

SECTION 2: CHINA'S NAVAL MODERNIZATION

“... the United States-China Economic and Security Review Commission ... shall investigate and report exclusively on—

...

“REGIONAL ECONOMIC AND SECURITY IMPACTS—The triangular economic and security relationship among the United States, Taipei and the People’s Republic of China (including the military modernization and force deployments of the People’s Republic of China aimed at Taipei), the national budget of the People’s Republic of China, and the fiscal strength of the People’s Republic of China in relation to internal instability in the People’s Republic of China and the likelihood of the externalization of problems arising from such internal instability. ...”

Introduction

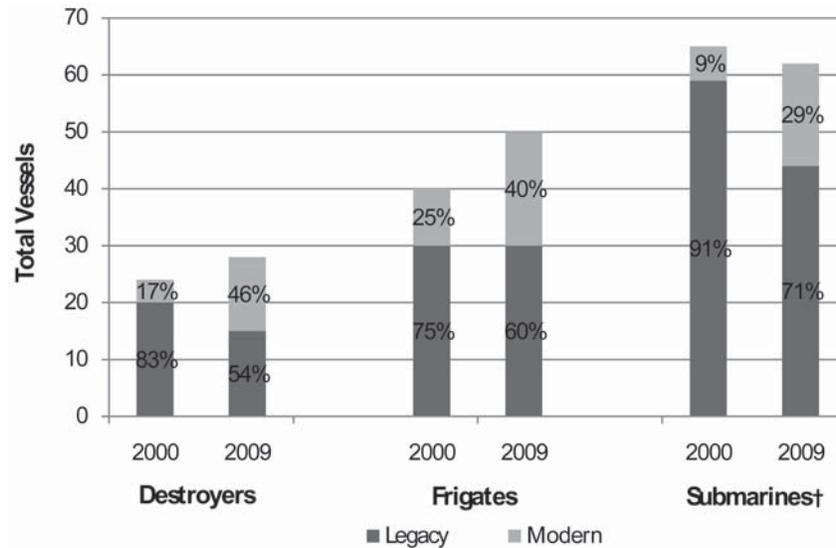
On April 30, 2009, the Chinese military conducted a large fleet review in the port city of Qingdao, China, commemorating the 60th anniversary of the People’s Liberation Army Navy, or PLA Navy. On display were many of the navy’s newest vessels and aircraft, including its little-seen nuclear-powered ballistic missile submarines. In total, the review included 25 Chinese vessels, as well as 21 foreign navy vessels that Beijing invited.* For China, the Qingdao fleet review was an opportunity to demonstrate to domestic and international audiences the tremendous progress the PLA Navy has made in modernizing its forces over the years.

Since the mid-1990s, China has embarked on its largest naval modernization since the People’s Republic of China (PRC) was founded in 1949. In recent years, China has quantitatively and qualitatively improved its modern naval platforms, purchasing or indigenously producing 38 submarines, 13 destroyers, 16 frigates, at least 40 fast-attack craft, and dozens of naval aircraft. In addition to these more modern platforms, the PLA Navy has also developed advanced offensive and defensive weapons, such as antiship cruise missiles, land-attack cruise missiles, and sea mines. Advances in the navy’s command and control systems permit the new platforms and weapons to exchange data and to coordinate with each other. In order to better use these new weapons, platforms, and equipment, the navy has also carried out a series of organiza-

*On the Chinese side, only domestically produced vessels participated in the fleet review; Chinese vessels procured from foreign suppliers, such as the *Kilo*-class submarines bought from Russia, did not participate.

tional, personnel, training, and logistics reforms. With the introduction of these various reforms and modernization programs, the Chinese navy also appears to have adjusted its methods of conducting operations to better match its new capabilities.

Figure 1: Comparison of Modern* and Legacy PLA Navy Combatants (2000 vs. 2009)



Sources: International Institute for Strategic Studies, *The Military Balance 2000–2001* (Oxford: Oxford University Press, 2000), p. 195; and International Institute for Strategic Studies, *The Military Balance 2009* (London: Routledge, 2009), p. 383–84.

* This Report categorizes the following Chinese classes as modern vessels. Destroyers: *Luhai*, *Luhu*, *Luyang (I & II)*, *Luzhou*, and *Sovremenny*; frigates: *Jiangkai (I & II)*, and *Jiangwei (I & II)*; and submarines: *Jin*, *Kilo*, *Shang*, *Song*, and *Yuan*.

† This graph aggregates both ballistic missile submarines and attack submarines for purposes of determining final numbers.

The Chinese government presents several reasons for its large-scale naval modernization. First, China seeks to prevent Taiwan from declaring independence. This includes deterring, denying, or delaying any nation from coming to Taiwan's aid in the event of a crisis with the mainland. Second, in order to safeguard China's continued economic development, the PLA Navy needs to be able to defend China's coast from any maritime assaults. A third reason, also tied to China's economy, is that the navy must be able to defend China's disputed maritime territorial claims. Fourth, the navy is increasingly being called upon to protect international sea lanes used by China's merchant fleet, a task that, until recently, the navy was incapable of performing. Fifth, part of China's naval modernization is to improve China's nuclear deterrent capabilities by creating a credible, at-sea nuclear deterrent force. A final factor is nationalistic pride and the desire for China to have a modern navy that befits a global power.

The importance of China's Naval Modernization to Beijing

Demonstrating the importance that Beijing attaches to modernizing its navy, Vice Admiral Su Shiliang, chief of staff of the PLA Navy, wrote in June 2009 that

*[p]resently, while [China's] national economic development still faces many difficulties, the Party Central Committee and the Central Military Commission regard the navy as a priority service for force building, and continually increase naval investments. This fully reflects the importance and aspirations they have for the navy, and raises new, even higher requirements for us to scientifically plan naval military work.*¹¹³

China's naval modernization impacts U.S. interests in the region. A more powerful and capable PLA Navy will increasingly have the ability to inhibit U.S. military access to the region. Dubbed an "antiaccess strategy" by western observers, this strategy rests on the ability to exert control over China's coastal seas in order to deny an opponent the ability to operate safely in those areas in the event of a conflict. As the PLA Navy improves its reach, surveillance, and antiaccess capabilities, the area over which it can exert control will likely expand outward. And as Chinese naval capabilities improve, other actors, including U.S. friends and allies, may feel threatened. This in turn could provoke a naval arms race—signs of which are already beginning to appear.

This section of the Annual Report identifies some of the factors behind China's naval modernization, describes examples of how Beijing is modernizing the PLA Navy, and examines the possible implications for the United States.

