggregate tonnages can have significantly different capabilities, and navy-to-navy comparisons of numbers of ships or aggregate tonnages can provide a highly inaccurate sense of their relative capabilities.

- Total numbers of ships of a given type (such as submarines, destroyers, or frigates) can obscure potentially significant differences in the capabilities of those ships, both between navies and within one country's navy. Differences in capabilities of ships of a given type can arise from differences in factors such as sensors, weapons, C4ISR systems, networking capabilities, stealth features, damage-control features, cruising range, maximum speed, and reliability and maintainability (which can affect the amount of time the ship is available for operation). The potential for obscuring differences in the capabilities of ships of a given type is particularly significant in assessing relative U.S. and Chinese capabilities, in part because China's navy includes significant numbers of older, obsolescent ships. Figures on total numbers of Chinese submarines, destroyers, and frigates lump older, obsolescent ships together with more modern and more capable designs.

- A focus on total ship numbers reinforces the notion increases in total numbers necessarily translate into increases in aggregate capability, and that decreases in total numbers necessarily translate into decreases in aggregate capability. For a Navy like China's, which is modernizing in some ship categories by replacing larger numbers of older, obsolescent ships with smaller numbers of more modern and more capable ships, this is not necessarily the case. China's submarine force, for example, has decreased in total numbers, but has increased in aggregate capability, because larger numbers of older, obsolescent boats have been replaced by smaller numbers of more modern and more capable boats. For assessing navies like China's, it can be more useful to track the growth in numbers of more modern and more capable units.

- Comparisons of numbers of ships (or aggregate tonnages) do not take into account maritime-relevant capabilities that countries might have outside their navies, such as land-land-based anti-ship ballistic missiles (ASBMs), land-based anti-ship cruise missiles (ASCMs), and land-based air force aircraft armed with ASCMs. This is a particularly important consideration in comparing U.S. and Chinese military capabilities for influencing events in the Western Pacific.

- The missions to be performed by one country's navy can differ greatly from the missions to be performed by another country's navy. Consequently, navies are better measured against their respective missions than against one another. This is another significant consideration in assessing U.S. and Chinese naval capabilities, because the missions of the two navies are quite different.

China as a Defense-Planning Priority in the QDR

In the debate over future U.S. defense spending, including deliberations taking place in the current Quadrennial Defense Review (QDR), a key issue is how much emphasis to place on programs for countering improved Chinese military forces in coming years. The question of how much emphasis to place in U.S. defense planning on programs for countering improved Chinese military forces is of particular importance to the U.S. Navy, because many programs associated with countering improved Chinese military forces would fall within the Navy's budget. In terms of potential impact on programs and spending, the Navy might have more at stake on this issue than the Army and Marine Corps, and perhaps at least as much, if not more, than the Air Force.

Statements from Secretary of Defense Robert Gates and other DOD officials suggest that the QDR may place a relatively strong emphasis on programs for supporting current combat operations in Iraq and Afghanistan, as well as programs for conducting irregular warfare (e.g., counterinsurgency operations) in coming years, and relatively less emphasis on programs relating to possible conventional conflicts between states. This has suggested to some supporters that the QDR may place relatively less emphasis on, among other things, programs for countering improved Chinese military forces in coming years.

Those who argue that relatively less emphasis should be placed on programs for countering improved Chinese military forces in coming years could argue one or more of the following:

- Preparing for a potential conflict over Taiwan years from now might be unnecessary, since the situation with Taiwan might well be resolved by then.

- It is highly unlikely that China and the United States will come to blows in coming years over some other issue, due to the deep economic and financial ties between China and the United States and the tremendous damage such a conflict could inflict.

- Placing a strong emphasis on programs for countering improved Chinese military forces could induce China to increase planned investments in its own naval forces, leading to an expensive U.S.-China naval arms race.

- Far from coming to blows, Chinese and U.S. naval forces in coming years can and should cooperate in areas of common interest such as HA/DR operations, anti-piracy operations, and other maritime-security operations.

