



China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress

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April 24, 2009

Congressional Research Service

7-5700

www.crs.gov

RL33153

Summary

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. Observers disagree on the issue, with some arguing that such programs should receive significant emphasis, others arguing that they should receive relatively little, and still others taking an intermediate position. 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.

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, aircraft, submarines, destroyers and frigates, patrol craft, and amphibious ships. 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. 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.

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. 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.

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; 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; and placing a relatively strong emphasis on programs for developing and procuring highly capable ships, aircraft, and weapons. This report will be updated as events warrant.

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Introduction

Issue for Congress

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. Observers disagree on the issue, with some arguing that such programs should receive significant emphasis, others arguing that they should receive relatively little, and still others taking an intermediate position.

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. Decisions that policymakers make on the issue of how much emphasis to place on programs for countering improved Chinese military forces could significantly affect the future size, composition, and capabilities of the Navy; Navy funding requirements; and the shipbuilding industrial base.

Scope, Sources, and Terminology

This report focuses on the potential implications China's naval modernization for future required U.S. Navy capabilities. Other CRS reports address separate issues relating to China.

This report is based on unclassified open-source information, such as the annual Department of Defense (DOD) report to Congress on China's military power,¹ and published reference sources such as *Jane's Fighting Ships*.

For convenience, this report 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), land-based surface-to-air missiles (SAMs), land-based air force aircraft armed with anti-ship cruise missiles (ASCMs), and land-based long-range radars for detecting and tracking ships at sea.

China's military is formally called the People's Liberation Army, or PLA. Its navy is called the PLA Navy, or PLAN, and its air force is called the PLA Air Force, or PLAAF. The PLA Navy includes an air component that is called the PLA Naval Air Force, or PLANAF. China refers to its ballistic missile force as the Second Artillery Force.

¹ U.S. Department of Defense, *Annual Report to Congress [on] Military Power of the People's Republic of China 2009*. Washington, 2009. (Hereafter *2009 DOD CMP*. Editions for earlier years cited similarly.)

Background

Overview of China's Naval Modernization²

Date of Inception

Observers date the beginning of China's naval modernization effort to various points in the 1990s.³ Design work on some of China's newer ship classes appears to have begun in the later 1980s.⁴ Some observers believe that China's naval modernization effort may have been reinforced or accelerated by a 1996 incident in which the United States deployed two aircraft carrier strike groups to waters near Taiwan in response to Chinese missile tests and naval exercises near Taiwan.

Elements of 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 C4ISR⁵ systems. In addition, observers believe that China may soon begin an aircraft carrier construction program. Some of these acquisition programs have attracted particular interest and are discussed in further detail below. China's naval modernization effort also includes reforms and improvements in maintenance and logistics, naval doctrine, personnel quality, education, and training, and exercises.

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. DOD states that

² Unless otherwise indicated, shipbuilding program information in this section is taken from *Jane's Fighting Ships 2008-2009*, and previous editions. Other sources of information on these shipbuilding programs may disagree regarding projected ship commissioning dates or other details, but sources present similar overall pictures regarding PLA Navy shipbuilding.

³ China ordered its first four Russian-made Kilo-class submarines in 1993, and its four Russian-made Sovremenny-class destroyers in 1996. China laid the keel on its first Song (Type 039) class submarine in 1991, its first Luhu (Type 052) class destroyer in 1990, its Luhai (Type 051B) class destroyer in 1996, and its first Jiangwei I (Type 053 H2G) class frigate in 1990.

⁴ First-in-class ships whose keels were laid down in 1990 or 1991 (see previous footnote) likely reflect design work done in the latter 1980s.

⁵ C4ISR stands for command and control, communications, computers, intelligence, surveillance, and reconnaissance.

As China's capabilities for local and regional operations have increased in certain areas since 2000, a number of limitations appear to have persisted. The PLA has developed new doctrine for joint warfighting and implemented organizational changes, such as including service commanders on the Central Military Commission, to facilitate the transition to a more "joint" force. However, joint integration still lags. Similarly, PLA air and amphibious lift capacity has not improved appreciably since 2000 when the Department of Defense assessed the PLA as capable of sealift of one infantry division. Likewise, China's current ability to deliver about 5,000 parachutists in a single lift (less if equipment is carried at the same time) is similar to previous assessments. China's at-sea replenishment has improved with experience since 2000, but the PLA Navy today remains limited by a small number of support vessels – much as it did then. In 2000, the Department of Defense projected aerial refueling as an operational capability by 2005. Today, while China has a few aerial refueling aircraft, it does not have the number of tankers, properly equipped combat aircraft, or sufficient training to employ this capability for power projection.⁶

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 disputes⁷ 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

⁶ 2009 DOD CMP, p. viii.

⁷ For more on this topic, see CRS Report RL31183, *China's Maritime Territorial Claims: Implications for U.S. Interests*, by Kerry Dumbaugh et al.

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 missiles⁸ 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. DOD states that:

China is developing an ASBM based on a variant of the CSS-5 MRBM [medium-range ballistic missile] as a part of its anti-access strategy. The missile has a range in excess of 1,500 km, is armed with a maneuverable warhead, and when incorporated into a sophisticated command and control system, is intended to provide the PLA the capability to attack ships at sea, including aircraft carriers in the western Pacific Ocean.⁹

Anti-Ship Cruise Missiles (ASCMs)

Among the most capable of the new ASCMs that have been acquired by the PLA Navy are the Russian-made SS-N-22 Sunburn (carried by China's four Russian-made Sovremenny-class destroyers) and the SS-N-27 Sizzler (carried by 8 of China's 12 Russian-made Kilo-class submarines). China's large inventory of ASCMs also includes several indigenous designs.

⁸ Depending on their ranges, these theater-range ballistic missiles can be divided into short-, medium-, and intermediate-range ballistic missiles (SRBMs, MRBMs, and IRBMs, respectively).

⁹ 2009 DOD CMP, p. 48. See also p. 21.

Submarines

Types Acquired in Recent Years

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;¹⁰
- a new SS design called the Yuan class or Type 041 (or Type 039A);¹¹ 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'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.

Although China's aging Ming-class (Type 035) submarines are based on old technology and are much less capable than China's newer-design submarines, China may decide that these older boats have continued value as minelayers or as bait or decoy submarines that can be used to draw out enemy submarines (such as U.S. SSNs) that can then be attacked by more modern PLA Navy submarines.