Reasons for China's Naval Modernization

This section will discuss six reasons for China's naval modernization that are most commonly referred to in Chinese statements and documents: 1) deter Taiwan's independence; 2) defend China's maritime security; 3) defend China's maritime sovereignty and maritime economic interests; 4) ensure China's access to increasingly important sea lanes; 5) develop China's at-sea nuclear deterrent capabilities; and 6) satisfy a national desire for a modern navy. Each reason will be discussed in turn.

Deter Taiwan's Independence

Since the mid 1990s, the central focus of China's naval modernization efforts has been to deter Taiwanese independence.¹¹⁴ For China, deterring Taiwan's independence has political, military, and economic significance. Taiwan independence ultimately challenges the Chinese Communist Party's (CCP) continued rule in Beijing, because the CCP has partially staked its legitimacy on reunification with Taiwan.¹¹⁵ In addition, Taiwan's continued de facto independence hinders "China's emergence as a regional power since it would limit the [People's Liberation Army's] strategic space."¹¹⁶ Describing the economic costs of formally losing Taiwan, the PLA Academy of Military Science—China's premier military think tank—wrote that

*Taiwan is the strategic key for mainland China's passage to the ocean, and is extremely critical to the development of our maritime economy and ensuring our maritime safety. If Taiwan successfully separates, then China's gateway to the Pacific Ocean will close.*¹¹⁷

For Beijing, a key component of ensuring that Taiwan does not declare independence requires deterring, denying, or delaying the United States from intervening on Taiwan's behalf. Rear Admiral Michael McDevitt (U.S. Navy, Ret.), vice president of the not-for-profit research corporation CNA and director of its Strategic Studies division, testified to the Commission that China aims to keep "an approaching force from closing to within striking range of the Chinese mainland and the Taiwan Strait"—a sentiment echoed by several experts who testified to the Commission on this topic.¹¹⁸ Cortez A. Cooper, a senior international policy analyst at the RAND Corporation, stated that a goal of China's naval modernization is to "vastly improv[e] the capability to hold U.S. naval formations at risk in the Western Pacific, and to delay or deny their entry into a Taiwan theater of operations."¹¹⁹ Paul S. Giarra, president of the defense analysis company Global Strategies and Transformation, directly attributed China's attempts to develop an antiship ballistic missile (discussed further below) to the need to prevent U.S. naval surface vessels—"the centerpiece of American naval power and the basis for U.S. deterrence strategy"—from nearing China's coastline.¹²⁰

Although cross-Strait relations have improved since the election of Ma Ying-jeou to Taiwan's presidency in March 2008, Beijing still watches Taiwan warily (see chap. 3, sec. 2, for more on cross-Strait relations). For example, in May 2008, then Lieutenant General Ma Xiaotian, deputy chief of the PLA general staff, stated that while the cross-Strait relationship had taken a positive turn, pro-Taiwan independence advocates on the island remain a problem.¹²¹ More recently, this wariness was repeated in China's authoritative 2008 defense white paper, which stated that "separatist forces working for 'Taiwan independence' pose threats to China's unity and security."¹²²

Defend China's Maritime Security

A core task of any navy is to prevent and resist maritime assaults and, as China's defense white papers over the years demonstrate, the PLA Navy is no exception.¹²³ During Chinese President Hu Jintao's *Historic Missions* speech (see sec. 1 of this chapter for more on the *Historic Missions*), he stated that the military should "firmly resist foreign invasions."¹²⁴ Demonstrating the navy's role in this task, the PLA Academy of Military Science wrote that the navy should "independently or along with ground or air force operations, effectively resist enemy assaults coming from the seas."¹²⁵ In 2008, President Hu again pointed out the importance of maritime security, stating, "currently, the main threats to our national security...come from the sea."¹²⁶ Writing earlier this year, the PLA Navy chief of staff stated that although a major maritime invasion was unlikely, the navy still needs to improve its capabilities to defend China's maritime security because of possible regional crises.¹²⁷

A key reason for the focus on protecting China's maritime approach is the need to shield the heart of China's economy—its eastern seaboard.¹²⁸ According to China's official 2008 statistical yearbook, the gross domestic product (GDP) of the eastern coastal provinces made up at least 65 percent of China's total GDP in 2007.¹²⁹ Furthermore, 18 of the top 20 Chinese cities with the highest GDP per capita are all located in coastal provinces.¹³⁰ Any military conflict involving China's coastal areas would likely severely hurt China's continued economic development. For this reason, Rear Admiral Yao Wenhui, deputy director of the navy's Political Department, wrote in 2007 that "China's economic center of gravity is increasingly concentrated in the coastal areas. If these areas are not secure, then there can be no talk of China's economic security."¹³¹

Defend China's Maritime Sovereignty and Maritime Economic Interests

The PLA's naval modernization also aims to support and defend China's disputed maritime territorial claims and their associated maritime economic interests. Besides Taiwan, China is currently involved in several maritime territorial disputes. As President Hu stated in 2004,

*[m]ore than half of the three million square kilometers of maritime surface area over which China has sovereignty and jurisdiction is involved in territorial water or maritime rights and interest disputes with neighboring states.*¹³²

The most important maritime territorial disputes are with Japan and Taiwan over the Senkaku (Diaoyu) Islands in the East China Sea; with Vietnam and Taiwan over the Paracel (Xisha) Islands in the South China Sea; and with Brunei, Malaysia, the Philippines, Taiwan, and Vietnam over the Spratly (Nansha) Islands also in the South China Sea. While some of these disputed islands are little more than rock outcroppings with limited intrinsic value, the presence of nearby natural resources, such as oil, natural gas, minerals, and fisheries; significantly increases their strategic value.¹³³

The leadership in Beijing increasingly feels that maritime resources are an important fuel for China's continued economic growth. For example, during his *Historic Missions* speech in 2004, President Hu stated that China's economic progress had caused China's interests to expand out into the ocean.¹³⁴ Four years later, he again pointed out that "China has enormous strategic maritime interests."¹³⁵ In February 2009, Vice Premier Li Keqiang starkly emphasized the importance of the maritime environment to China's future, stating that

*[e]very day the oceans are becoming an increasingly important area and resource treasure trove for mankind's economy and society, and competition among nations to develop their maritime interests is intensifying. Looking into the future, whoever doesn't value the oceans will lose their room for development. Therefore, maritime enterprises concern the overall situation of China's economic and social development, and concern the fundamental interests of the Chinese people.*¹³⁶

