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

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Summary

In an era of renewed great power competition, China's military modernization effort, including its naval modernization effort, has become the top focus of U.S. defense planning and budgeting. China's navy, which China has been steadily modernizing for more than 25 years, since the early to mid-1990s, has become a formidable military force within China's near-seas region, and it is conducting a growing number of operations in more-distant waters, including the broader waters of the Western Pacific, the Indian Ocean, and waters around Europe.

China's navy is viewed as posing a major challenge to the U.S. Navy's ability to achieve and maintain wartime control of blue-water ocean areas in the Western Pacific—the first such challenge the U.S. Navy has faced since the end of the Cold War—and forms a key element of a Chinese challenge to the long-standing status of the United States as the leading military power in the Western Pacific. Some U.S. observers are expressing concern or alarm regarding the pace of China's naval shipbuilding effort, particularly for building larger surface ships, and resulting trend lines regarding the relative sizes China's navy and the U.S. Navy.

China's naval modernization effort encompasses a wide array of ship, aircraft, and weapon acquisition programs, as well as improvements in maintenance and logistics, doctrine, personnel quality, education and training, and exercises. China's navy has currently has certain limitations and weaknesses, and is working to overcome them.

China's military modernization effort, including its naval modernization effort, is assessed as being aimed at developing capabilities for addressing the situation with Taiwan militarily, if need be; for achieving a greater degree of control or domination over China's near-seas region, particularly the South China Sea; for enforcing China's view that it has the right to regulate foreign military activities in its 200-mile maritime exclusive economic zone (EEZ); for defending China's commercial sea lines of communication (SLOCs), particularly those linking China to the Persian Gulf; for displacing U.S. influence in the Western Pacific; and for asserting China's status as the leading regional power and a major world power.

Consistent with these goals, observers believe China wants its navy to be capable of acting as part of a Chinese anti-access/area-denial (A2/AD) force—a force that can deter U.S. intervention in a conflict in China's near-seas region over Taiwan or some other issue, or failing that, delay the arrival or reduce the effectiveness of intervening U.S. forces. Additional missions for China's navy include conducting maritime security (including antipiracy) operations, evacuating Chinese nationals from foreign countries when necessary, and conducting humanitarian assistance/disaster response (HA/DR) operations.

The U.S. Navy in recent years has taken a number of actions to counter China's naval modernization effort. Among other things, the U.S. Navy has shifted a greater percentage of its fleet to the Pacific; assigned its most-capable new ships and aircraft and its best personnel to the Pacific; maintained or increased general presence operations, training and developmental exercises, and engagement and cooperation with allied and other navies in the Indo-Pacific; increased the planned future size of the Navy; initiated, increased, or accelerated numerous programs for developing new military technologies and acquiring new ships, aircraft, unmanned vehicles, and weapons; begun development of new operational concepts (i.e., new ways to employ Navy and Marine Corps forces) for countering Chinese maritime A2/AD forces; and signaled that the Navy in coming years will shift to a more-distributed fleet architecture that will feature a smaller portion of larger ships, a larger portion of smaller ships, and a substantially greater use of unmanned vehicles. The issue for Congress is whether the U.S. Navy is responding appropriately to China's naval modernization effort.

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Introduction

Issue for Congress

This report provides background information and issues for Congress on China's naval modernization effort and its implications for U.S. Navy capabilities. In an era of renewed great power competition,[1] China's military modernization effort, including its naval modernization effort, has become the top focus of U.S. defense planning and budgeting.[2] The issue for Congress for this CRS report is whether the U.S. Navy is responding appropriately to China's naval modernization effort. Decisions that Congress reaches on this issue could affect U.S. and allied security, Navy capabilities and funding requirements, and the defense industrial base.

Sources and Terminology

This report is based on unclassified open-source information, such as the annual Department of Defense (DOD) report to Congress on military and security developments involving China,[3] a 2019 Defense Intelligence Agency (DIA) report on China's military power,[4] a 2015 Office of Naval Intelligence (ONI) report on China's navy,[5] published reference sources such as *IHS Jane's Fighting Ships*,[6] and press reports.

For convenience, this report uses the term China's naval modernization effort 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 (PLA). Its navy is called the PLA Navy, or PLAN (also abbreviated as PLA[N]), and its air force is called the PLA Air Force,

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[1] For further discussion of the shift to an era of renewed great power competition, see CRS Report R43838, *Renewed Great Power Competition: Implications for Defense—Issues for Congress*, by Ronald O'Rourke.

[2] See, for example, Mark Esper, "The Pentagon Is Prepared for China," *Wall Street Journal*, August 24, 2020; Tom Rogan, "Defense Secretary Mark Esper: It's China, China, China," *Washington Examiner*, August 28, 2019; Melissa Leon and Jennifer Griffin, "Pentagon 'Very Carefully' Watching China, It's 'No. 1 Priority,' Defense Secretary Mark Esper Tells Fox News," *Fox News*, August 22, 2019; Missy Ryan and Dan Lamothe, "Defense Secretary Wants to Deliver on the Goal of Outpacing China. Can He Do It?" *Washington Post*, August 6, 2019; Sandra Erwin, "New Pentagon Chief Shanahan Urges Focus on China and 'Great Power Competition,' *Space News*, January 2, 2019; Ryan Browne, "New Acting Secretary of Defense Tells Pentagon 'to Remember China, China, China,'" *CNN*, January 2, 2019; Paul McCleary, "Acting SecDef Shanahan's First Message: 'China, China, China,'" *Breaking Defense*, January 2, 2019.

[3] Department of Defense, *Annual Report to Congress, Military and Security Developments Involving the People's Republic of China 2020*, generated on August 21, 2020, released on September 1, 2020, 173 pp. Hereinafter *2020 DOD CMSD*.

[4] Defense Intelligence Agency, *China Military Power, Modernizing a Force to Fight and Win*, 2019, 125 pp. Hereinafter *2019 DIA CMP*.

[5] Office of Naval Intelligence, *The PLA Navy, New Capabilities and Missions for the 21st Century*, undated but released in April 2015, 47 pp.

[6] *IHS Jane's Fighting Ships 2018-2019*, 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.

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 PLA Rocket Force (PLARF).

This report uses the term *China's near-seas region* to refer to the Yellow Sea, East China Sea, and South China Sea—the waters enclosed by the so-called *first island chain*. The so-called *second island chain* encloses both these waters and the Philippine Sea that is situated between the Philippines and Guam.[7]

Background

Brief Overview of China's Naval Modernization Effort

Key overview points concerning China's naval modernization effort include the following:

- China's naval modernization effort, which forms part of a broader Chinese military modernization effort that includes several additional areas of emphasis,[8] has been underway for more than 25 years, since the early to mid-1990s, and has transformed China's navy into a much more modern and capable force. China's navy is a formidable military force within China's near-seas region, and it is conducting a growing number of operations in more-distant waters, including the broader waters of the Western Pacific, the Indian Ocean, and waters around Europe.
- China's navy is, by far, the largest of any country in East Asia, and within the past few years it has surpassed the U.S. Navy in numbers of battle force ships (meaning the types of ships that count toward the quoted size of the U.S. Navy), making China's navy the numerically largest in the world. Some U.S. observers are expressing concern or alarm regarding the pace of China's naval shipbuilding effort, particularly for building larger surface ships, and resulting trend lines regarding the relative sizes China's navy and the U.S. Navy. ONI states that at the end of 2020, China's will have 360 battle force ships, compared with a projected total of 297 for the U.S. Navy at the end of FY2020. ONI projects that China will have 400 battle force ships by 2025, and 425 by 2030.[9]
- China's naval ships, aircraft, and weapons are now much more modern and capable than they were at the start of the 1990s, and are now comparable in many respects to those of Western navies. ONI states that "Chinese naval ship design

[7] For a map showing the first and second island chains, see *2019 DIA CMP*, p. 32.