Submarine Acquisition Rate and Potential Submarine Force Size

Table 1 shows actual and projected commissionings of Chinese submarines by class since 1995, when China took delivery of its first two Kilo-class boats. The table includes the final nine boats in the Ming class, which is an older and less capable submarine design. As shown in **Table 1**, China was projected to have a total of 28 relatively modern attack submarines – meaning Shang,

¹⁰ Some sources state that a successor to the Shang class SSN design, called the Type 095 SSN design, is in development.

¹¹ Some observers believe the Yuan class to be a variant of the Song class and refer to the Yuan class as the Type 039A.

Kilo, Yuan, and Song class boats – in commission by the end of 2007. As shown in the table, much of the growth in this figure occurred in 2004-2006.

The figures in **Table 1** show that 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 Kilos 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.

As shown in **Table 1**, 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.

Photos published on the Internet have suggested to some observers that China has launched and perhaps completed (if perhaps not officially placed into service) higher numbers of Jin-, Shang-, and Yuan-class submarines than shown in **Table 1**.

Table I. PLA Navy Submarine Commissionings

Actual (1995-2006) and Projected (2007-2010)

	Jin (Type 094) SSBN	Shang (Type 093) SSN	Kilo SS (Russian -made)	Yuan (Type 041) SS ^a	Song (Type 039) SS	Ming (Type 035) SS ^b	Annual total	Cumu- lative total for all types shown	Cumu- lative total for modern attack boats ^c
1995			2 ^d			1	3	3	2
1996						1	1	4	2
1997						2	2	6	2
1998			1 ^d			2	3	9	3
1999			1 ^d		1		2	11	5
2000						1	1	12	5
2001					2	1	3	15	7
2002						1	1	16	7
2003					2		2	18	9
2004			1		3		4	22	13
2005			4		3		7	29	20
2006		1	3	1	2 ^e		7	36	27
2007	1	1					2	38	28
2008		n/a ^f					n/a	n/a	n/a
2009	1 ^g	n/a ^f		1			n/a	n/a	n/a
2010		n/a ^f		1			n/a	n/a	n/a
2011	1 ^g	n/a ^f		n/a			n/a	n/a	n/a
2012		n/a ^f		n/a			n/a	n/a	n/a
2013	1 ^g	n/a ^f		n/a			n/a	n/a	n/a
2014		n/a ^f		n/a			n/a	n/a	n/a

Source: *Jane's Fighting Ships 2008-2009*, and previous editions.

Note: n/a = data not available.

- Some observers believe the Yuan class to be a variant of the Song class and refer to the Yuan class as the Type 039A.
- Figures for Ming-class boats are when the boats were launched (i.e., put into the water for final construction). Actual commissioning dates for these boats may have been later.
- This total excludes the Jin-class SSBNs and the Ming-class SSs.
- First four boats, commissioned in the 1990s, are to be refitted in Russia; upgrades are likely to include installation of SS-N-27 ASCM.
- No further units expected after the 12th and 13th shown for 2006.

- f. A total of five Type 093 boats has been expected, but *Jane's Fighting Ships 2008-2009* states that production of the two Type 093 boats shown in the table may be followed by production of a modified evolutionary SSN design possibly known as the Type 095 class.
- g. A total of five or six boats is expected, with boats entering service at two-year intervals. (DOD stated in 2008 that up to five might be built. [2008 DOD CMP, p. 25])

JL-2 SLBM on Jin-Class SSBN

Each Jin-class SSBN is expected to be armed with 12 JL-2 nuclear-armed submarine-launched ballistic missiles (SLBMs).¹² DOD estimates that these missiles will enter service in 2009 or 2010,¹³ and that they will have a range of 7,200 kilometers (about 3,888 nautical miles).¹⁴ Such a range could permit Jin-class SSBNs to attack

- targets in Alaska (except the Alaskan panhandle) from protected bastions close to China;¹⁵
- 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. China reportedly has begun training its first 50 fixed-wing carrier aviators, has been in negotiations with Russia to purchase up to 50 Russian-made carrier-capable Su-33 fighter aircraft, and may be developing indigenous carrier-capable fighters. DOD states that:

China has an active aircraft carrier R&D [research and development] program. The PRC shipbuilding industry could start construction of an indigenous platform by the end of this

¹² 2009 DOD CMP, p. 24.

¹³ 2009 DOD CMP, pp. 24 and 48.

¹⁴ 2009 DOD CMP, p. 25 (Figure 6), 48, and 66 (Figure 22).

¹⁵ A map published by DOD (2009 DOD CMP, p. 25 [Figure 6]) shows a range ellipse for the JL-2 which, upon inspection, appears to show the missile as having a range of no more than about 6,600 kilometers, rather than the 7,200 kilometers indicated in the legend to the map and elsewhere in the DOD report. In addition, the JL-2 range ellipse appears centered on a launching point that is more or less west of Shanghai and perhaps 200 statute miles inland from the sea. This combination of apparent range and launching point appears to be why the map shows the JL-2 as having sufficient range to attack only the western half of the Aleutian island chain and perhaps the western coast of mainland Alaska (the section of Alaska's coast that is directly opposite the Russian coast). A similar map appeared in the 2008 DOD CMP. A missile with a range of 7,200 kilometers that is launched from an ocean location close to China's eastern coast would have sufficient range to attack all of Alaska except the Alaskan panhandle.

decade. China may be interested in building multiple operational aircraft carriers with support ships in the next decade.

The PLA Navy has reportedly decided to initiate a program to train 50 pilots to operate fixed-wing aircraft from an aircraft carrier. The initial program, presumably land-based, would be followed in about four years by ship-borne training involving the ex-VARYAG, which was purchased by a Chinese company from Ukraine in 1998.¹⁶

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. Some observers have speculated that China's first aircraft carriers might displace between 60,000 and 70,000 tons. The Varyag has an estimated full load displacement of about 58,500 tons.