Because of the importance of maritime economic resources for China, its leaders believe its maritime interests need to be defended. When President Hu stated in 2004 that China's interests had expanded into the oceans, he also called upon the military to defend these newly expanded interests.¹³⁷ He repeated this statement in 2008, when he called on China "to strongly emphasize defending [its] maritime rights and interests."¹³⁸ According to China's 2008 defense white paper, defending these maritime interests is a key responsibility of the PLA Navy.¹³⁹ As Frederic Vellucci Jr, a China analyst with the research institute CNA, testified to the Commission, the naval forces and capabilities that China is currently developing to counter a Taiwan crisis could just as easily be used to enforce China's various territorial claims.¹⁴⁰

Protect China's Access to International Energy and Trade Sea Lanes

As emphasized by Chinese security analysts during the Commission's May 2009 trip to China, Beijing is deeply concerned about China's access to international sea lanes.¹⁴¹ China's economy is increasingly dependent upon energy imports and overseas trade, both of which predominantly rely upon maritime routes. Lu Zhongwei, then president of the influential Chinese think tank China Institutes of Contemporary International Relations (CICIR), wrote in the foreword to a 2005 book dedicated entirely to sea lane security that

*[a]long with persistent and rapid increase of China's GDP and the development of the 'Go Out' strategy, China's dependency on overseas natural resources, energy, and commodity markets will continue to grow. ...Sea lanes will increasingly become the main artery of [China's] economy.*¹⁴²

Beijing appears to be particularly concerned about China's energy imports. As President Hu Jintao stated in 2005 at a Central Political Department conference, "Energy resources are a major strategic issue concerning China's overall economic and social development."¹⁴³ This was not President Hu's first mention of energy security: In late December 2003, he told attendees at an Economic Work Conference of the CCP Central Committee that although more than 80 percent of China's oil imports traversed the Malacca Strait, China was incapable of responding should a foreign power decide to sever this sea lane—a situation he reportedly referred to as the "Malacca Dilemma."¹⁴⁴ In 2007, the deputy director of the navy's Political Department, Yao Wenhui, echoed these sentiments, writing that

*[e]nsuring the security of strategic sea lanes is extremely important, especially key imported strategic materials, such as petroleum, which are highly dependent upon sea lanes for transportation.*¹⁴⁵

The Chinese security community also is aware of the constraints placed on both Japan and the United Kingdom during the Second World War due to blockades of their respective seaborne energy supplies.¹⁴⁶

Some western analysts believe that during a time of conflict China would likely be incapable of successfully defending those sea lanes upon which it relies. Mr. Giarra testified to the Commission that “China has very limited ability to respond to large-scale threats to Chinese shipping in the Strait of Malacca and distant reaches of the South China Sea.”¹⁴⁷ Gabriel B. Collins, a research fellow at the U.S. Naval War College’s China Maritime Studies Institute, and William S. Murray, a professor at the same institute, list the PLA Navy’s lack of access to regional ports for supplies and repair, lack of at-sea replenishment vessels, and lack of long-distance training as hindrances to its ability to defend those sea lanes that China is reliant upon.¹⁴⁸

Not all western analysts believe that sea lane security is a valid worry for China’s leadership. According to the research of Mr. Collins and Mr. Murray, it is unlikely that any military—including the U.S. military—would or could impose an energy blockade on China. They believe that any attempted blockade would likely fail and possibly result in negative global economic and political ramifications.¹⁴⁹ However, regardless of the chance of a successful blockade, Beijing’s “perceived dependence and vulnerability . . . are bound to have real psychological effects on strategic planning.”¹⁵⁰ The ongoing PLA Navy counterpiracy escort mission off the Horn of Africa demonstrates that Beijing and its navy are serious about being capable of defending their international sea lanes (for more on China’s counterpiracy mission, see sec. 1 of this chapter).

Develop China’s Sea-based Nuclear Deterrence Capability

A less-discussed but still key reason for China’s naval modernization is Beijing’s desire to have an operational, submarine-based, nuclear deterrent force. According to Mr. Cooper, the goal is to “improve the deterrent impact of Beijing’s nuclear counterstrike strategy.”¹⁵¹ China has clearly articulated this goal in each of its biennially published defense white papers released since 2004. Each paper states that the PLA Navy is attempting to enhance its nuclear deterrent capability.¹⁵² The first defense white paper to mention this, in 2004, was also the year that China launched the first of its new, nuclear-powered ballistic missile submarines (discussed in further detail below).

Properly Represent China on the International Stage

A final reason for China’s naval modernization is the desire within China for a modern navy. As Rear Admiral McDevitt told the Commission, Beijing wants to “field a military establishment worthy of a great power.” Similarly, Peter A. Dutton, an associate professor at the U.S. Naval War College, testified that there is a sense of pride and nationalism within China regarding its naval modernization. Mr. Dutton specifically referred to the PLA Navy’s likely aircraft carrier program as partially driven by China’s growing naval pride.¹⁵³ National pride or prestige also is a potential reason for China’s desire to develop an at-sea nuclear deterrent force.¹⁵⁴ An example of China’s naval pride was evident in the PLA Navy commander’s May 2009 speech describing the success of the navy’s first task group dispatched to conduct counterpiracy escort mis-

sions off the Horn of Africa. In this speech, Admiral Wu Shengli stated that

[t]his [escort mission] fully demonstrated the fine behavior of our country as a responsible large country, demonstrated the fine image of our armed forces as a mighty and civilized force for peace; demonstrated the perfect military and political quality of the People's Navy, the brilliant achievements of its development and building, and its firm determination to safeguard our national development interests; and demonstrated the navy's brand-new achievements in its Military Combat Preparations and Army Building in recent years.¹⁵⁵

The Three Pillars of China's Naval Modernization

In order to fulfill the above requirements, Beijing has been seeking to develop and reform all facets of the PLA Navy in order to make it into a modern, capable force. This modernization process can best be understood using the "Three Pillars" method. According to David M. Finkelstein, vice president of CNA and director of its China Studies division, China's military modernization rests upon three crucial aspects, which he terms the "Three Pillars:"

- *Materiel modernization*, including the development and procurement of new weapons, equipment, platforms, and systems;
- *Institutional modernization*, including systemic changes, such as organizational, personnel, and training reforms (among other things);
- *Doctrinal modernization*, including the development of new operational concepts and combat techniques.¹⁵⁶

This Report will use this paradigm to assess China's various naval modernization efforts.