[8] Other areas of emphasis in China's military modernization effort include space capabilities, cyber and electronic warfare capabilities, ballistic missile forces, and aviation forces, as well as the development of emerging military-applicable technologies such as hypersonics, artificial intelligence, robotics and unmanned vehicles, directed-energy technologies, and quantum technologies. For a discussion of advanced military technologies, see CRS In Focus IF11105, *Defense Primer: Emerging Technologies*, by Kelley M. Sayler.

U.S.-China competition in military capabilities in turn forms one dimension of a broader U.S.-China strategic competition that also includes political, diplomatic, economic, technological, and ideological dimensions.

[9] Source for China's number of battle force ships: Unclassified ONI information paper prepared for Senate Armed Services Committee, subject "UPDATED China: Naval Construction Trends vis-à-vis U.S. Navy Shipbuilding Plans, 2020-2030," February 2020, p. 3. Provided by Senate Armed Services Committee to CRS and CBO on March 4, 2020, and used in this CRS report with the committee's permission.

and material quality is in many cases comparable to [that of] USN [U.S. Navy] ships, and China is quickly closing the gap in any areas of deficiency."[10]

- China's navy is viewed as posing a major challenge to the U.S. Navy's ability to achieve and maintain wartime control of blue-water ocean areas in the Western Pacific—the first such challenge the U.S. Navy has faced since the end of the Cold War. China's navy forms a key element of a Chinese challenge to the long-standing status of the United States as the leading military power in the Western Pacific.
- China's naval modernization effort encompasses a wide array of platform and weapon acquisition programs, including anti-ship ballistic missiles (ASBMs), anti-ship cruise missiles (ASCMs), submarines, surface ships, aircraft, unmanned vehicles (UVs), and supporting C4ISR (command and control, communications, computers, intelligence, surveillance, and reconnaissance) systems. China's naval modernization effort also includes improvements in maintenance and logistics, doctrine, personnel quality, education and training, and exercises.[11]
- China's military modernization effort, including its naval modernization effort, is assessed as being aimed at developing capabilities for addressing the situation with Taiwan militarily, if need be; for achieving a greater degree of control or domination over China's near-seas region, particularly the South China Sea; for enforcing China's view that it has the right to regulate foreign military activities in its 200-mile maritime exclusive economic zone (EEZ);[12] for defending China's commercial sea lines of communication (SLOCs), particularly those linking China to the Persian Gulf; for displacing U.S. influence in the Western Pacific; and for asserting China's status as the leading regional power and a major world power.[13]
- Consistent with these goals, observers believe China wants its navy to be capable of acting as part of a Chinese anti-access/area-denial (A2/AD) force—a force that can deter U.S. intervention in a conflict in China's near-seas region over Taiwan or some other issue, or failing that, delay the arrival or reduce the effectiveness of intervening U.S. forces. Additional missions for China's navy include conducting maritime security (including antipiracy) operations, evacuating Chinese nationals from foreign countries when necessary, and conducting humanitarian assistance/disaster response (HA/DR) operations.
- Until recently, China's naval modernization effort appeared to be focused less on increasing total platform (i.e., ship and aircraft) numbers than on increasing the modernity and capability of Chinese platforms. Some categories of ships, however, are now increasing in number. The planned ultimate size and

[10] Source: Unclassified ONI information paper prepared for Senate Armed Services Committee, subject "UPDATED China: Naval Construction Trends vis-à-vis U.S. Navy Shipbuilding Plans, 2020-2030," February 2020, p. 3. Provided by Senate Armed Services Committee to CRS and CBO on March 4, 2020, and used in this CRS report with the committee's permission.

[11] See, for example, Roderick Lee, "The PLA Navy's ZHANLAN Training Series: Supporting Offensive Strike on the High Seas," *China Brief*, April 13, 2020.

[12] For additional discussion, see CRS Report R42784, *U.S.-China Strategic Competition in South and East China Seas: Background and Issues for Congress*, by Ronald O'Rourke.

[13] For additional discussion, see Ryan D. Martinson, "Deciphering China's 'World-class' Naval Ambitions," *U.S. Naval Institute Proceedings*, August 2020.

composition of China's navy is not publicly known. In contrast to the U.S. Navy, China does not release a navy force-level goal or detailed information about planned ship procurement rates, planned total ship procurement quantities, planned ship retirements, and resulting projected force levels.

- Although China's naval modernization effort has substantially improved China's naval capabilities in recent years, China's navy currently is assessed as having limitations or weaknesses in certain areas,[14] including joint operations with other parts of China's military, antisubmarine warfare (ASW), long-range targeting, a limited capacity for carrying out at-sea resupply of combatant ships operating far from home waters,[15] a need to train large numbers of personnel to crew its new ships,[16] and a lack of recent combat experience.[17] China is working to reduce or overcome such limitations and weaknesses.[18] Although China's navy has limitations and weaknesses, it may nevertheless be sufficient for performing missions of interest to Chinese leaders. As China's navy reduces its weaknesses and limitations, it may become sufficient to perform a wider array of potential missions.
- In addition to modernizing its navy, China in recent years has substantially increased the size of its coast guard.[19] China's coast guard is, by far, the largest of any country in East Asia. China also operates a sizeable maritime militia that includes a large number of fishing vessels. China relies primarily on its maritime militia and coast guard to assert and defend its maritime claims in its near-seas region, with the navy operating over the horizon as a potential backup force.[20]

Selected Elements of China's Naval Modernization Effort

This section provides a brief overview of elements of China's naval modernization effort that have attracted frequent attention from observers.

[14] For a discussion focusing on these limitations or weaknesses, see Mike Sweeney, *Assessing Chinese Maritime Power*, Defense Priorities, October 2020, 14 pp.

[15] See, for example, Will Mackenzie, "Commentary: It's the Logistics, China," *National Defense*, June 10, 2020.

[16] See, for example, Minnie Chan, "China's Navy Goes Back to Work on Big Ambitions but Long-Term Gaps Remain," *South China Morning Post*, August 22, 2020.

[17] The use of a dual command structure in the crews of larger Chinese ships, involving both a commanding officer and a political officer, has also been raised as a source of potential reduced command effectiveness in certain tactical situations. See "Leadership: China Cripples Naval Officers," *Strategy Page*, July 18, 2020. Some observers argue that corruption in China's shipbuilding companies may be a source of additional weaknesses in China's naval modernization effort. See, for example, Zi Yang, "The Invisible Threat to China's Navy: Corruption," *Diplomat*, May 19, 2020. See also Frank Chen, "Ex-PLA Navy Chief in Deep Water Amid War on Graft," *Asia Times*, June 26, 2020.