A carrier with a displacement closer to 40,000 tons would be capable of operating a modest number of VSTOL (vertical/short takeoff and landing) aircraft, but would not likely be able to operate CTOL (conventional takeoff and landing) airplanes. A carrier with a displacement closer to 70,000 tons could support a larger air wing, and would more likely be able to operate CTOL airplanes. For comparison, the U.S. Navy's LHA/LHD-type amphibious assault ships, which resemble medium-sized aircraft carriers, displace roughly 40,000 tons and are limited to VSTOL aircraft operations. The Navy's Midway (CV-41), Forrestal (CV-59), and Kitty Hawk (CV-63) class conventionally powered carriers, none of which is still in service, had displacements of 69,000 to 85,000 tons, and could operate large numbers of CTOL airplanes. The Navy's current

¹⁶ 2009 DOD CMP, pp. 48-49. In another part of the report (page 40), DOD states:

China has an aircraft carrier research and design program, which includes continued renovations to the former Soviet Kuznetsov-class aircraft carrier VARYAG. Beginning in early 2006 with the release of China's Eleventh Five Year Plan, PRC-owned media reported high-level government and military official statements on China's intent to build aircraft carriers. In December 2008, China's Ministry of National Defense spokesman Senior Colonel Huang Xueping said "China has vast oceans and it is the sovereign responsibility of China's armed forces to ensure the country's maritime security and uphold the sovereignty of its coastal waters as well as its maritime rights and interests," and added that China is "seriously considering" adding an aircraft carrier to its fleet, because "the aircraft carrier is a symbol of a country's overall national strength, as well as the competitiveness of the country's naval force." This was preceded by a November 2008 statement by the Director of the Ministry of National Defense, Foreign Affairs Office, Major General Qian Lihua, that "having an aircraft carrier is the dream of any great military power," and "the question is not whether you have an aircraft carrier, but what you do with your aircraft carrier."

China continues to show interest in procuring Su-33 carrier-borne fighters from Russia even though the ex-VARYAG aircraft carrier has yet to complete refurbishment at Dalian shipyard. In October 2006, a Russian press report suggested early-stage negotiations were underway for China to purchase up to 50 such aircraft at a cost of \$2.5 billion. However, there has been no announcement of a contract for the aircraft.

The PLA Navy has reportedly decided to initiate a program to train 50 navy pilots to operate fixed-wing aircraft from an aircraft carrier. The program was reported to be four years long and would be followed by ship-borne training involving the ex-VARYAG. Analysts in and out of government project that China will not have an operational, domestically-produced carrier and associated ships before 2015. However, changes in China's shipbuilding capability and degree of foreign assistance to the program could alter those projections. The PLA Navy is considering building multiple carriers by 2020.

Nimitz (CVN-68) class nuclear-powered aircraft carriers displace about 100,000 tons and can operate large numbers of CTOL airplanes.¹⁷

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 PLA Navy surface combatant technology. China has also deployed a new kind of missile-armed fast attack craft that uses a stealthy catamaran hull design.

Sovremenny-Class Destroyers

China in 1996 ordered two Sovremenny-class destroyers from Russia; the ships entered service in 1999 and 2001. China in 2002 ordered two additional Sovremenny-class destroyers from Russia; the ships entered service in 2005 and 2006. Sovremenny-class destroyers are equipped with the SS-N-22 Sunburn ASCM, a highly capable ASCM. DOD stated in 2007 that the two ships delivered in 2005-2006 "are fitted with anti-ship cruise missiles (ASCMs) and wide-area air defense systems that feature qualitative improvements over the [two] earlier SOVREMENNY-class DDGs China purchased from Russia."¹⁸ In light of these improvements, DOD refers to these two ships as Sovremenny II class destroyers.¹⁹

¹⁷ Additional points of comparison include the French aircraft carrier Charles de Gaulle (commissioned in 2001), which has a displacement of about 42,000 tons, and aircraft carriers that the United Kingdom and France plan to commission into service between 2014 and 2016, which are to have displacements of 65,000 to 70,000 tons. The Charles de Gaulle can operate an air wing of about 36 aircraft, the future UK and French carriers are to operate air wings of about 40 to 45 aircraft, and the U.S. Navy's Nimitz-class carriers can operate air wings of 70 or more aircraft.

¹⁸ 2007 DOD CMP, p. 3. The DOD report spells Sovremenny with two "y"s at the end.

¹⁹ 2008 DOD CMP, p. 2.

Five New Indigenously Built Destroyer Classes

China since the early 1990s has built five new classes of destroyers, one of which is a variation of another. Compared to China's 14 remaining older Luda (Type 051) class destroyers, which entered service between 1971 and 1991, these five new destroyer classes are substantially more modern in terms of their hull designs, propulsion systems, sensors, weapons, and electronics. A key area of improvement in the new destroyer designs is their anti-air warfare (AAW) technology, which has been a significant PLA Navy shortcoming. Like the older Luda-class destroyers, these new destroyer classes are armed with ASCMs. **Table 2** summarizes the five new classes.

Table 2. New PLA Navy Destroyer Classes

Class name	Type	Number built	Hull number(s)	In service (actual or projected)
Luhu	052	2	112, 113	1994, 1996
Luhai	051B	1	167	1999
Luyang I	052B	2	168, 169	2004
Luyang II	052C	2	170, 171	2004, 2005
Luzhou	051C	2	115, 116	2006, 2007

Source: *Jane's Fighting Ships 2008-2009*.

As shown in **Table 2**, China to date has commissioned only 1 or 2 ships in each of these five classes, suggesting that at least some of these classes might have been intended to serve as stepping stones in a plan to modernize the PLA Navy's surface combatant technology incrementally before committing to larger-scale series production of destroyers.²⁰

The *Luhu-class ships* reportedly were ordered in 1985 but had their construction delayed by a decision to give priority to the construction of six frigates that were ordered by Thailand. The *Luhai-class ship* is believed to have served as the basis for the Luyang-class designs. Compared to the Luhai, the *Luyang I-class ships* appear stealthier. DOD stated in 2008 that the Luyang I design is equipped with the Russian-made SA-N-7B Grizzly SAM and the Chinese-made YJ-83 ASCM.²¹

The **Luyang II-class ships** appear to feature an even more capable AAW system that includes a Chinese-made SAM system called the HHQ-9 that has an even longer range, a vertical launch system (VLS), and a phased-array radar that is outwardly somewhat similar to the SPY-1 radar used in the U.S.-made Aegis combat system.

²⁰ One observer says the limited production runs of these four designs to date "might be financially related, or may relate to debate over what ships should follow the Type 051C air defence and Type 052C multi-role classes, or that once the Type 054A [frigate design] is accepted as the future missile frigate design, three or four of the major warship shipyards will all be assigned to construction of this design, delaying a future CG/DDG class." (Keith Jacobs, "PLA-Navy Update," *Naval Forces*, No. 1, 2007: 24.) Another observer stated in 2007 that "It looks like [the] 052C [class] was stopped for a few years due to [the] JiangNan relocation [and the] sorting out [of] all the issues on [the] 052B/C [designs]. ("2018—deadline for Taiwan invasion?" a September 22, 2007, entry in a blog on China naval and air power maintained by an author called "Feng," available online at <http://china-pla.blogspot.com/2007/09/2018-deadline-for-taiwan-invasion.html>.)