Those who argue that relatively more emphasis should be placed on programs for countering improved Chinese military forces in coming years could argue one or more of the following:

- Not preparing for a potential conflict over Taiwan years from now could make such a conflict more likely by emboldening China to use military force to attempt to achieve its goals regarding Taiwan. It might also embolden China to use its naval forces more aggressively in asserting its maritime territorial claims and its interpretation of international laws relating freedom of navigation in exclusive economic zones (an interpretation at odds with the U.S. interpretation).

- China's naval modernization effort may be driven more by internal Chinese factors than by external factors such as U.S. decisions on defense spending. To the extent that China's naval modernization effort might be influenced by U.S. decisions on defense spending, a decision to not emphasize programs for countering improved Chinese military forces might encourage China to continue or even increase its naval modernization effort out of a belief that the effort is succeeding in terms of dissuading U.S. leaders from taking steps to prevent a shift in China's favor in the balance of military forces in the Western Pacific.

- Even if China and the United States never come to blows with one another, maintaining a day-to-day presence in the Pacific of U.S. naval forces capable of successfully countering Chinese naval forces will be an important U.S. tool for shaping the region-that is, for ensuring that other countries in the region do not view China as the region's emerging military leader (or the United States as a fading military power in the region), and respond by either aligning their policies more closely with China or taking steps to improve their own military capabilities that the United State might prefer they not take, such as developing nuclear weapons.

- Placing a relatively strong emphasis on programs for countering improved Chinese military forces does not preclude cooperating with China in areas such as HA/DR operations, anti-piracy operations, and other maritime-security operations.

Potential Navy-Related Program Implications

Potential Implications in General. A decision to place a relatively strong defense-planning emphasis on countering improved Chinese military forces in coming years could lead to one more of the following:

- increasing activities for monitoring and understanding developments in China's navy, as well as activities for measuring and better understanding operating conditions in the Western Pacific;

- assigning a larger percentage of the Navy to the Pacific Fleet (and, as a result, a smaller percentage to the Atlantic Fleet);

- homeporting more of the Pacific Fleet's ships at forward locations such as Hawaii, Guam, and Japan;

- increasing training and exercises in operations relating to countering Chinese maritime anti-access forces, such as antisubmarine warfare (ASW) operations;

- placing a relatively strong emphasis on programs for developing and procuring highly capable ships, aircraft, and weapons for defeating Chinese anti-access systems.

Actions Already Taken. The U.S. Navy and (for sea-based ballistic missile defense programs) the Missile Defense Agency (MDA) have taken a number of steps in recent years that appear intended, at least in part, at improving the U.S. Navy's ability to counter Chinese maritime anti-access capabilities, including but not limited to the following:

- increasing antisubmarine warfare (ASW) training for Pacific Fleet forces;
- shifting three Pacific Fleet Los Angeles (SSN-688) class SSNs to Guam;
- basing all three Seawolf (SSN-21) class submarines — the Navy's largest and most heavily armed SSNs — in the Pacific Fleet (at Kitsap-Bremerton, WA);
- basing two of the Navy's four converted Trident cruise missile/special operations forces submarines (SSGNs) in the Pacific (at Bangor, WA);
- assigning most of the Navy's ballistic missile defense (BMD)-capable Aegis cruisers and destroyers to the Pacific - and homeporting some of those ships at Yokosuka, Japan, and Pearl Harbor, HI;
- increasing the planned procurement quantity of SM-3 BMD interceptor missiles;
- developing and procuring a sea-based terminal-defense BMD capability as a complement to the Aegis BMD midcourse BMD capability; and
- expanding the planned number of BMD-capable ships from three Aegis cruisers and 15 Aegis destroyers to more than three Aegis cruisers and all Aegis destroyers.