[18] For example, China's naval shipbuilding programs were previously dependent on foreign suppliers for some ship components. ONI, however, states that "almost all weapons and sensors on Chinese naval ships are produced in-country, and China no longer relies on Russia or other countries for any significant naval ship systems." (Source: Unclassified ONI information paper prepared for Senate Armed Services Committee, subject "UPDATED China: Naval Construction Trends vis-à-vis U.S. Navy Shipbuilding Plans, 2020-2030," February 2020, pp. 2-3. Provided by Senate Armed Services Committee to CRS and CBO on March 4, 2020, and used in this CRS report with the committee's permission.)

[19] For additional details, see *2020 DOD CMSD*, p. 71, and *2019 DIA CMP*, p. 78.

[20] For additional discussion, see CRS Report R42784, *U.S.-China Strategic Competition in South and East China Seas: Background and Issues for Congress*, by Ronald O'Rourke.

Anti-Ship Missiles

Anti-Ship Ballistic Missiles (ASBMs)

China reportedly is fielding two types of land-based ballistic missiles with a capability of hitting ships at sea—the DF-21D (**Figure 1**), a road-mobile anti-ship ballistic missile (ASBM) with a range of more than 1,500 kilometers (i.e., more than 910 nautical miles), and the DF-26 (**Figure 2**), a road-mobile, multi-role intermediate range ballistic missile (IRBM) with a maximum range of about 4,000 kilometers (i.e., about 2,160 nautical miles) that DOD says "is capable of conducting both conventional and nuclear precision strikes against ground targets as well as conventional strikes against naval targets."[21]

Figure 1. DF-21D Anti-Ship Ballistic Missile (ASBM)

Source: Cropped version of photograph accompanying Andrew S. Erickson, "China's DF-21D Anti-Ship Ballistic Missile (ASBM)—Officially Revealed at 3 September Parade—Complete Open Source Research Compendium," AndrewErickson.com, September 10, 2015, accessed August 28, 2019.

Until recently, reported test flights of DF-21s and SDF-26s have not involved attempts to hit moving ships at sea. A November 14, 2020, press report, however, stated that an August 2020 test firing of DF-21 and DF-26 ASBMs into the South China resulted in the missiles successfully hitting a moving target ship south of the Paracel Islands.[22] A December 3, 2020, press report stated that Admiral Philip Davidson, the commander of U.S. Indo-Pacific Command, "confirmed, for the first time from the U.S. government side, that China's People's Liberation Army has successfully tested an anti-ship ballistic missile against a moving ship."[23] China reportedly is also

[21] *2020 DOD CMSD*, p. 55.

[22] Kristin Huang, "China's 'Aircraft-Carrier Killer' Missiles Successfully Hit Target Ship in South China Sea, PLA Insider Reveals," *South China Morning Post*, November 1,4 2020. See also Peter Suciu, "Report: China's 'Aircraft-Carrier Killer' Missiles Hit Target Ship in August," *National Interest*, November 15, 2020; Andrew Erickson, "China's DF-21D and DF-26B ASBMs: Is the U.S. Military Ready?" *Real Clear Defense*, November 16, 2020.

[23] Josh Rogin, "China's Military Expansion Will Test the Biden Administration," *Washington Post*, December 3, 2020.

developing hypersonic glide vehicles that, if incorporated into Chinese ASBMs, could make Chinese ASBMs more difficult to intercept.[24]

Figure 2. DF-26 Multi-Role Intermediate-Range Ballistic Missile (IRBM)

Source: Cropped version of photograph accompanying Missile Defense Project, "Dong Feng-26 (DF-26)," Missile Threat, Center for Strategic and International Studies, January 8, 2018, last modified January 15, 2019, accessed August 28, 2019.

Observers have expressed strong concerns about China's ASBMs, because such missiles, in combination with broad-area maritime surveillance and targeting systems, would permit China to attack aircraft carriers, other U.S. Navy ships, or ships of allied or partner navies 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. For this reason, some observers have referred to ASBMs as a "game-changing" weapon.

Anti-Ship Cruise Missiles (ASCMs)

China's extensive inventory of anti-ship cruise missiles (ASCMs) (see **Figure 3**, **Figure 4**, and **Figure 5** for examples of reported images) includes both Russian- and Chinese-made designs, including some advanced and highly capable ones, such as the Chinese-made YJ-18.[25] Although China's ASCMs do not always receive as much press attention as China's ASBMs (perhaps because ASBMs are a more-recent development), observers are nevertheless concerned about them. As discussed later in this report, the relatively long ranges of certain Chinese ASCMs have led to concerns among some observers that the U.S. Navy is not moving quickly enough to arm U.S. Navy surface ships with similarly ranged ASCMs.

[24] See, for example, Christian Davenport, "Why the Pentagon Fears the U.S. Is Losing the Hypersonic Arms Race with Russia and China," *Washington Post*, June 8, 2018; Keith Button, "Hypersonic Weapons Race," *Aerospace America*, June 2018.

[25] *2020 DOD CMSD*, p. 59.

Figure 3. Reported Image of Anti-Ship Cruise Missile (ASCM)

Source: Detail of photograph accompanying Pierre Delrieu, "China Promotes Export of CM-302 Supersonic ASCM," *Asian Military Review*, July 3, 2017. (The article states "This is an article published in our December 2016 Issue.") The article states "According to Chinese news media reports, the China Aerospace Science and Industry Corporation(CASIC) CM-302 missile is being marketed for export as "the world's best anti-ship missile." The missile was showcased at the Zhuhai air show in the southern People's Republic of China (PRC) in early November [2016], and is advertised as [a] supersonic Anti-Ship Missile (AShM) [ASCM] which can also be used in the land attack role. The report, published by the national newspaper *China Daily*, suggest[s] that the CM-302 is the export version of CASIC's YJ-12 supersonic AShM, which is in service with the PRC's armed forces.")

Figure 4. Reported Image of Anti-Ship Cruise Missile (ASCM)

Source: Photograph accompanying "YJ-18 Eagle Strike CH-SS-NX-13," GlobalSecurity.org, updated October 1, 2019. The article states "A grand military parade was held in Beijing on 01 October 2019 to mark the People's Republic of China's 70th founding anniversary.… One weapon featured was a new generation of anti-ship missiles called YJ-18. China unveiled YJ-18/18A anti-ship cruise missiles in the National Day military parade in central Beijing.")

Figure 5. Reported Image of Anti-Ship Cruise Missile (ASCM)

Source: Dennis M. Gormley, Andrew S. Erickson, and Jingdong Yuan, *A Low-Visibility Force Multiplier, Assessing China's Cruise Missile Ambitions*, Published by National Defense University Press for the Center for the Study of Chinese Military Affairs, Institute for National Strategic Studies, Washington, D.C., 2014. The image appears on an unnumbered page following page 14. The caption to the photograph states "YJ-83A/C-802A ASCM on display at 2008 Zhuhai Airshow." The photograph is credited to Associated Press/Wide World Photos.

Submarines

Overview

China has been steadily modernizing its submarine force, and most of its submarines are now built to relatively modern Chinese and Russian designs. Qualitatively, China's newest submarines might not be as capable as Russia's newest submarines,[26] but compared to China's earlier submarines, which were built to antiquated designs, its newer submarines are much more capable.