²¹ 2007 DOD CMP, pp. 3-4

DOD stated in 2007 the **Luzhou-class design** “is designed for anti-air warfare. It will be equipped with the Russian SA-N-20 SAM system controlled by the TOMBSTONE phased-array radar. The SA-N-20 more than doubles the range of current PLA Navy air defense systems marking a significant improvement in China’s ship-borne air defense capability.”²²

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.

Four New Indigenously Built Frigate Classes

China since the early 1990s has built four new classes of frigates, two of which are variations of two others, that are more modern than China’s 29 remaining older Jianghu (Type 053) class frigates, which entered service between the mid-1970s and 1989. The four new frigate classes, like the new destroyer classes, feature improved AAW capabilities. Unlike the new destroyer designs, some of the new frigate designs have been put into larger-scale series production. **Table 3** summarizes the four new classes.

Table 3. New PLA Navy Frigate Classes

Class name	Type	Number built or building	Hull number(s)	In service (actual or projected)
Jiangwei I	053 H2G	4	539-542	1991-1994
Jiangwei II	053H3	10	between 521 and 567	1998-2005
Jiangkai I	054	2	525, 526	2005
Jiangkai II	054A	4	530 (lead ship), 529, n/a	2007-2008

Source: Jane’s Fighting Ships 2008-2009

Construction of **Jiangwei I-class ships** appears to have ceased. It is unclear whether construction of **Jiangwei II-class ships** will continue after the 10th ship.

The **Jiangkai I-class ships** feature a stealthy design that somewhat resembles France’s La Fayette-class frigate, which first entered service in 1996.²³ The **Jiangkai II-class ships** are a modified version of the Jiangkai I-class design that features a VLS system for its SAMs. One observer stated in 2008 that “construction of the Jiangkai II-class frigates, armed with vertically launched HQ-7 missiles, continues and these [ships] look to be the mainstay of the fleet as the 1970s-vintage Jianghu class are phased out or adapted for Coast Guard use.”²⁴ Another observer similarly stated in 2007 that a total of 28 to 30 Type 054A frigates “are believed scheduled” for production to replace China’s older-generation frigates.²⁵

²² 2007 DOD CMP, p. 3.

²³ France sold a modified version of the La Fayette-class design to Taiwan; the six ships that Taiwan built to the design entered service in 1996-1998.

²⁴ Jane’s Fighting Ships 2008-2009, p. 30 (Executive Overview). This source similarly states on page 133: “Under construction at two shipyards, it is likely that this design will be built in sufficient numbers to replace the ageing Jianghu class frigates.”

²⁵ Keith Jacobs, “PLA-Navy Update,” *Naval Forces*, No. 1, 2007: 26.

Fast Attack Craft

As an apparent replacement for at least some of its 190 older fast attack craft, or FACs (including 37 armed with ASCMs), China in 2004 introduced a new type of ASCM-armed fast attack craft, called the Houbei (Type 022) class, that uses a stealthy, wave-piercing, catamaran hull. The Houbei class is being built in at least six shipyards. Forty were in service as of 2008, and a total of as many as 100 might be built.²⁶

Amphibious Ships

Yuzhao (Type 071) Amphibious Ship

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, compared with about 15,900 tons to 16,700 tons for the U.S. Navy's Whidbey Island/Harpers Ferry (LSD-41/49) class amphibious ships, which were commissioned into service between 1985 and 1998, and about 25,900 tons for the U.S. Navy's new San Antonio (LPD-17) class amphibious ships, the first of which was commissioned into service in 2006. The first Type 071 ship entered service in 2008. The Type 071 design features a hull with clean, sloped sides—a design that resembles the hulls of modern western amphibious ships and appears intended to reduce the ship's visibility to radar. Some observers believe that China might build a total of four to six Type 071 ships.

Reported Potential Type 081 Amphibious Ship

China reportedly might also begin building a larger amphibious ship, called the Type 081 LHD, that might displace about 20,000 tons. Such a ship might have, among other things, a greater aviation capability than the Type 071 design. Some observers believe China may build a total of three or more Type 081s.

Potential Roles for Type 071 and Type 081 Ships

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 humanitarian assistance and disaster relief (HA/DR) operations, maritime security operations (such as anti-piracy operations), and non-combatant evacuation operations (NEOs). (Some countries are acquiring larger amphibious ships as much, or more, for these kinds of operations as for conducting amphibious landings.) Politically, larger amphibious ships can also be used for naval diplomacy (i.e., port calls and engagement activities).

²⁶ *Jane's Fighting Ships 2008-2009*, p. 30 (Executive Overview) and p. 141. One observer stated in 2007 that: "In addition to the Houbei class, one observer stated in 2007 that China in 2005 ordered 24 to 30 Molniya-class ASCM-armed fast attack craft from Russia. The Molniya class is an upgraded version of the Russian Tarantul-class design that might be armed with four SS-N-22 ASCMs. The first four, according to this observer, were to have been delivered by late-2007 or early-2008." (Keith Jacobs, "PLA-Navy Update," *Naval Forces*, No. 1, 2007: 27.)

Other New Amphibious Ships and Landing Craft

Aside from the Type 071 and Type 081 projects, China between 2003 and 2005 commissioned into service three new classes of smaller amphibious ships and landing craft. Each type was built at three or four shipyards. Between these three other classes, China commissioned into service a total of 20 amphibious ships and 10 amphibious landing craft in 2003-2005. Additional units in some of these classes are possible. China also has numerous older amphibious ships and landing craft of various designs.

Change in Amphibious Lift Capability Since 2000

Although China in recent years has deployed new amphibious ships and craft, DOD states that “PLA air and amphibious lift capacity has not improved appreciably since 2000 when the Department of Defense assessed the PLA as capable of sealift of one infantry division.”²⁷

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 appear to have been for other purposes. In November 2004, for example, a Han-class SSN was detected in Japanese territorial waters near Okinawa.²⁸ DIA states that, as part of the same deployment, this submarine traveled “far into the western Pacific Ocean...”²⁹ Press reports state that the submarine operated in the vicinity of Guam before moving toward Okinawa.³⁰ As another example, on September 9, 2005,

China deployed a fleet of five warships ... near a gas field in the East China Sea, a potentially resource-rich area that is disputed by China and Japan. The ships, including a guided-missile

²⁷ 2009 DOD CMP, p. viii.

²⁸ Mark Magnier, “China Regrets Sub Incident, Japan Says,” *Los Angeles Times*, November 17, 2004; Martin Fackler, “Japanese Pursuit Of Chinese Sub Raises Tensions,” *Wall Street Journal*, November 15, 2004: 20; Kenji Hall, “Japan: Unidentified sub is Chinese,” *NavyTimes.com (Associated Press)*, November 12, 2004. See also 2006 DOD CMP, pp. 11-12.