The Materiel Pillar

China has substantially modernized its naval fleet and related equipment through a combination of indigenous production and foreign procurement. Since 2001, the PLA Navy has acquired diverse types of capable surface vessels, submarines, and naval aircraft.* All indications are that China is developing an aircraft carrier program. In preparation for supporting these new platforms, China has also acquired or developed new offensive and defensive weapons systems, such as antiship, land-attack, and supersonic cruise missiles; sea mines; and advanced torpedoes. The Chinese navy also has procured several significant naval-related systems, including command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) assets as well as early warning systems. In addition, China is also developing a nascent antiship ballistic missile program, which, although ostensibly controlled by the PLA's Second Artillery (Strategic Rocket) forces,

*The year 2001 was selected as the starting point for Chinese naval modernization, since this is when China's 10th Five-Year Plan (2001–2005) began. For China, Five-Year Plans represent plans where the CCP maps strategies for national development in various areas, including military development. Selecting this year also allows the reader to better understand the breadth of China's naval modernization, since these efforts take years to reach fruition.

could have significant naval implications if successfully developed. China's large-scale naval modernization shows no signs of ebbing, either, as the PLA Navy commander recently laid out ambitious goals concerning the navy's development over the next 10 years:

*We are going to strengthen the development of key weapons and equipment, develop large surface combat vessels, new types of submarines with good underwater endurance and stealthy characteristics, combat aircraft that cruise at supersonic speeds, powerful long-range missiles with precision penetration capabilities, very deep and high-speed smart torpedoes, electronic warfare equipment with good general-purpose and compatibility features, and other such new generation weapons and equipment, enabling the quality and performance of the new generation of weapons and equipment to ascend to new heights.*¹⁵⁷

Submarines: According to Rear Admiral McDevitt, China's submarine forces are a "pocket of excellence" within the PLA Navy.¹⁵⁸ Chinese submarine development is of two types: attack and nuclear-powered ballistic missile. Attack submarines account for the bulk of new submarines in China's fleet. Mr. Cooper testified that China primarily relies upon its growing attack submarine fleet "[f]or sea denial and control operations in and just beyond [China's] littoral waters."¹⁵⁹ As the table below shows, China has acquired at least 22 modern attack submarines since 2001.* Eight of these are diesel *Kilo*-class attack submarines purchased from Russia. Two other submarines, both *Shang*-class, are nuclear powered, which allows for longer patrol ranges and much higher speeds.¹⁶⁰ In addition, China has developed the *Yuan* and *Song*-class, two comparatively quiet diesel submarines. China's attack submarines are variously armed with antiship, land-attack, and supersonic cruise missiles; wake-homing torpedoes, and sea mines.¹⁶¹ Besides the obvious danger that the greater number of Chinese submarines poses to opposing navies, their improved quality increases the difficulty for an opposing force to detect and track them.¹⁶²

New PLA Navy Submarines since 2001	
Attack Submarines	
<i>Shang</i> (nuclear powered)	2
<i>Kilo</i> (diesel, Russian-made)	8
<i>Yuan</i> (diesel)	2
<i>Song</i> (diesel)	10
Ballistic Missile Capable Submarines	
<i>Jin</i> (nuclear powered)	2

Source: Ronald O'Rourke, "China's Naval Modernization: Implications for U.S. Navy Capabilities—Background Issues for Congress" (Washington, D.C.: Congressional Research Service, July 17, 2009), p. 7.

The second type of submarine that the PLA Navy has developed since 2001 is a nuclear-powered ballistic missile submarine, the

* In addition to these 24, the PLA Navy also acquired one *Song*-class submarine and two older *Ming*-class submarines. However, all three were likely planned and developed prior to the tenth Five-Year Plan, since they were officially launched in 2001 or 2002. Therefore, they are not counted for the purposes of this Report.

Jin-class. Currently, China has built two such submarines, both of which have yet to be commissioned.* The U.S. Department of Defense estimates that the PLA Navy will eventually produce up to five such submarines, which, when fully deployed, will give Beijing its first “credible sea-based nuclear strike capability.”¹⁶³ As discussed more fully below, the submarine-launched ballistic missile intended for the *Jin*-class submarine has yet to be successfully tested.

Surface combatants: After submarines, large surface combatants, such as destroyers and frigates, are the second key component of the PLA Navy’s antiaccess strategy.¹⁶⁴ As the table below demonstrates, since 2001 the navy has acquired eight new destroyers spread over four classes: three classes are indigenously produced, and one—the *Sovremenny*-class—was purchased from Russia. The Chinese-made destroyers are “substantially more modern in terms of their hull designs, propulsion systems, sensors, weapons, and electronics” than previous domestically produced destroyers.¹⁶⁵ These vessels were designed to greatly improve previous PLA Navy weaknesses in air defense and are armed with highly capable, anti-ship cruise missiles.¹⁶⁶

New PLA Navy Surface Combatants since 2001	
Destroyers	
<i>Luyang I</i>	2
<i>Luyang II</i>	2
<i>Luzhou</i>	2
<i>Sovremenny II</i> (Russian-built)	2
Frigates	
<i>Jiangwei II</i>	5
<i>Jiangkai I</i>	2
<i>Jiangkai II</i>	4
Fast-attack Craft	
<i>Houbei</i>	40+

Sources: Ronald O’Rourke, “China’s Naval Modernization: Implications for U.S. Navy Capabilities—Background Issues for Congress” (Washington, D.C.: Congressional Research Service, July 17, 2009), pp. 11–13.

Since 2001, the PLA Navy has also approved production of three new frigate classes (including one variant), building 11 frigates so far. These new frigates have improved air defenses, while the most recent two classes, the *Jiangkai I and II* class, also employ stealth design technology.¹⁶⁷ The *Jiangkai II*-class frigate likely will be built in sufficient numbers to become a key vessel of the navy.¹⁶⁸

In addition to producing large surface combatants, China has also emphasized production of small, fast-attack craft. In 2004, China introduced a new type of fast-attack craft, the *Houbei*-class, and has since built at least 40. These fast-attack craft have a stealthy, catamaran hull design and are armed with highly capable antiship cruise missiles.¹⁶⁹ According to Mr. Cooper’s testimony to the Commission,

* China also has an older ballistic missile submarine, the *Xia*-class. However, this submarine, of which only one was ever built, has reportedly never completed an actual deterrent patrol due to technical problems. See Andrew Erickson and Michael Chase, “China’s SSBN Forces: Transitioning to the Next Generation,” *China Brief* 9, no. 12 (June 12, 2009): 10.