Types and Numbers

Most of China's submarines are non-nuclear-powered attack submarines (SSs). China also operates a small number of nuclear-powered attack submarines (SSNs) and a small number of nuclear-powered ballistic missile submarines (SSBNs). The number of SSNs and SSBNs may grow in coming years, but the force will likely continue to consist mostly of SSs. DOD states that

[26] Observers have sometimes characterized Russia's submarines rather than China's as being the most capable faced by the U.S. Navy. See, for example, Joe Gould and Aaron Mehta, "US Could Lose a Key Weapon for Tracking Chinese and Russian Subs," *Defense News*, May 1, 2019; Dave Majumdar, "Why the U.S. Navy Fears Russia's Submarines," *National Interest*, October 12, 2018; John Schaus, Lauren Dickey, and Andrew Metrick, "Asia's Looming Subsurface Challenge," *War on the Rocks*, August 11, 2016; Paul McLeary, "Chinese, Russian Subs Increasingly Worrying the Pentagon," *Foreign Policy*, February 24, 2016; Dave Majumdar, "U.S. Navy Impressed with New Russian Attack Boat," *USNI News*, October 28, 2014.

"The PLAN will likely maintain between 65 and 70 submarines through the 2020s, replacing older units with more capable units on a near one-to-one basis."[27] ONI states that "China's submarine force continues to grow at a low rate, though with substantially more-capable submarines replacing older units. Current expansion at submarine production yards could allow higher future production numbers." ONI projects that China's submarine force will grow from a total of 66 boats (4 SSBNs, 7 SSNs, and 55 SSs) in 2020 to 76 boats (8 SSBNs, 13 SSNs, and 55 SSs) in 2030.[28]

China's newest series-built SS design is the Yuan-class (Type 039) SS (**Figure 6**), its newest SSN class is the Shang-class (Type 093) SSN (**Figure 7**), and its newest SSBN class is the Jin (Type 094) class SSBN (**Figure 8**). In May 2020, it was reported that two additional Type 094 SSBNs had entered service, increasing the total number in service to six.[29]

Figure 6. Yuan (Type 039) Attack Submarine (SS)

Source: Photograph accompanying "Type 039A Yuan class," SinoDefence.com, July 10, 2018, accessed August 28, 2019.

DOD states that since the mid-1990s, "China's shipyards have delivered 13 Song class SS units (Type 039) and 17 Yuan class diesel-electric air-independent-powered attack submarine (SSP)

[27] *2020 DOD CMSD*, p. 45.

[28] Source: Unclassified ONI information paper prepared for Senate Armed Services Committee, subject "UPDATED China: Naval Construction Trends vis-à-vis U.S. Navy Shipbuilding Plans, 2020-2030," February 2020, p. 1. Provided by Senate Armed Services Committee to CRS and CBO on March 4, 2020, and used in this CRS report with the committee's permission. See also H. I. Sutton, "China Increases Production Of AIP Submarines With Massive New Shipyard," *Naval News*, February 16, 2021; H. I. Sutton, "First Image Of China's New Nuclear Submarine Under Construction," *Naval News*, February 1, 2021.

[29] See, for example, Peter Suciu, "China Now Has Six Type 094A Jin-Class Nuclear Powered Missile Submarines," *National Interest*, May 6, 2020.

(Type 039A/B). The PRC is expected to produce a total of 25 or more Yuan class submarines by 2025."[30] DOD states further:

> Over the past 15 years, the PLAN has constructed twelve nuclear submarines—two Shang I class SSNs (Type 093), four Shang II class SSNs (Type 093A), and six Jin class SSBNs (Type 094), two of which were awaiting entry into service in late 2019. Equipped with the CSS-N-14 (JL-2) submarine-launched ballistic missile (SLBM), the PLAN's four operational Jin class SSBNs represent the PRC's first credible sea-based nuclear deterrent. Each Jin class SSBN can carry up to 12 JL-2 SLBMs.…China's next-generation Type 096 SSBN, which will likely begin construction in the early-2020s, will reportedly carry a new type of SLBM. The PLAN is expected to operate the Type 094 and Type 096 SSBNs concurrently and could have up to eight SSBNs by 2030….
>
> By the mid-2020s, China will likely build the Type 093B guided-missile nuclear attack submarine. This new Shang class variant will enhance the PLAN's anti-surface warfare capability and could provide a clandestine land-attack option if equipped with land-attack cruise missiles (LACMs)."[31]

Figure 7. Shang (Type 093) Attack Submarine (SSN)

Source: Photograph accompanying SinoDefence.com, "Type 093 Shang Class," July 1, 2018, accessed August 27, 2019, at http://sinodefence.com/type093_shang-class/.

Submarine Weapons

China's submarines are armed with one or more of the following: ASCMs, wire-guided and wake-homing torpedoes, and mines. Wake-homing torpedoes can be very difficult for surface

[30] *2020 DOD CMSD*, p. 45.

[31] *2020 DOD CMSD*, p. 45.

ships to decoy. Each Jin-class SSBN is armed with 12 JL-2 nuclear-armed submarine-launched ballistic missiles (SLBMs).[32]

Figure 8. *Jin* (Type 094) Ballistic Missile Submarine (SSBN)

Source: Cropped version of photograph accompanying Minnie Chan, "China Puts a Damper on Navy's 70th Anniversary Celebrations As It Tries to Allay Fears Over Rising Strength," *South China Morning Post*, April 23, 2019. The article credits the photograph to Xinhua.

Aircraft Carriers

Overview[33]

China's first aircraft carrier, *Liaoning* (Type 001) (**Figure 9**), entered service in 2012. China's second aircraft carrier (and its first fully indigenously built carrier), *Shandong* (Type 002) (**Figure 10**) entered service on December 17, 2019. Chinese press reports in October 2020 stated that the ship has completed testing and is scheduled to be "combat ready" by the end of 2020.[34] China's third carrier, the Type 003 (**Figure 11**), is under construction; ONI expects it to enter service by

[32] DOD estimates the range of the JL-2 at 7,200 km (*2020 DOD CMSD*, p. 58). Such a range could permit Jin-class SSBNs to attack targets in Alaska (except the Alaskan panhandle) from protected bastions close to China, targets in Hawaii (as well as targets in Alaska, except the Alaskan panhandle) from locations south of Japan, targets in the western half of the 48 contiguous states (as well as Hawaii and Alaska) from mid-ocean locations west of Hawaii, or targets in all 50 states from mid-ocean locations east of Hawaii.

[33] For an article providing a review of developments in China's aircraft carrier and carrier-based aircraft programs, see Rick Joe, "003 and More: An Update on China's Aircraft Carriers," *Diplomat*, September 29, 2020. Consistent with the discussion in that article, this CRS report uses the following updated designations of China's carriers: China's second aircraft carrier, previously referred to as the Type 001A, is now referred to as the Type 002; the next aircraft carrier design after that, previously referred to as the Type 002, is now referred to as the Type 003, and the potential design that could follow, previously referred to as the Type 003, is now referred to as the Type 004.