²⁹ Current and Projected National Security Threats to the United States, Vice Admiral Lowell E. Jacoby, U.S. Navy, Director, Defense Intelligence Agency, Statement for the Record [before the] Senate Select Committee on Intelligence, 16 February 2005, p. 16-17. See also Current and Projected National Security Threats to the United States, Vice Admiral Lowell E. Jacoby, U.S. Navy, Director, Defense Intelligence Agency, Statement For the Record [before the] Senate Armed Services Committee, 17 March 2005, p. 17.

³⁰ Timothy Hu, “Ready, steady, go...,” *Jane’s Defence Weekly*, April 13, 2005: 27; “China Sub Tracked By U.S. Off Guam Before Japan Intrusion,” *Japan Times*, November 17, 2004.

destroyer, were spotted by a Japanese military patrol plane near the Chunxiao gas field, according to the [Japan] Maritime Self-Defense Forces.³¹

Another press report stated:

China said on Sept. 29 [of 2005 that] it has sent warships to the disputed East China Sea, a day ahead of talks with Japan over competing territorial claims in the gas-rich waters.

“I can now confirm that in the East China Sea, a Chinese reserve vessel squadron has been established,” foreign ministry spokesman Qin Gang told a regular briefing....

No details were given on the size of the squadron or the area it will patrol. The establishment of the squadron follows China’s creation of two naval groups in the Bohai Sea and Yellow Sea off the northern China coast, the agency said.³²

On October 26, 2006, a Song-class SS reportedly surfaced five miles away from the Japan-homeported U.S. Navy aircraft carrier Kitty Hawk (CV-63), which reportedly was operating at the time with its strike group in international waters in the East China Sea, near Okinawa. According to press reports, the carrier strike group at the time was not actively searching for submarines, and the Song-class boat remained undetected by the strike group until it surfaced and was observed by one of the strike group’s aircraft.³³ The Chinese government denied that the submarine was following the strike group.³⁴

In December 2008, China deployed two destroyers and a support ship to waters off Somalia to conduct anti-piracy operations. According to one source, this was only the third deployment of Chinese naval ships into the Indian Ocean in more than six centuries.³⁵ U.S. officials stated that they welcomed a Chinese contribution to the current multi-nation effort to combat piracy off Somalia.

China is also building port facilities that may support Chinese naval operations in the Indian Ocean, along the sea line of communication linking China to Persian Gulf oil sources. One press report in 2005 stated:

³¹ Norimitsu Onishi and Howard W. French, “Japan’s Rivalry With China Is Stirring A Crowded Sea,” *New York Times*, September 11, 2005. See also “Japan Upset Over Chinese Warships Near Disputed Area,” *DefenseNews.com*, October 3, 2005.

³² “China Sends Warships to East China Sea,” *DefenseNews.com*, September 29, 2005. *2006 DOD CMP*, p. 2, states that in the Fall of 2005, “PLA Navy vessels trained their weapons on Japanese Self Defense Forces aircraft monitoring Chinese drilling and survey activity in the disputed area.”

³³ Bill Gertz, “China Sub Secretly Stalked U.S. Fleet,” *Washington Times*, November 13, 2006: 13; Philip Creed, “Navy Confirms Chinese Sub Spotted Near Carrier,” *NavyTimes.com*, November 13, 2006; Bill Gertz, “Defenses On [sic] Subs To Be Reviewed,” *Washington Times*, November 14, 2006; En-Lai Yeoh, “Fallon Confirms Chinese Stalked Carrier,” *NavyTimes.com*, November 14, 2006; Bill Gertz, “Admiral Says Sub Risked A Shootout,” *Washington Times*, November 15, 2006; Jeff Schogol, “Admiral Disputes Report That Kitty Hawk, Chinese Sub Could Have Clashed,” *Mideast Starts and Stripes*, November 17, 2006.

³⁴ Associated Press, “China Denies Reports That Sub Followed Kitty Hawk,” *NavyTimes.com*, November 16, 2006. A shorter version of the same story was published as Associated Press, “China Denies Sub Followed A Group Of U.S. Warships,” *Asian Wall Street Journal*, November 17, 2006: 11.

³⁵ Andrew S. Erickson and Justin D. Mikolay, “Welcome China to the Fight Against Pirates,” U.S. Naval Institute Proceedings, March 2009: 36.

China is building up military forces and setting up bases along sea lanes from the Middle East to project its power overseas and protect its oil shipments, according to a previously undisclosed internal report prepared for Defense Secretary Donald H. Rumsfeld.

“China is building strategic relationships along the sea lanes from the Middle East to the South China Sea in ways that suggest defensive and offensive positioning to protect China’s energy interests, but also to serve broad security objectives,” said the report sponsored by the director, Net Assessment, who heads Mr. Rumsfeld’s office on future-oriented strategies.

The Washington Times obtained a copy of the report, titled “Energy Futures in Asia,” which was produced by defense contractor Booz Allen Hamilton.

The internal report stated that China is adopting a “string of pearls” strategy of bases and diplomatic ties stretching from the Middle East to southern China....³⁶

An August 2008 press report stated:

Is China marking space for itself in Myanmar’s Coco Islands again? India is suddenly up and alert after senior Chinese naval officers recently visited the islands to “upgrade” facilities there.

³⁶ Bill Gertz, “China Builds Up Strategic Sea Lanes,” *Washington Times*, January 18, 2005, p.1. The report stated that China is:

- operating an eavesdropping post and building a naval base at Gwadar, Pakistan, near the Persian Gulf;
- building a container port facility at Chittagong, Bangladesh, and seeking “much more extensive naval and commercial access” in Bangladesh;
- building naval bases in Burma, which is near the Strait of Malacca;
- operating electronic intelligence-gathering facilities on islands in the Bay of Bengal and near the Strait of Malacca;
- building a railway line from China through Cambodia to the sea;
- improving its ability to project air and sea power into the South China Sea from mainland China and Hainan Island;
- considering funding a \$20-billion canal that would cross the Kra Isthmus of Thailand, which would allow ships to bypass the Strait of Malacca and permit China to establish port facilities there.

According to the article,

The Pentagon report said China, by militarily controlling oil shipping sea lanes, could threaten ships, “thereby creating a climate of uncertainty about the safety of all ships on the high seas.”

The report noted that the vast amount of oil shipments through the sea lanes, along with growing piracy and maritime terrorism, prompted China, as well as India, to build up naval power at “chokepoints” along the sea routes from the Persian Gulf to the South China Sea.”