[T]he Houbei-class fast-attack craft is an excellent example of an asset that supports a range of missions: it is a highly capable littoral warfare platform with missiles that can support combat operations in a Taiwan theater or a South China Sea conflict, as well as anti-access or area denial operations against U.S. or allied forces.¹⁷⁰

Amphibious ships: As the table below shows, the PLA Navy has built a large number of amphibious ships and landing craft since 2001. The largest, a *Yuzhao*-class amphibious ship, is the first of a possible six ships of this class. In addition to being employed in a cross-Strait scenario, these vessels could also be used to conduct amphibious landings, humanitarian or disaster relief activities, evacuation operations, and maritime security operations far from China's shores.¹⁷¹ Finally, in August 2009, the Russian press reported that Ukraine has agreed to sell China four *Zubr*-class heavy assault hovercraft, providing China with additional amphibious capacity. Two of the four vessels are to be built in China, possibly providing the technological know-how for a much larger fleet in the future.¹⁷²

New PLA Navy Amphibious Ships since 2001	
Amphibious Ships	
<i>Yuzhao</i>	1
<i>Yuting II</i>	10
<i>Yunshu</i>	10
<i>Yubei</i>	10

Sources: Ronald O'Rourke, "China's Naval Modernization: Implications for U.S. Navy Capabilities—Background Issues for Congress" (Washington, D.C.: Congressional Research Service, July 17, 2009), p. 13; U.S.-China Economic and Security Review Commission, *Hearing on the Implications of China's Naval Modernization for the United States*, written testimony of Richard D. Fischer Jr., June 11, 2009; and Stephen Saunders, ed., *Jane's Fighting Ships 2008-2009* (Alexandria, VA: Jane's Information Group, 2008).

Mine warfare ships: In recent years, the PLA Navy has also increased its mine warfare capabilities by building several new mine warfare ships.* These new vessels are paralleled by an active mine warfare research program in China. Recently, three professors from the China Maritime Studies Institute, U.S. Naval War College, concluded their research on Chinese mine warfare by stating that

[I]t now seems that China is engaged in a significant effort to upgrade its mine warfare prowess ... Relying heavily on sea mines, the [PLA Navy] is already fully capable of blockading Taiwan and other crucial [sea lanes] in the Western Pacific.¹⁷³

* In addition to these specific mine-laying vessels, the Chinese military can use "surface warships, submarines, aircraft, and civilian merchant and fishing vessels" to deliver its vast arsenal of sea mines. Andrew S. Erickson, Lyle J. Goldstein, and William S. Murray, "Chinese Mine Warfare: A PLA Navy 'Assassin's Mace' Capability," *China Maritime Studies* 3 (June 2009): 25.

New PLA Navy Mine Warfare Ships since 2001	
Mine Warfare Ships	
<i>Wozang</i>	1
<i>Wochi</i>	5

Source: Stephen Saunders, ed., *Jane's Fighting Ships 2008–2009* (Alexandria, VA: Jane's Information Group, 2008), pp. 147–48.

Auxiliaries: In 2002 and 2003, the PLA Navy built two *Fuchi*-class modern underway replenishment ships, improving its at-sea replenishment capabilities. These ships accompanied Chinese combatants on port calls to Europe and Asia and supported China's antipiracy escort operations in the Gulf of Aden. A smaller supply ship, the *Danyao*-class, was completed in 2006 and is likely intended for supplying Chinese outposts in the South China Sea.¹⁷⁴ Further increases to China's logistics support fleet can be expected, as the PLA Navy commander's statement of April 2009 suggests:

*[Over the next 10 years] we will . . . further improve our mobile support capabilities at sea, and strengthen the transport and supply forces at sea, with the priority being on large auxiliary vessels.*¹⁷⁵

New PLA Navy Auxiliaries since 2001	
Replenishment Ships	
<i>Fuchi</i>	2
<i>Danyao</i>	1
Hospital Ships	
<i>Anwei</i>	1

Source: Stephen Saunders, ed., *Jane's Fighting Ships 2008–2009* (Alexandria, VA: Jane's Information Group, 2008), pp. 152–55.

At the end of 2008, China launched a new hospital ship. According to the U.S. Department of Defense, this vessel will provide the PLA Navy with improved at-sea medical response capabilities. In addition, it may also improve China's ability to support humanitarian and disaster relief efforts throughout the region.¹⁷⁶

Aircraft carriers: Although the PLA Navy currently does not have an operational aircraft carrier, recent Chinese public statements regarding the navy's desire to build one suggest that China is moving toward building an aircraft carrier in the near future.¹⁷⁷ In March 2009, for example, Chinese Defense Minister General Liang Guanglie stated during a meeting with Japan's minister of Defense that China cannot remain "without an aircraft carrier indefinitely."¹⁷⁸ That same month, in a National People's Congress session, Vice Admiral Xu Hongmeng, commander of China's East Sea Fleet, stated that China would have its own aircraft carrier "very soon."¹⁷⁹ In April 2009, the PLA Navy commander also said that China is going to "develop large surface combat vessels" in the near future, a possible oblique reference to future Chinese aircraft carriers.¹⁸⁰

Most western observers of the PLA Navy anticipate that China's potential carrier fleet will be small in number. In March 2009, the Commission received testimony from Michael R. Auslin, a resident

scholar in foreign and defense policy studies at the American Enterprise Institute, that China was likely looking to build a three-carrier navy for the near future.¹⁸¹ Richard D. Fisher Jr., a senior fellow for Asian Military Affairs at the International Assessment and Strategy Center, presented a higher number, possibly four to five carriers by 2020.¹⁸² Similarly, Mr. Cooper testified that China is unlikely to transition to a full, carrier-based navy in the near term due to the prohibitive costs. More likely, he said, China will seek to create a “hybrid” navy composed of a limited number of carriers “designed to provide force projection for regional contingencies or a show of presence in distant sea lanes.”¹⁸³

Naval aviation: Unlike other areas of naval modernization, PLA naval aviation forces have received but a slight increase in resources since 2001, making them the navy’s “least capable warfare community.”¹⁸⁴ In 2004, the PLA Navy received 24 Su-30 Mkk2, a capable Russian-made fighter bomber. Although additional orders were anticipated, as of yet they have failed to materialize.¹⁸⁵ Some reports indicate that the Chinese military may instead purchase the Russian SU-33 carrier-based fighters to be used on a future aircraft carrier.¹⁸⁶ However, to date there has been no public announcement of a contract between Beijing and Moscow to purchase these aircraft. In addition to foreign procurement, China indigenously produced 18 JH-7A fighter bombers for its navy in 2004.¹⁸⁷ While both the Su-30 Mkk2 and the JH-7A are the most modern of China’s naval fighters, their overall numbers are still small (13 percent) compared to the total number of PLA Navy fighters (322).¹⁸⁸ According to Mr. Fisher, the navy may also have recently acquired an unknown number of H-6M bombers, a newer version of China’s indigenous bomber based on an older Soviet design.¹⁸⁹ The PLA Navy has also begun to reinforce its early warning capabilities by developing upgraded variants of Chinese airborne early warning systems, such as the KJ-2000 early warning and control aircraft.¹⁹⁰