[34] Leng Shumei, "China's 2nd Aircraft Carrier Shandong Completes Testing, Training Mission, to be Combat-Ready by Year-End," *Global Times*, October 27, 2020. (A similar report was published as Global Times, "China's 2nd Aircraft Carrier Shandong Completes Testing, Training Mission, to be Combat-Ready by Year-End," *People's Daily Online*, October 28, 2020.)

2024.[35] China's fourth carrier, reportedly also to be built to the Type 003 design, reportedly may begin construction as early as 2021.[36]

Figure 9. *Liaoning* (Type 001) Aircraft Carrier

Source: Cropped version of photograph accompanying China Power Team, "How Does China's First Aircraft Carrier Stack Up?" China Power (Center for Strategic and International Studies), December 9, 2015, updated December 14, 2018, accessed August 28, 2019.

Like *Liaoning* and *Shandong*, the Type 003 carriers are to be conventionally powered. By comparison, U.S. Navy aircraft carriers are nuclear powered (giving them greater cruising endurance than a conventionally powered ship), have a full load displacement of about 100,000 tons, can accommodate air wings of 60 or more aircraft, including fixed-wing aircraft and some helicopters, and launch their fixed-wing aircraft over both their bows and their angled decks using catapults, which can give those aircraft a range/payload capability greater than that of aircraft launched with a ski ramp. The Liaoning, like U.S. Navy aircraft carriers, lands fixed-wing aircraft using arresting wires on its angled deck.

ONI states that "China has two shipyards expected to be used for aircraft carrier production, though several other large commercial yards could, in theory, also build carriers." Observers have speculated that China may eventually field a force of four to six (or possibly more than six) aircraft carriers. In late November 2019, it was reported that the Chinese government, while deciding to proceed with the construction of the fourth carrier, had put on hold plans to build a fifth carrier, known as the Type 004, which was to be nuclear-powered, due to budgetary and

[35] Source: Unclassified ONI information paper prepared for Senate Armed Services Committee, subject "UPDATED China: Naval Construction Trends vis-à-vis U.S. Navy Shipbuilding Plans, 2020-2030," February 2020, p. 4. Provided by Senate Armed Services Committee to CRS and CBO on March 4, 2020, and used in this CRS report with the committee's permission.

[36] Minnie Chan, "Chinese Navy Set to Build Fourth Aircraft Carrier, but Plans for a More Advanced Ship Are Put on Hold," *South China Morning Post*, November 28, 2019.

technical considerations. Observers expect that it will be some time before China masters carrier-based aircraft operations on a substantial scale.

Figure 10. *Shandong* (Type 002) Aircraft Carrier

Source: Photograph accompanying Daniel Brown, "China's Newest Aircraft Carrier Is Actually Very Outdated—But Its Next One Should Worry the US Navy A Lot," *Business Insider*, July 18, 2018. The article credits the photograph to Reuters.

Liaoning (Type 001)

Liaoning is a refurbished ex-Ukrainian aircraft carrier that China purchased from Ukraine in 1998 as an unfinished ship.[37] It is conventionally powered, has an estimated full load displacement of 60,000 to 66,000 tons, and reportedly can accommodate an air wing of 30 or more fixed-wing airplanes and helicopters, including 24 fighters. The *Liaoning* lacks aircraft catapults and instead launches fixed-wing airplanes off the ship's bow using an inclined "ski ramp."

Some observers have referred to the *Liaoning* as China's "starter" carrier. China has been using *Liaoning* in part for pilot training. In May 2018, China reportedly announced that the aircraft carrier group formed around *Liaoning* had reached initial operational capability (IOC),[38] although that term might not mean the same as it does when used by DOD in connection with U.S. weapon systems.

[37] Prior to the dissolution of the Soviet Union in December 1991, Ukraine was a part of the Soviet Union and the place where the Soviet Union built its aircraft carriers.

[38] Andrew Tate, "Liaoning Carrier Group Reaches Initial Operational Capability, *IHS Jane's Defence Weekly*, June 4, 2018. See also Travis Fedschun, "China Says Carrier Group Reaches 'Initial' Combat Capability," *Fox News*, May 31, 2018; "China's First Aircraft Carrier Formation Capable of Systemic Combat Operation," CGTV.com, May 31, 2018; Global Times, "Chinese Aircraft Carrier Forming All-Weather Combat Capability with Successful Night Takeoff and Landing," *People's Daily Online*, May 29, 2018.

Shandong (Type 002)

Shandong is a modified version of the *Liaoning* design that incorporates some design improvements, including features that reportedly will permit it to embark and operate a larger air wing of 40 aircraft that includes 36 fighters.[39] Its displacement is estimated at 66,000 to 70,000 tons.

Type 003 Carriers

Press reports have generally stated that China's Type 003 carriers may have a displacement of 80,000 tons to 85,000 tons. A November 29, 2020, press report, however, states that satellite images of the first Type 003 carrier under construction suggest that this estimate may be a bit low, and that the Type 003 carriers will be closer in displacement to U.S. Navy aircraft carriers, which have a displacement of about 100,000 tons.[40] The Type 003 carriers are expected to be equipped with electromagnetic catapults rather than a ski ramp, which will improve the range/payload capability of the fixed-wing aircraft that they operate.

Figure 11. Type 003 Aircraft Carrier Under Construction

Source: Photograph accompanying China Power Team, "Tracking China's Third Aircraft Carrier," China Power, Center for Strategic and International Studies (CSIS), May 6, 2019 (updated September 17, 2020), accessed October 28, 2020, at https://chinapower.csis.org/china-carrier-type-002/.

The start of construction of the first Type 003 carrier was announced in the Chinese press in November 2018.[41] A July 18, 2020, press report states

[39] See, for example, Liu Xuanzun, "China's Second Aircraft Carrier Can Carry 50% More Fighter Jets Than Its First," *Global Times*, August 13, 2019; Liu Zhen, "China's New Aircraft Carrier to Pack More Jet Power Than the Liaoning," *South China Morning Post*, August 15, 2019.

[40] Jamie Siedel, "China's First Fully Combat-Capable Aircraft Carrier Reveals Xi's Master Plan," *news.com.au*, November 29, 2020.

[41] See, for example, Zhao Lei, "China Launches Work on Third Aircraft Carrier, Xinhia Says," *China Daily*, November

> China is expected to launch[42] its next-generation aircraft carrier within a year and construction on a sister ship for the new giant vessel has been hastened, two sources close to the projects said.
>
> The Type 002 [now called Type 003] aircraft carrier—the country's third carrier and the second to be domestically developed—has started the final assembly process, two independent sources told the South China Morning Post.
>
> "Assembly of the new aircraft carrier has begun and is expected to be completed in the first half of next year, because the Covid-19 pandemic slowed down progress," said the first source, who requested anonymity because of the sensitivity of the issue.
>
> "Workers are also starting the keel-laying for the new carrier's sister ship. Both ships have been built by the Jiangnan Shipyard outside Shanghai."[43]

Type 004 Carrier

A March 15, 2018, press report stated that following the Type 003 carrier design, China was to begin building a Type 004 carrier design that would displace 90,000 to 100,000 tons and, in addition to being equipped with electromagnetic catapults, be nuclear powered.[44] As mentioned above, in late November 2019, it was reported that the Chinese government had put on hold plans to build this Type 004 design.

Possible Type 076 Catapult-Equipped Amphibious Assault Ship

See also the discussion of the possible catapult-equipped Type 076 amphibious assault ship (**Figure 22** and **Figure 23**) in the section on China's amphibious ships.