China ... is looking not only to build a blue-water navy to control the sea lanes, but also to develop undersea mines and missile capabilities to deter the potential disruption of its energy supplies from potential threats, including the U.S. Navy, especially in the case of a conflict with Taiwan,” the report said....”The Iraq war, in particular, revived concerns over the impact of a disturbance in Middle Eastern supplies or a U.S. naval blockade,” the report said, noting that Chinese military leaders want an ocean-going navy and “undersea retaliatory capability to protect the sea lanes.”

China believes the U.S. military will disrupt China’s energy imports in any conflict over Taiwan, and sees the United States as an unpredictable country that violates others’ sovereignty and wants to “encircle” China, the report said.

See also Edward Cody, “China Builds A Smaller, Stronger Military,” *Washington Post*, April 12, 2005, p. 1.

On June 25, according to reports reaching India, in an unpublicised visit, a Chinese naval delegation led by Col Chi Ziong Feng, accompanied a Myanmar delegation headed by Brig Gen Win Shein, into the Coco Islands.

According to sources, Brig Gen Shein is commander of Ayeyarwaddy (Irrawaddy) naval headquarters, which controls the island.

According to sources monitoring developments, China decided to help Myanmar upgrade systems in the island.

Myanmar would increase its naval troop strength on the island, while China would help in building two more helipads and storage systems for arms. What was of greater interest to India was that China reportedly agreed to “upgrade” communication facilities on the island.³⁷

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, this CRS report does not present comparisons of such figures, because they 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.

³⁷ Indrani Bagchi, “China Eyeing Base in Bay of Bengal?” *Times of India*, August 9, 2008, posted online at http://timesofindia.indiatimes.com/China_eyeing_base_in_Bay_of_Bengal/articleshow/3343799.cms

- 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. This CRS report shows numbers of more modern and more capable submarines, destroyers, and frigates in **Table 1**, **Table 2**, and **Table 3**, respectively.
- 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-based anti-ship ballistic missiles (ASBMs), -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.

Potential Oversight Issues for Congress

China as a Defense-Planning Priority

In U.S. defense planning and programming, including the Quadrennial Defense Review (QDR), how much emphasis should be placed on programs for countering improved Chinese military forces in coming years?

As stated at the outset, 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. Observers disagree on the issue, with some arguing that such programs should receive significant emphasis, others arguing that they should receive relatively little, and still others taking an intermediate position.

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. Secretary Gates addressed the issue, particularly as it regards the Navy, in an April 17, 2009, speech at the Naval War College, stating:

some people may think I am too consumed by the current wars to give adequate consideration to our long-term acquisition needs. In this respect, the lessons of the last few years have implications for all Defense programs:

- Lessons about preparing for the kinds of war we are most likely to face and not just the kinds we are best-suited to fight;
- Lessons about the limits of technology when faced with the fog, friction, and ugly realities of an unpredictable battlefield; and
- Lessons about our internal processes, and where they may come undone when faced with unexpected contingencies, evolving requirements, and the prolonged strains of persistent conflict. Not to mention the ability of an agile adversary to get inside our ponderous decision and acquisition cycle.

All of this goes far beyond Iraq and Afghanistan – it goes to the heart of maintaining a defense posture rooted in real-world scenarios with real-world assessments of our capabilities and, perhaps most important, our limits, both institutionally and operationally. As I've said before in other settings, the responsibility of this Department first and foremost is to fight and win wars – not just constantly prepare for them.

Now, even with this in mind – and perhaps especially with this in mind – we cannot ignore the risks posed by the military forces of other state actors. This is a particularly salient issue for this group, as the weight of America's conventional and strategic strength has shifted to our air and naval forces....

Where the trend of future conflict is clear, I have made specific recommendations. For example, I hope to accelerate the buy of the Littoral Combat Ship, which, despite its development problems, is a versatile ship that can be produced in quantity and go to places that are either too shallow or too dangerous for the Navy's big, blue-water surface combatants. As we saw last week, you don't necessarily need a billion-dollar ship to chase down a bunch of teenage pirates. The size of the ship in such cases is less important than having Navy SEALs onboard. To carry out the missions we may face in the future – whether dealing with non-state actors at sea or near shore, or swarming speedboats – we will need numbers, speed, and ability to operate in shallow waters.

We also must examine our blue-water fleet and the overall strategy behind the kinds of ships we are buying. The need to show presence and project power from a piece of sovereign territory called a United States Navy ship will never go away. But we cannot allow more ships to go the way of the DDG-1000 – where since its inception the projected buy has dwindled from 32 to three as costs per ship have more than doubled. One of the things that I am recommending in this budget is to upgrade and build more Arleigh Burke destroyers, still a best-in-class ship that has been the workhorse of the U.S. surface fleet for nearly two decades. And a ship that has proven that it can be upgraded rapidly with new capabilities and technologies.

The United States must not take its current dominance for granted and needs to invest in programs, platforms, and personnel that will ensure that we remain preeminent at sea. But rather than go forward under the same assumptions that guided our shipbuilding during the Cold War, I believe we need to develop a more rigorous analytical framework before moving forward – the type of framework that will be provided by the Quadrennial Defense Review. That is one reason I delayed a number of decisions on programs such as the follow on manned bomber, the next generation cruiser, as well as overall maritime capabilities. The purpose was to develop an analytical construct through which we can more precisely determine what will be needed in coming years. To determine what kind of tactics and strategies future adversaries, both state and non-state actors, are likely to pursue.

In this respect, it is important to keep some perspective. For example, as much as the U.S. Navy has shrunk since the end of the Cold War, in terms of tonnage, its battle fleet, by one estimate, is still larger than the next 13 navies combined – and 11 of those 13 navies are U.S. allies or partners. In terms of capabilities, the over-match is even greater. No country in the rest of the world has anything close to the reach and firepower to match a carrier strike group. And the United States has and will maintain eleven until at least 2040. I might also note that we have a number of Expeditionary Strike Groups and will in the not-too-distant future will be able to carry the F-35.

Potential adversaries are well-aware of this fact, which is why, despite significant naval modernization programs underway in some countries, no one intends to bankrupt themselves by challenging the U.S. to a shipbuilding competition akin to the Dreadnought arms race prior to World War I. Instead, we've seen their investments in weapons geared to neutralize our advantages – to deny the U.S. military freedom of movement and action while potentially threatening our primary means of projecting power: our bases, sea and air assets, and the networks that support them.

This is a particular concern with aircraft carriers and other large, multi-billion dollar blue-water surface combatants – where the loss of even one ship would be a national catastrophe. We know other nations are working on ways to thwart the reach and striking power of the U.S. battle fleet – whether by producing stealthy submarines in quantity or developing anti-ship missiles with increasing range and accuracy. We ignore these developments at our peril.