New PLA naval aircraft since 2001	
Aircraft	
Su-30 MKK2 fighter bomber	24
JH-7A fighter bomber	18
H-6M bomber	unknown
KJ-2000 airborne early warning and control aircraft	2

Sources: U.S.-China Economic and Security Review Commission, *Hearing on the Implications of China’s Naval Modernization for the United States*, testimony of Richard D. Fischer Jr., June 11, 2009; Richard D. Fisher Jr. (senior fellow for Asian Military Affairs at the International Assessment and Strategy Center), e-mail communication with Commission staff, August 27, 2009; and Stephen Saunders, ed., *Jane’s Fighting Ships 2008–2009* (Alexandria, VA: Jane’s Information Group, 2008), pp. 139–140.

Naval missiles: The PLA Navy currently has a well-developed arsenal of missiles. This section will discuss the Chinese navy’s anti-ship and land-attack cruise missiles and submarine-launched ballistic missiles. This section will also discuss the PLA’s antiship ballistic missile program—ostensibly controlled by the PLA’s Second

Artillery (Strategic Rocket) Forces, because of its clear naval implications.¹⁹¹

- *Antiship cruise missiles:* China has a substantial quantity of antiship cruise missiles that can be launched from a variety of platforms—including aircraft, surface combatants, submarines, and possibly even land-based launchers.¹⁹² While China’s most capable cruise missiles—the supersonic “Sizzler” and “Sunburn”—are of Russian origin, Chinese defense industries have become “sufficiently self-reliant” at producing moderately advanced cruise missiles.¹⁹³ China’s antiship cruise missile capability allows it to conduct a more efficient antiaccess strategy.¹⁹⁴
- *Land-attack cruise missiles:* The Chinese also possess a variant of a short-range cruise missile that can be launched from land, air, or sea—including possibly from submarines.¹⁹⁵ The U.S. Department of Defense reported that these missiles could be used to “threaten regional bases, logistics, and support infrastructure.”¹⁹⁶
- *Submarine-launched ballistic missiles:* The PLA Navy is currently developing the JL-2, a submarine-launched ballistic missile, to be deployed on the navy’s newest nuclear-powered ballistic missile submarines, the *Jin*-class (see above). Although this missile has not yet been successfully tested, the U.S. Department of Defense anticipates that it will have a range of at least 7,200 kilometers.¹⁹⁷ When operational, this missile will allow Chinese submarines for the first time to target the continental United States from operating areas located near the Chinese coast.¹⁹⁸
- *Antiship ballistic missiles:* The PLA is developing a conventionally armed antiship ballistic missile. According to the U.S. Department of Defense, this missile will have a likely range of 1,500 kilometers, be armed with maneuverable warheads, and is intended to deny regional access to surface ships of the opposing side.¹⁹⁹ When combined with appropriate surveillance and targeting sensor systems, this missile could have the potential to destroy or disable aircraft carriers and their associated battle groups while in transit.²⁰⁰ Mr. Giarra testified to the Commission that the U.S. Navy currently lacks adequate defense mechanisms, making this weapon what he called a potential “game changer” for naval warfare in the region.²⁰¹

Maritime military systems: PLA Navy top officials have strongly emphasized the need to enhance elements of its C4ISR systems. In April 2009, the PLA Navy commander stated that the navy’s first modernization priority is to develop its early warning systems. Commander Wu also stated that the navy must establish a joint command model that will integrate “shore, sea, and air [components], and achieve digital linkage between command information systems and equipment platforms.”²⁰² The following month, the PLA Navy chief of staff wrote how naval reconnaissance, early warning, and command and control capabilities must be improved.²⁰³

Over the past few years, the PLA Navy has taken concrete steps to improve its C4ISR systems. Ronald O’Rourke, a naval expert at the Congressional Research Service, testified to the Commission in

June that “China reportedly is developing or deploying maritime surveillance and targeting systems” based on a variety of advanced technologies.²⁰⁴ In addition, Mr. Cooper stated that China’s “[e]ssential C4ISR capabilities such as joint command and control, long-range surveillance and reconnaissance, maritime area air defenses, and a joint targeting architecture probably will be in place between 2015 and 2020.”²⁰⁵

An improved C4ISR system will greatly bolster China’s naval capabilities, since early warning and command and control are continuing weaknesses of the PLA Navy.²⁰⁶ Correcting this weakness—particularly in the maritime domain—will allow Beijing to carry out operations against approaching maritime forces, using a myriad of capabilities.²⁰⁷ The U.S. Department of Defense maintains that improvements in “China’s space-based reconnaissance and positioning, navigation, and timing, as well as survivable terrestrial over-the-horizon targeting” will enhance the PLA’s ability to conduct precision strikes.²⁰⁸ Mr. Cooper told the Commission that such capabilities also will provide the navy with the ability to conduct operations farther out at sea, possibly in the Malacca Strait, the Indian Ocean, and perhaps even the Persian Gulf.²⁰⁹

The Institutional Pillar

Although harder to quantify and evaluate than more easily observed materiel developments, reforms on the soft side of China’s navy are equally important. In order properly to operationalize its growing collection of modern platforms, weapons, and equipment, China also needs to improve the way in which this new hardware is operated.²¹⁰ To this extent, over the past few years, the PLA Navy has implemented several institutional reforms, which can be divided into four areas: personnel, organizational, training, and logistics. Each of these will be discussed in turn.