Commercial Heavy-Lift Ship Reportedly Used in Exercise as Helicopter Carrier

In August 2020, it was reported that China had used a commercial heavy-lift ship in a military exercise as a platform for operating at least two PLA Army helicopters.[45]

Carrier-Based Aircraft

China's primary carrier-based fighter aircraft is the J-15 or Flying Shark (**Figure 12**), an aircraft derived from the Russian Su-33 Flanker aircraft design that can operate from carriers equipped with a ski ramp rather than catapults. China reportedly plans to develop a carrier-capable variant

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26, 2018; Liu Xuanzun (Global Times), "China's 3rd Aircraft Carrier Under Construction, to Be Equipped with New Technologies, *People's Daily Online*, November 27, 2018.

[42] The term *launch* means that the ship is put into the water for the final stages of its construction.

[43] Minnie Chan, "China Steps Up Shipbuilding with Two More Aircraft Carriers Under Construction Towards 2035 Navy Goal," *South China Morning Post*, July 18, 2020. See also China Power Team, "Tracking China's Third Aircraft Carrier, China Power, Center for Strategic and International Studies (CSIS), May 6, 2019 (updated September 17, 2020), accessed October 28, 2020, at https://chinapower.csis.org/china-carrier-type-002/; Gerry Shih, "China's Third Aircraft Carrier Takes Shape, with Ambitions to Challenge U.S. Naval Dominance," *Washington Post*, October 16, 2020; Liu Xuanzun, "China's 3rd Aircraft Carrier 'Progressing Smoothly," *Global Times*, September 13, 2020.

[44] Jeffrey Lin and P.W. Singer, "A Chinese Shipbuilder Accidentally Revealed Its Major Navy Plans," *Popular Science*, March 15, 2018.

[45] David Axe, "Surprise! The Chinese Navy Just Transformed This Cargo Ship Into An Instant Helicopter Carrier," *Forbes*, August 22, 2020; Dave Makichuk, "PLA Army Tests Commercial Ships as Wartime Flight Decks," *Asia Times*, August 25, 2020; John Dotson, "Semi-Submersible Heavy Lift Vessels: A New "Maritime Relay Platform" for PLA Cross-Strait Operations?" Jamestown Foundation, August 31, 2020.

of its J-20 fifth-generation stealth fighter and/or a carrier-capable variant of its FC-31 fifth-generation stealth fighter to complement or succeed the J-15 on catapult-equipped Chinese carriers.[46] China reportedly is also developing a carrier-based airborne early warning (AEW) aircraft, called the KJ-600, that is similar to the U.S. Navy's carrier-based E-2 Hawkeye AEW aircraft,[47] and stealth drone aircraft.[48]

Figure 12. J-15 Flying Shark Carrier-Capable Fighter

Source: Photograph accompanying "China Developing Elite New Variants of the J-15 Flying Shark to Deploy from EMALS Equipped Future Carriers; Implications for the Balance of Power at Sea," *Military Watch Magazine*, August 17, 2018, accessed August 28, 2019.

Roles and Missions

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

[46] See Ricf Joe, "The FC-31, China's 'Other' Stealth Fighter, A Look at the Jet with Many Names—and Its Carrier-Based Future," *Diplomat*, February 18, 2021; Kris Osborn, "Is China Building Its Own F-35 Fighter Jets for its Aircraft Carriers?" *National Interest*, July 3, 2020; Caleb Larson, "FC-31: China's Next Carrier Jet is Stolen and Stealthy," *National Interest*, April 18, 2020; Sebastien Roblin, "China's New Aircraft Carriers Are Getting Stealth Fighters," *National Interest*, October 26, 2019; Rick Joe, "Beyond China's J-20 Stealth Fighter," *Diplomat*, September 20, 2019; Minnie Chan, "China's Navy 'Set to Pick J-20 Stealth Jets for Its Next Generation Carriers,'" *South China Morning Post*, August 27, 2019. See also Thomas Newdick, "New Images Of China's Elusive Catapult-Capable J-15T Carrier Fighter Emerge," *The Drive*, November 18, 2020.

[47] See, for example, Liu Xuanzun, "China's First Carrier-Based Early Warning Plane Continues Flight Tests: Report," *Global Times*, February 22, 2021; H. I. Sutton, "First Image Of China's New Carrier-Based AEW Plane," *Forbes*, August 29, 2020; Liu Xuanzun, "China's First Carrier-Based, Fixed-Wing Early Warning Aircraft Makes Maiden Flight: Reports," *Global Times*, September 1, 2020; Peter Suciu, "The Xian KJ-600 Could Make China's Aircraft Carriers Far More Powerful," *National Interest*, September 5, 2020; Kris Osborn, "KJ-600: China's New Surveillance Plane Will Make Their Aircraft Carriers Even More Deadly," *National Interest*, September 8, 2020.

[48] Minnie Chan, "China to Deploy Sharp Sword Stealth Drone for New Type 001A Aircraft Carrier," *South China Morning Post*, September 17, 2019.

range of land-based Chinese aircraft. Consequently, most observers believe that China is acquiring carriers primarily for their value in other kinds of operations, and to demonstrate China's status as a leading regional power and major world power. Chinese aircraft carriers could be used for power-projection operations, particularly in scenarios that do not involve opposing U.S. forces, and to impress or intimidate foreign observers.[49]

Chinese aircraft carriers could also be used for humanitarian assistance and disaster relief (HA/DR) operations, maritime security operations (such as antipiracy operations), and noncombatant 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

Overview

China since the early 1990s has put into service numerous new classes of indigenously built surface combatants, including a new cruiser (or large destroyer), several classes of destroyers and frigates, a new class of corvettes (i.e., light frigates), and a new class of missile-armed patrol craft.

These new classes of surface combatants demonstrate a significant modernization of PLA Navy surface combatant technology. DOD states that China's navy "remains engaged in a robust shipbuilding program for surface combatants, producing new guided-missile cruisers (CGs), guided-missile destroyers (DDGs) and corvettes (FFLs). These assets will significantly upgrade the air defense, anti-ship, and anti-submarine capabilities of China's navy and will be critical as China's navy expands its operations beyond the range of the PLA's shore-based air defense systems."[50] DIA states that "the era of past designs has given way to production of modern multimission destroyer, frigate, and corvette classes as China's technological advancement in naval design has begun to approach a level commensurate with, and in some cases exceeding, that of other modern navies."[51] China is also upgrading its older surface combatants with new weapons and other equipment.[52]

Type 055 Cruiser/Large Destroyer

China is building a new class of cruiser (or large destroyer), called the Renhai-class or Type 055 (**Figure 13** and **Figure 14**), that reportedly displaces between 10,000 and 13,000 tons.[53] A March

[49] For a discussion, see, for example, Bryan McGrath and Seth Cropsey, "The Real Reason China Wants Aircraft Carriers, China's Carrier Plans Target U.S. Alliances, Not Its Navy," *Real Clear Defense* (*www.realcleardefense.com*), April 10, 2014; Sebastien Roblin, "All of the Reasons Why the World Should Fear China's Aircraft Carriers," *National Interest*, October 24, 2017.