The Royal Navy's greatest defeat in World War II – the sinking of the capital ships H.M.S. *Repulse* and the brand new *Prince of Wales* by Japanese aircraft just days after Pearl Harbor – was due in part to a command with little appreciation for air power, and in particular the threat posed by a single, air-delivered torpedo.

I have also directed the QDR team to be realistic about the scenarios where direct U.S. military action would be needed – so we can better gauge our requirements. One of those that will be examined closely is the need for a new capability to get large numbers of troops from ship to shore – in other words, the capability provided by the Marine Expeditionary Fighting Vehicle. No doubt, it was a real strategic asset during the first Gulf War to have a flotilla of Marines waiting off Kuwait City – forcing Saddam's army to keep one eye on the Saudi border, and one eye on the coast. But we have to take a hard look at where it would be necessary or sensible to launch another major amphibious action again. In the 21st century, how much amphibious capability do we need?

Overall, we have to consider the right mix of weapons and ships to deal with the span of threats we will likely face. The goal of our procurement should be to develop a portfolio – a

mixture of weapons and capabilities whose flexibility allows us to respond to a spectrum of contingencies on and beyond the horizon.³⁸

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 humanitarian assistance and disaster response (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

³⁸ Source: Text of remarks as delivered by Secretary of Defense Robert Gates at the Naval War College, Newport, RI, April 17, 2009.

- 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 humanitarian assistance and disaster response (HA/DR) operations, anti-piracy operations, and other maritime-security operations.

Potential Navy-Related Program Implications

What are the potential Navy-related program implications of placing a relatively strong emphasis on countering improved Chinese military forces in coming years?

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),³⁹
- 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 3 Aegis cruisers and *all* Aegis destroyers.⁴⁰

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.)⁴¹

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. The Navy's plans for procuring cruisers and destroyers in coming years are not yet fully defined. Capabilities to emphasize in procurement of cruisers and destroyers would include BMD, AAW, and ASW.

An emphasis on procuring highly capable aircraft could affect decisions regarding procurement of carrier-based F/A-18E/F Super Hornets and F-35Cs (the Navy version of the Joint Strike Fighter). In addition, the Navy is currently developing a stealthy, long-range, unmanned combat air system (UCAS) for use in the Navy's carrier air wings. The demonstration program for the system is called UCAS-D. The subsequent production version of the aircraft is called N-UCAS, with the N standing for Navy. Some observers, including analysts at the Center for Strategic and Budgetary Assessments (CSBA), believe that N-UCAS would be highly useful, if not critical, for countering improved Chinese maritime military forces. N-UCASs, they argue, could be launched from a carrier shortly after the ship leaves port in Hawaii, be refueled in flight, and arrive in the Taiwan Strait area in a matter of hours, permitting the carrier air wing to contribute to U.S. operations

³⁹ For more on the SSGNs, see CRS Report RS21007, *Navy Trident Submarine Conversion (SSGN) Program: Background and Issues for Congress*, by Ronald O'Rourke.

⁴⁰ For more on sea-based BMD programs, see CRS Report RL33745, *Sea-Based Ballistic Missile Defense — Background and Issues for Congress*, by Ronald O'Rourke

⁴¹ For further discussion, see CRS Report RL32109, *Navy DDG-1000 and DDG-51 Destroyer Programs: Background, Oversight Issues, and Options for Congress*, by Ronald O'Rourke.

there days before the carrier itself would arrive. They also argue that N-UCASs would permit Navy carriers to operate effectively while remaining outside the reach of China's anti-access weapons, including ASBMs.⁴²

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."⁴³

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 2010.⁴⁴

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,⁴⁵ 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.⁴⁶

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

⁴² Thomas P. Ehrhard and Robert O. Work, *The Unmanned Combat Air System Carrier Demonstration Program: A New Dawn For Naval Aviation?*, Center for Strategic and Budgetary Assessments, Washington, 2007. 39 pp. (CSBA Backgrounder, May 10, 2007). The authors briefed key points from this document on July 11, 2007, in room S-211 of the Capitol. Another observer states that China's deployment of ASBM's and supporting surveillance and targeting systems "argues for a stealth long-range attack aircraft as part of the [carrier] airwing to provide more flexibility on how we employ our carriers." (James Lyons, "China's One World?" *Washington Times*, August 24, 2008: B1

⁴³ U.S. Department of Defense, *Quadrennial Defense Review Report*. Washington, 2006. (February 6, 2006) p. 47.

⁴⁴ Mike Barber, "Navy's Fast-Attack Submarine Signals News Mission In Pacific," *Seattle Post-Intelligencer*, February 1, 2008.

⁴⁵ For more on this proposal, see CRS Report R40248, *Navy Nuclear Aircraft Carrier (CVN) Homeporting at Mayport: Background and Issues for Congress*, by Ronald O'Rourke.

⁴⁶ Source: Slide entitled "Strategic Laydown Summary," in Navy briefing entitled "Final Environmental Impact Statement (FEIS) for the Proposed Homeporting of Additional Surface Ships at Naval Station Mayport, FL, dated November 18, 2008, and presented to CRS on December 5, 2008. For more on the Navy's proposed 313-ship fleet, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

Los Angeles (SSN-688) class attack submarines and a submarine tender. Navy ships homeported in Hawaii include 15 Virginia (SSN-774) and Los Angeles 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.⁴⁷

Fleet Architecture—Larger vs. Smaller Ships

Should the Navy shift over time to a more highly distributed fleet architecture featuring a reduced reliance on larger ships and an increased reliance on 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.

Supporters of shifting to a more highly distributed fleet architecture argue that that the Navy’s current architecture, including its force of 11 or 12 large aircraft carriers, in effect puts too many of the Navy’s combat-capability eggs into a relatively small number of baskets on which an adversary can concentrate its surveillance and targeting systems and its anti-ship weapons. They argue that although a large Navy aircraft carrier can absorb hits from multiple conventional weapons without sinking, a smaller number of enemy weapons might cause damage sufficient to stop the carrier’s aviation operations, thus eliminating the ship’s primary combat capability and providing the attacker with what is known as a “mission kill.” A more highly distributed fleet architecture, they argue, would make it more difficult for China to target the Navy and reduce the possibility of the Navy experiencing a significant reduction in combat capability due to the loss in battle of a relatively small number of high-value units.