In addition, the Navy's July 2008 proposal to stop procurement of Zumwalt (DDG-1000) class destroyers and resume procurement of Arleigh Burke (DDG-51) class Aegis destroyers can be viewed as having been prompted in large part by Navy concerns over its ability to counter China's maritime anti-access capabilities. The Navy stated that this proposal was driven by a change over the last two years in the Navy's assessment of threats that U.S. Navy forces will face in coming years from ASCMs, ballistic missiles, and submarines operating in blue waters. Although the Navy in making this proposal did not highlight China by name, the Navy's references to ballistic missiles and to submarines operating in blue waters can be viewed, at least in part, as a reference to Chinese ballistic missiles (including ASBMs) and Chinese submarines. (In discussing ASCMs, the Navy cited a general proliferation of ASCMs to various actors, including the Hezbollah organization.)

Highly Capable Ships and Aircraft. An emphasis on acquiring highly capable ships could involve maintaining or increasing funding for procurement of aircraft carriers, attack submarines, and cruisers and destroyers. Capabilities to emphasize in procurement of cruisers and destroyers would include BMD, AAW, and ASW. An emphasis on procuring highly capable aircraft could involve maintaining or increasing funding for a variety of naval aviation acquisition programs, including F/A-18E/F Super Hornet and F-35C strike fighters, EA-18G Growler electronic attack

aircraft, E-2D Hawkeye early warning and command and control aircraft, the P-8A Multi-mission Maritime Aircraft (MMA), and the Navy's Unmanned Combat Air System (UCAS program) program.

Pacific Fleet's Share of the Navy. The final report on the 2005 Quadrennial Defense Review (QDR) directed the Navy "to adjust its force posture and basing to provide at least six operationally available and sustainable carriers and 60% of its submarines in the Pacific to support engagement, presence and deterrence." The Navy will meet the 2005 QDR directive of having six CVNs in the Pacific when the Carl Vinson (CVN-70) — the CVN currently undergoing a mid-life refueling complex overhaul (RCOH) at Newport News, VA — completes its RCOH and post-delivery work and is then shifted to San Diego.

As of February 2009, 52% or 53% of the Navy's submarines (depending on whether SSBNs are included in the calculation) were homeported in the Pacific. The Navy can achieve the 2005 QDR directive of having 60% of its submarines in the Pacific by assigning newly commissioned submarines to the Pacific, by moving submarines from the Atlantic to the Pacific, by decommissioning Atlantic Fleet submarines, or through some combination of these actions. According to one 2008 press report, the Navy plans to have 60% of its SSNs in the Pacific Fleet by 2010.As part of a "strategic laydown analysis" that the Navy performed in support of its January 2009 proposal to transfer a nuclear-powered aircraft carrier (CVN) to Mayport, FL, the Navy projected that of its planned 313-ship fleet, 181 ships, or 58% (including six of 11 CVNs), would be assigned to the Pacific Fleet.

Homeporting Pacific Fleet Ships in Forward Locations. Navy ships homeported in Japan include an aircraft carrier strike group consisting of a CVN and 11 cruisers, destroyers, and frigates; an amphibious ready group consisting of three amphibious ships; and additional mine countermeasures ships. Navy ships homeported at Guam include three Los Angeles (SSN-688) class attack submarines and a submarine tender. Navy ships homeported in Hawaii include 15 Virginia (SSN-774) and Los Angles class SSNs, and 11 cruisers, destroyers, and frigates. A 2002 Congressional Budget Office (CBO) report discussed the option of homeporting as many as 11 SSNs at Guam.

Fleet Architecture -- Larger vs. Smaller Ships. Some observers, viewing the anti-access aspects of China's naval modernization effort, including ASBMs, ASCMs, and other anti-ship weapons, have raised the question of whether the U.S. Navy should respond by shifting over time to a more highly distributed fleet architecture featuring a reduced reliance on carriers and other large ships and an increased reliance on smaller ships. The question of whether the U.S. Navy concentrates too much of its combat capability in a relatively small number of high-value units, and whether it should shift over time to a more highly distributed fleet architecture, has been debated at various times over the years, in various contexts. Much of the discussion concerns whether the Navy should start procuring smaller aircraft carriers as complements or replacements for its current large aircraft carriers.

Chairman Bartholomew, distinguished members of the commission, this concludes my testimony. Thank you again for the opportunity to appear before you to discuss these issues. I will be pleased to respond to any questions you might have.

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