[50] *2020 DOD CMSD*, pp. 45-46.

[51] *2019 DIA CMP*, p. 70.

[52] See, for example, H. I. Sutton, "China Increases Potency Of Anti-Carrier Capabilities," *Forbes*, May 1, 2020; Peter Suciu, "Chinese Warships Are Now Armed with Supersonic Anti-Ship Missiles," *National Interest*, May 10, 2020.

[53] For a discussion of the Type 055 design, see Sidharth Kaushal, "The Type 055: A Glimpse into the PLAN's Developmental Trajectory," Royal United Services Institute (RUSI), October 19, 2020.

7, 2021, press report by a Chinese media outlet states that the ship displaces more than 12,000 tons.[54] By way of comparison, the U.S. Navy's Ticonderoga (CG-47) class cruisers and Arleigh Burke (DDG-51) class destroyers (aka the U.S. Navy's Aegis cruisers and destroyers) displace about 10,100 tons and 9,300 tons, respectively, while the U.S. Navy's three Zumwalt (DDG-1000) class destroyers displace about 15,600 tons.

Figure 13. *Renhai* (Type 055) Cruiser (or Large Destroyer)

Source: Cropped version of photograph accompanying Kyle Mizokami, "Can the U.S. Navy Beat China's New Type 055 Destroyer In a Fight?" *National Interest*, September 29, 2019.

ONI states that Type 055 ships are being built by two shipyards, and that multiple ships in the class are currently under construction.[55] The first Type 055 ship was reportedly commissioned into service on January 12, 2020, about two and a half years after it was launched (i.e., put into the water for the final stages of its construction). A March 7, 2021, press report from a Chinese media outlet stated that the second ship in the class had recently been commissioned into service.[56] The sixth ship in the class was reportedly launched in December 2019.[57] In August 2020, it was reported that the seventh ship in the class was delivered to the navy in May 2020,[58]

[54] Liu Xuanzun, "China's 2nd Type 055 Large Destroyer Enters Naval Service," *Global Times*, March 7, 2021.

[55] Source: Unclassified ONI information paper prepared for Senate Armed Services Committee, subject "UPDATED China: Naval Construction Trends vis-à-vis U.S. Navy Shipbuilding Plans, 2020-2030," February 2020, p. 4. Provided by Senate Armed Services Committee to CRS and CBO on March 4, 2020, and used in this CRS report with the committee's permission.

[56] Liu Xuanzun, "China's 2nd Type 055 Large Destroyer Enters Naval Service," *Global Times*, March 7, 2021. See also Xavier Vavasseur "China's 2nd Type 055 Destroyer 'Lhasa' 拉萨 Commissioned With PLAN," *Naval News*, March 7, 2021.

[57] Kristin Huang, "China Steps Up Warship Building Programme as Navy Looks to Extend Its Global Reach," *South China Morning Post*, December 31, 2019. See also Liu Xuanzun, "Chinese Navy Commissions First Type 055 Destroyer," *Global Times*, January 12, 2020. Another press report states that eight Type 055 ships are expected to enter service over the next four years, and that more than two dozen such ships might be in service by the late 2020s. (Franz-Stefan Gady, "China's Navy Commissions First-of-Class Type 055 Guided Missile Destroyer," *Diplomat*, January 13, 2020.)

[58] Minnie Chan, "Chinese Navy May Launch Eighth Type 055 Stealth Destroyer Later This Year," *South China Morning Post*, August 20, 2020.

that the eighth ship in the class was launched on August 30, 2020,[59] and that the eighth ship "will complete the first group of Type 055 destroyers."[60]

Figure 14. *Renhai* (Type 055) Cruiser (or Large Destroyer)

Source: Photograph accompanying Peter Suciu, "Chinese Navy to Launch 8th New Type 055 'Stealth' Destroyer," *National Interest*, August 22, 2020. The article credits the photograph to "Chinese Internet."

Type 052 Destroyer

China since the early 1990s has put into service multiple new classes of indigenously built destroyers, the most recent of which is the Luyang III (Type 052D) class (**Figure 15**), which displaces about 7,500 tons and is equipped with phased-array radars and vertical launch missile systems that outwardly are broadly similar to those on U.S. Navy cruisers and destroyers. Type 052D ships have been in serial production for some time, and the 25th such ship was reportedly launched on August 30, 2020.[61] One observer states that "at present the PLAN fields 20 aegis-type [i.e., Type 052] destroyers in service; however in four to five years it is likely that the PLAN will field 39 aegis-type destroyers in service (or 40, depending on whether a 26th 052D is built or not)."[62] Press reports in March 2021 stated that China is now commissioning an upgraded version

[59] Liu Xuanzun, "PLA Launches New Type 055, Type 052D Destroyers After Decommissioning All Type 051 Destroyers: Reports," *Global Times*, August 30, 2020.

[60] Minnie Chan, "Chinese Navy May Launch Eighth Type 055 Stealth Destroyer Later This Year," *South China Morning Post*, August 20, 2020. See also Peter Suciu, "Chinese Navy to Launch 8th New Type 055 'Stealth' Destroyer," *National Interest*, August 22, 2020. A November 18, 2020, press report that cited a November 16, 2020, Chinese-language press report stated that "China's Type 055 destroyer is equipped with a microwave anti-missile system which can disable the electronic equipment of incoming enemy aircraft and missiles, and even burn the enemy's pilots." ("China Uses Microwave Weapons against India," *Chinascope*, November 18, 2020, which cited the following as its source: "Lianhe Zaobao, November 16, 2020, https://www.zaobao.com.sg/realtime/china/story20201116-1101404.")

[61] Liu Xuanzun, "PLA Launches New Type 055, Type 052D Destroyers After Decommissioning All Type 051 Destroyers: Reports," *Global Times*, August 30, 2020.

[62] Rick Joe, "The Chinese Navy's Destroyer Fleet Will Double by 2025. Then What?" *Diplomat*, July 12, 2020. See

of the Type 052D, informally called the Type 052DL, that incorporates an extended-length helicopter flight deck and a new radar.[63]

Figure 15. *Luyang III* (Type 052D) Destroyer

Source: Cropped version of photograph accompanying "Type 052D Luyang-III Class," SinoDefence.com, September 3, 2017, accessed August 28, 2019.

Type 054 Frigate

China since the early 1990s has also put into service multiple new classes of indigenously built frigates, the most recent of which is the Jiangkai II (Type 054A) class (**Figure 16**), which displaces about 4,000 tons. ONI states that 30 Type 054As entered service between 2008 and 2019, and that no additional Type 054As are currently under construction.[64]

also Kris Osborn, "Double the Destroyers: China Will Soon Have Almost 40 of These Modern Warships," *National Interest*, July 17, 2020.

[63] "Chinese Navy Commissions Upgraded Variation of the Type 052D Destroyer," *Navy Recognition*, March 3, 2021.

[64] Source: Unclassified ONI information paper prepared for Senate Armed Services Committee, subject "UPDATED China: Naval Construction Trends vis-à-vis U.S. Navy Shipbuilding Plans, 2020-2030," February 2020, p. 4. Provided by Senate Armed Services Committee to CRS and CBO on March 4, 2020, and used in this CRS report with the committee's permission. For a press article discussing the potential features of China's next frigate design beyond the Type 054A, see Rick Joe, "What Will the Chinese Navy's Next Frigate Look Like?" *Diplomat*, May 15, 2020.