Personnel reforms: According to Rear Admiral McDevitt,

*The leadership of the PLA recognizes that to achieve their vision of . . . a high-tech military that’s able to operate modern and sophisticated weapon systems, they need to have a professional military that is more carefully balanced toward professionalism while not losing sight of Party loyalty and fealty.*²¹¹

To that end, the PLA Navy has implemented a series of personnel reforms, including increasing the minimum criteria for officer and enlisted entry, creating a noncommissioned officer corps, improving the education levels of the sailors and officers, and raising pay in order to retain more of its qualified personnel.²¹² According to Mr. Vellucci, the PLA Navy is changing how it recruits its officers in order to acquire people who are more technologically proficient, better educated, loyal to the Communist Party, and who have diverse practical experiences. One way the navy is accomplishing this goal, said Mr. Vellucci, is by increasing the number of officers directly recruited from civilian colleges, thus raising the educational level of incoming officers.²¹³ In addition to recruitment reforms, the navy has also been reforming the way it conducts professional military education for its commanding officers in order to

better prepare them for modern warfare, Senior Captain Yan Juejin, commandant of the PLA Navy Branches Command Academy, stated in an April 2009 article.²¹⁴

Military training reforms: According to both China's 2006 and 2008 defense white papers, reforming military training is a priority for the PLA Navy.²¹⁵ Rear Admiral McDevitt stated that in order to do this, the navy has increased the rigor of its operational training, strengthened its methods for evaluating training, and bolstered the realistic nature of its training.²¹⁶ Additional goals include standardizing training throughout the navy and increasingly relying on specialized training facilities, thus further improving training results.²¹⁷ In an April 2009 interview, the PLA Navy commander listed three accomplishments of the navy's training reform since 2001: 1) an increase in the realism of naval training, 2) an improvement in combat techniques, and 3) a routinization of training far out at sea.²¹⁸

Organizational reforms: As stated in China's 2004 and 2006 defense white papers, the PLA has implemented several organizational reforms in an attempt to streamline the navy and improve its capabilities to conduct modern combat operations.* For example, the 2004 defense white paper mentioned how the PLA Navy "compressed its chain of command and reorganized its combat forces in a more scientific way while giving prominence to the building of maritime combat forces—especially amphibious combat forces."²¹⁹ The 2006 defense white paper listed organizational reforms aimed at improving the command structure of naval aviation units and naval bases.²²⁰

Logistics and supply reforms: Closely related to its organizational reform, the PLA Navy has sought to reform its logistics system in order to improve its capabilities to conduct maritime operations, as stated in China's 2004, 2006, and 2008 defense white papers.²²¹ Demonstrating the progress made to date, the 2008 version states that

*[the PLA Navy] is in the first stages of constructing a logistics support system with shore bases as the foundation and maritime logistics as the focal point, meshing the two into one. It has stepped up the building of ship bases, berthing supply points, docks, and airfields; thus basically forming a shore-based support system that is coordinated with the development of weaponry and equipment, and suited to war-time support tasks.*²²²

Over the past few years, the PLA Navy has been constructing or expanding five naval bases, including an underground submarine base on the southern side of Hainan Island, in the South China Sea. When completed, these bases will increase the navy's logistics capabilities.²²³ According to an April 2009 article in the *China Daily*, China's official English-language newspaper, "This network of naval bases, airports and ammunition supply systems have enabled the navy to conduct missions further offshore [sic]."²²⁴ Mr. Cooper testified that the high costs of these endeavors "indicate the importance that China's leaders place on providing a solid logistical

*Organizational restructuring was not mentioned in the 2008 defense white paper.

foundation for growing mission[s].”²²⁵ Some analysts have pointed out that, in addition to developing these domestic naval bases, China has bolstered its commercial investments in, and development of, foreign ports in the Indian Ocean region as possible logistical hubs for future PLA Navy operations.²²⁶ These parts include Chittagong, Bangladesh; Gwadar, Pakistan; Hambantota, Sri Lanka; and Sittwe, Burma.

The Doctrinal Pillar

Outside access to official PLA Navy (and PLA) doctrinal writing is very rare through open sources, thus limiting western analysts’ understanding of this important guidepost to China’s military modernization. However, one trend that continually appears is that the navy is likely to expand its operational range. As early as 2004, President Hu explicitly called upon the navy to defend China’s interests farther out at sea, not just along its littoral areas as before.²²⁷ China’s 2006 defense white paper maintained that the navy “aims at the gradual extension of the strategic depth for offshore defensive operations.”²²⁸ The 2008 version similarly claimed an expanded range for the navy, stating that it “has been striving . . . to gradually develop its capabilities of conducting cooperation in distant waters”—a reference to China’s ongoing antipiracy escort operations in the Gulf of Aden, Africa.²²⁹ The PLA Academy of Military Science illustrated how this naval expansion is tied to China’s growing economy:

*Along with the continued growth of our economic power and our scientific and technical level, [our] naval forces will further expand, and our operational sea area will gradually expand out into the northern part of the Pacific until the second island chain.*²³⁰

Implications for the United States

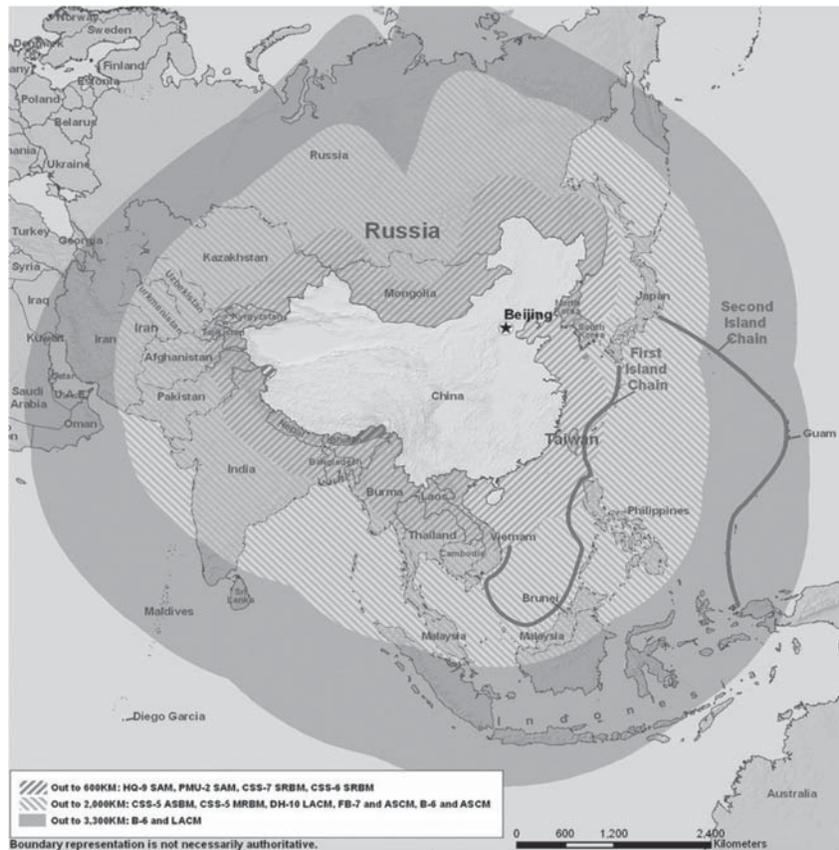
China’s naval modernization will likely have serious implications for the United States. First, as the PLA Navy continues to increase its maritime capabilities, Beijing will improve its capacity to inhibit U.S. access to the region in the event of a crisis. As Admiral Michael Mullen, chairman of the Joint Chiefs of Staff, stated in May 2009, China is “developing capabilities that are very maritime-focused . . . and, in many ways, very much focused on [the United States].”²³¹ According to Rear Admiral McDevitt, “China has adopted a military concept of operations aimed at keeping an approaching force from closing to within striking range of the Chinese mainland and the Taiwan Strait.”²³² In addition to targeting at-sea forces, China’s antiaccess strategy also threatens regional land bases, such as the U.S. forward-deployed bases on Okinawa and Guam.²³³ The maritime portion of this antiaccess strategy can be summarized as follows:

- Endanger large surface ships, including aircraft carriers.
- Deny an opponent the use of regional bases.
- Threaten an opponent’s airborne aircraft.²³⁴

As China strengthens its antiaccess capabilities, it may hinder the U.S. military’s ability to operate in the region.²³⁵ Mr. Cooper

testified to the Commission that “[Chinese] threats to U.S. freedom of movement and action in Asia include conventional, long-range strike threats to U.S. bases and maritime formations, and counter-C4ISR threats to U.S. forces’ ‘eyes and ears.’”²³⁶ The Science Applications International Corporation’s report drafted for the Commission further demonstrated China’s growing antiaccess capability, stating that Chinese cruise missiles fired from forward-deployed air or sea platforms could potentially hit targets as far away as Guam. Such a capability would “effectively limit U.S. military operations from mainland Japan, Okinawa, the Philippines, and all of the Senkaku islands ... [and] potentially force U.S. aircraft carriers to adopt ‘safe operating zones’ out to as much as 1,000 miles off the Chinese mainland.”²³⁷ (See map below.)

Figure 2: China’s Conventional Antiaccess Capabilities



Source: Office of the Secretary of Defense, *Annual Report to Congress: Military Power of the People’s Republic of China, 2009* (Washington, D.C.: U.S. Department of Defense, 2009), p. 23. The “first island chain” represents a line of islands running from Japan, the Senkaku (Diaoyu) Islands, Taiwan, and the west coast of Borneo to Vietnam. The “second island chain” denotes the set of islands that run in a north-south line from Japan, the Bonin (Osagawara) Islands, the Mariana Islands, and Indonesia.

It is important, however, to distinguish intent from capability. Although Beijing may desire the ability to prevent the United States from intervening on behalf of Taiwan (or any other nation) in the event of a conflict with China, it is not clear whether the PLA is capable of such an endeavor. Instead, according to Rear Admiral McDevitt, as China's antiaccess capabilities increase, U.S. military capabilities will likely grow apace, allowing the United States to maintain the "delta of advantage" it currently enjoys for "the next four to five years."²³⁸

A second implication for the United States is that China's new naval capabilities could impact other Asian states, including key U.S. allies and friends, and possibly provoke a naval arms race in the region. Rear Admiral McDevitt told the Commission that China's military modernization, ostensibly defensive in nature, "is creating a dynamic that, as its security situation improves, it is making the security environment for many of its neighbors worse."²³⁹ Recent official government publications and statements from states in the region demonstrate the growing apprehension with which they view China's naval modernization. For example, in May 2009, Australia released a defense white paper that stated that China's military modernization was of potential concern to regional states due to the PLA's lack of transparency.²⁴⁰ Two months later, Japan's Ministry of Defense also released a defense white paper that went even further, identifying China's military modernization as a primary factor for Japan to increase its military investment.²⁴¹ At a March 2009 conference on South China Sea issues, a foreign policy research institute within the Vietnamese Foreign Affairs Ministry cited China's military modernization as a key factor for modernizing Vietnam's military.²⁴² Finally, in its 2008 annual report, India's Ministry of Defence pointed to the Chinese goal of improving the PLA Navy's strategic depth, articulated in China's 2006 defense white paper, as affecting India's security environment.²⁴³

Signs of a naval arms race within the region can already be seen. Australia, for example, seeks to double its submarine fleet from six to 12; modernize its surface combatants; acquire a satellite to improve its intelligence, surveillance, and reconnaissance capabilities; and purchase approximately 100 F-35A Joint Strike Fighters by 2030.²⁴⁴ Vietnam in early 2009 contracted with Russia to purchase six *Kilo*-class attack submarines and 12 Russian Su-30MK2 fighter jets.²⁴⁵ India has also begun a large-scale naval modernization program that includes constructing a new aircraft carrier, purchasing three new stealth frigates from Russia and six long-range maritime surveillance aircraft from the United States, and launching a new surveillance satellite intended for coastal defense and naval applications.²⁴⁶ The Indian Navy also has made a concerted effort to modernize its submarine fleet; for example, in the past several years, India has built six attack submarines; leased two Russian nuclear submarines; and in July 2009, launched its first Russian-designed and indigenously constructed ballistic missile nuclear submarine.²⁴⁷ Other Asian maritime nations seeking to increase their submarine forces include Indonesia, Malaysia, Singapore, and South Korea.²⁴⁸

Conclusions

- Since the mid-1990s, China, enabled by its growing economy, has embarked on its largest naval modernization effort since the founding of the PRC in 1949. This modernization process includes foreign purchases and indigenous production of naval platforms, weapons, and equipment. In addition, institutional changes such as organizational, personnel, and logistics reforms have improved the PLA Navy's capacity to conduct operations.
- Deterring Taiwan from declaring independence is the near-term goal of this modernization process. A key component is the necessity to impede other nations—including the United States—from intervening on Taiwan's behalf.
- Other reasons driving China's naval modernization include the need to protect China's economic-intense coastal regions from maritime attacks, assert its maritime sovereignty and regional economic interests, safeguard its access to international sea lanes, provide a credible at-sea nuclear deterrent, and satisfy a national desire for a powerful navy.
- As China's naval modernization efforts progress, China increasingly will be able to project power in East Asia and interfere with U.S. freedom of access to the region. China's antiaccess strategy hinges upon deploying a powerful navy on, above, and below the surface, supported by air and missile forces.
- Concern about China's naval modernization is beginning to fuel a maritime arms race in the region. Several nations, including close U.S. allies, have recently officially questioned PLA and PLA Navy modernization efforts. Already a few nations have even begun to augment their own navies by purchasing naval platforms and weapons.