Opponents of shifting to a more highly distributed fleet architecture argue that large carriers and other large ships are not only more capable, but proportionately more capable, than smaller ships, that larger ships are capable of fielding highly capable systems for defending themselves, and that they are much better able than smaller ships to withstand the effects of enemy weapons, due to their larger size, extensive armoring and interior compartmentalization, and extensive damage-control systems. A more highly distributed fleet architecture, they argue, would be less capable or more expensive than today’s fleet architecture. Opponents of shifting to a more highly distributed fleet architecture argue could also argue that the Navy has already taken an important (but not excessive) step toward fielding a more distributed fleet architecture through its plan to acquire 55 Littoral Combat Ships (LCSs), which are small, fast surface combatants with modular, “plug-and-flight” mission payloads.⁴⁸

⁴⁷ U.S. Congressional Budget Office, *Increasing the Mission Capability of the Attack Submarine Force*, Washington, CBO, 2002. (A CBO Study, March 2002), 41 pp.

⁴⁸ For more on the LCS, see CRS Report RL33741, *Navy Littoral Combat Ship (LCS) Program: Background, Oversight Issues, and Options for Congress*, by Ronald O’Rourke.

The issue of Navy fleet architecture, including the question of whether the Navy should shift over time to a more highly distributed fleet architecture, was examined in a report by DOD's Office of Force Transformation (OFT) that was submitted to Congress in 2005. OFT's report, along with two other reports on Navy fleet architecture that were submitted to Congress in 2005, are discussed at length in another CRS report.⁴⁹

Legislative Activity

FY2009

FY2009 Defense Authorization Bill (H.R. 5658/S. 3001)

House

The House Armed Services Committee, in its report (H.Rept. 110-652 of May 16, 2008) on H.R. 5658, stated the following regarding the development of an anti-air warfare target for simulating Threat D, which some press reports suggest might be a term that refers to an ASCM with a flight profile similar that of the SS-N-27 Sizzler:⁵⁰

The committee is pleased to note the anticipated source selection for the development of a Threat D missile target development program in the summer of 2008. The committee remains concerned that the estimated initial operating capability of such a target in 2014 creates substantial risk during the interim period. The committee encourages the Secretary to accelerate the target development program to the maximum extent practicable. In addition, the committee directs the Secretary of the Navy to notify the congressional defense committees in writing if the estimated initial operating capability of the Threat D target is delayed more than 90 days or if the costs associated with such program exceeds 10 percent of programmed funding. The committee further directs the Secretary to provide such notification within 30 days, along with the reasons for such delay or cost overrun and a mitigation plan consisting of actions that could restore the program to its original timeline. (Page 204)

⁴⁹ See CRS Report RL33955, *Navy Force Structure: Alternative Force Structure Studies of 2005—Background for Congress*, by Ronald O'Rourke. The functions carried out by OFT have since been redistributed to other DOD offices.

⁵⁰ See "United States: The Supersonic Anti-Ship Missile Threat," *Stratfor.com*, April 18, available online at http://www.stratfor.com/analysis/united_states_supersonic_anti_ship_missile_threat?ip_auth_redirect=1; Tony Capaccio, "Navy Can't Test Defense Against China's Sizzler," Until 2014," *Bloomberg.com*, April 3, 2008; Chris Johnson, "Navy Issues Draft Request For Threat-D Target Development," *Inside the Navy*, July 30, 2007; Chris Johnson, "Industry Day Planned To Develop Threat-D Target For Ship Tests," *Inside the Navy*, July 9, 2007; and Chris Johnson, "Pentagon: Lack Of Threat-D Target Hinders Testing For New Vessels," *Inside the Navy*, January 22, 2007. See also the transcript of the March 12, 2008, hearing before the House Armed Services Committee on the posture of the Pacific Command.

FY2008

FY2008 Defense Authorization Act (H.R. 1585/S. 1547/H.R. 4986/P.L. 110-181)

House

Section 1244 of the House-reported version of the FY2008 defense authorization bill (H.R. 1585) stated:

SEC. 1244. SENSE OF CONGRESS CONCERNING THE STRATEGIC MILITARY CAPABILITIES AND INTENTIONS OF THE PEOPLE'S REPUBLIC OF CHINA.

It is the sense of Congress that—

(1) United States military war-fighting capabilities are potentially threatened by the strategic military capabilities and intentions of the People's Republic of China, as demonstrated by—

(A) the October 2006 undetected broach of a Chinese SONG-class diesel-electric submarine in close proximity of the USS Kitty Hawk in international waters; and

(B) the January 2007 test of a direct ascent anti-satellite (ASAT) weapon, posing a potential threat to United States military assets in space;

(2) it is in the national security interests of the United States to make every effort to understand China's strategic military capabilities and intentions; and

(3) as part of such an effort, the Secretary of Defense should expand efforts to develop an accurate assessment of China's strategic military modernization, particularly with regard to its sea- and space-based strategic capabilities.

Senate

The Senate-passed version of the FY2008 defense authorization bill (S. 1547; S.Rept. 110-77 of June 5, 2007) did not contain a provision analogous to Section 1244 of the House-passed version of H.R. 1585 (see above).

Conference

The conference report (H.Rept. 110-477 of December 6, 2007) on H.R. 1585 did not contain a provision analogous to the Sec. 1244 of the House-passed version of H.R. 1585. The conference report stated:

The conferees note China's continued investment in strategic military capabilities that could be used to support power projection and access denial operations beyond the Asia Pacific region, and the lack of transparency surrounding the strategic military capabilities and intentions relating to China's military modernization. The Pentagon's 2006 Quadrennial Defense Review Report (QDR) found that China is at a strategic crossroads and that, "of the major and emerging powers, China has the greatest potential to compete militarily with the United States." The conferees note that during the last year, China demonstrated such potential, including the October 2006 broach of a Chinese SONG-class diesel-electric submarine in close proximity to the USS Kitty Hawk aircraft carrier in international waters

and the January 2007 test of a direct ascent anti-satellite missile against a Chinese weather satellite in low-earth orbit.

The conferees encourage the Secretary of Defense to expand efforts to develop an accurate assessment and understanding of China's strategic military modernization and strategic intentions, particularly with regard to its sea- and space-based strategic capabilities. (Page 1031)

H.R. 1585 was vetoed by the President on December 28, 2008. A new bill, H.R. 4986, was passed with changes that took into account the President's objection to certain parts of H.R. 1585. The President's objection to certain parts of H.R. 1585 did not relate to the passage quoted above. H.R. 4986 was signed into law as P.L. 110-181 of January 28, 2008. Except for the changes made by Congress to take into account the President's objection to certain parts of H.R. 1585, H.Rept. 110-477 in effect serves as the conference report for H.R. 4986.

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