Figure 16. *Jiangkai II* (Type 054A) Frigate

Source: Cropped version of photograph from Chinese Military Review, "Type 054A (Jiangkai II class) FFG-546 Yancheng Guided Missile Frigate in Mediterranean," undated (but with a URL suggesting that it was posted in February of 2014), accessed August 29, 2018.

Type 056 Corvette

China has also built—in large numbers over a relatively short time period—a new type of corvette (i.e., a light frigate, or FFL) called the Jiangdao class or Type 056 (**Figure 17**), which reportedly displaces 1,300 tons to 1,500 tons. Type 056 ships were built at a high annual rate in four shipyards—the first was commissioned in 2013, and the 72nd and final ship of the type was reportedly commissioned in early 2021, implying an average commisisoning rate of about eight ships per year. DOD states that "by the end of 2019, more than 42 Jiangdao class FFLs had entered service out of an expected production run of at least 70 ships."[65] ONI states that as of February 2020, more than 50 had entered service and another 15 were under construction.[66] In February 2021, a Chinese media outlet reported that the final two Type 056 ships—the 71st and 72nd such ships—had been commissioned into service in January and February 2021, and that the completion of Type 056 production could permit a shift to production of greater numbers of larger warships.[67] As shown in **Table 1**, the rapid growth in the number of Type 056 corvettes since

[65] *2020 DOD CMSD*, p. 46.

[66] Source: Unclassified ONI information paper prepared for Senate Armed Services Committee, subject "UPDATED China: Naval Construction Trends vis-à-vis U.S. Navy Shipbuilding Plans, 2020-2030," February 2020, p. 4. Provided by Senate Armed Services Committee to CRS and CBO on March 4, 2020, and used in this CRS report with the committee's permission.

[67] Liu Xuanzun, "PLA Navy Commissions Final Type 056A Corvettes Specialized in Coastal Defense," *Global Times*, February 17, 2021. See also "Chinese Navy PLAN Commissions Final Type 056A Corvettes," *Navy Recognition*, February 18, 2021.

2013 accounts for a substantial share of the net increase in the total number of ships in China's navy since 2013.

Figure 17. *Jingdao* (Type 056) Corvette

Source: Cropped version of image included at Chinese Military Review, "Random Images of Chinese Type 056 Jiangdao Class Light Corvette," undated (but with a URL suggesting that it was posted in October 2013), accessed August 29, 2018.

Amphibious Ships

Type 071 Amphibious Ship

China's new *Yuzhao* or Type 071 amphibious ships (**Figure 18**) have an estimated displacement of more than 19,855 tons,[68] compared to about 25,900 tons for the U.S. Navy's new San Antonio (LPD-17) class amphibious ships. The fifth Type 071 ship was reportedly commissioned into service in September 2018, and at least two more reportedly are under construction.

[68] Unless otherwise indicated, displacement figures cited in this report are full load displacements. *IHS Jane's Fighting Ships 2017-2018*, p. 156, does not provide a full load displacement for the Type 071 class design. Instead, it provides a standard displacement of 19,855 tons. Full load displacement is larger than standard displacement, so the full load displacement of the Type 071 design is more than 19,855 tons.

Figure 18. *Yuzhao* (Type 071) Amphibious Ship

Source: Cropped version of photograph from Chinese Military Review, "Jinggang Shan (999) Type 071 YUZHAO Class Amphibious Transport Dock," undated (but with a URL suggesting that it was posted in February 2012), accessed August 29, 2018.

Type 075 Amphibious Assault Ship

On September 25, 2019, China launched (i.e., put into the water for the final stages of its construction) the first of a new type of amphibious assault ship[69] called the *Yushen* or Type 075 (**Figure 19**, **Figure 20**, and **Figure 21**) that has an estimated displacement of 30,000 to 40,000 tons, compared to 41,000 to 45,000 tons for U.S. Navy LHA/LHD-type amphibious assault ships.[70] On April 11, 2020, it was reported that a fire had occurred on the ship;[71] published photographs showed smoke rising from the ship and subsequent smoke stains at the ship's stern). On August 5, it was reported that the ship had begun its first sea trial,[72] suggesting that some or all of the damage caused by the fire had been repaired.

[69] Amphibious assault ships, also referred to as helicopter carriers or (in British parlance) commando carriers, look like medium-sized aircraft carriers. U.S. Navy amphibious assault ships are designated LHA or LHD.

[70] See, for example, Rick Joe, "The Future of China's Amphibious Assault Fleet," *Diplomat*, July 17, 2019; Sebastien Roblin, "Bad News: China is Building Three Huge Helicopter 'Aircraft Carriers,'" *National Interest*, July 27, 2019; Tyler Rogoway, "China's New Amphibious Assault Ship Is A Monster," *The Drive*, August 22, 2019; Mike Yeo, "Photos Reveal Progress on China's Largest Amphibious Assault Ship," Defense News, August 23, 2019.

[71] See, for example, "China Confirms Fire on Board Type 075 Amphibious Assault Ship," *DefenseWorld.net*, April 11, 2020; Xavier Vavasseur, "China's 1st Type 075 LHD Caught On Fire During Fitting Out," *Naval News*, April 12, 2020; "Fire Breaks Out on China's New Amphibious Assault Helicopter Carrier," *War Is Boring*, April 13, 2020.

[72] Mallory Shelbourne, "China's New Type-075 Amphibious Warship Kicks Off Sea Trials," USNI News, August 5 (updated August 13), 2020; Xavier Vavasseur "China's First Type 075 Landing Helicopter Dock Started Sea Trials," *Naval News*, August 5, 2020. See also Liu Zhen, "Chinese Military's First Type 075 Amphibious Assault Ship Begins Sea Trial," *South China Morning Post*, August 7, 2020; Liu Xuanzun, "PLA 1st Amphibious Assault Ship Appears on Maiden Voyage, Photos Show," *Global Times*, August 5, 2020.

China reportedly launched the second Type 075 ship, on April 22, 2020,[73] and the third on January 29, 2021.[74]

Figure 19. Type 075 Amphibious Assault Ship

Source: Photograph accompanying David Axe, "China Is Finishing Its First Large Helicopter Assault Ship," *National Interest*, October 29, 2019.

[73] Liu Zhen, "China Launches Second Type 075 Amphibious Helicopter Assault Ship," *South China Morning Post*, April 23, 2020; Elizabeth Shim, "China Launches Second Type 075 Assault Ship," *UPI*, April 22, 2020; Caleb Larson, "China Just Launched Their Second Type 075 Assault Carrier—Here's Why Everyone Is Worried," *National Interest*, April 22, 2020; Andrew Tate, "China's Second Type 075 Amphibious Assault Ship Launched in Shanghai," *Jane's*, April 22, 2020.

[74] Global Times, "China Launches Two New Warships, One for Pakistan," *Global Times*, January 29, 2021.

Figure 20. Type 075 Amphibious Assault Ship

Source: Photograph accompanying Liu Zhen, "Chinese Military's First Type 075 Amphibious Assault Ship Begins Sea Trial," *South China Morning Post*, August 7, 2020. The article credits the photograph to Weibo.

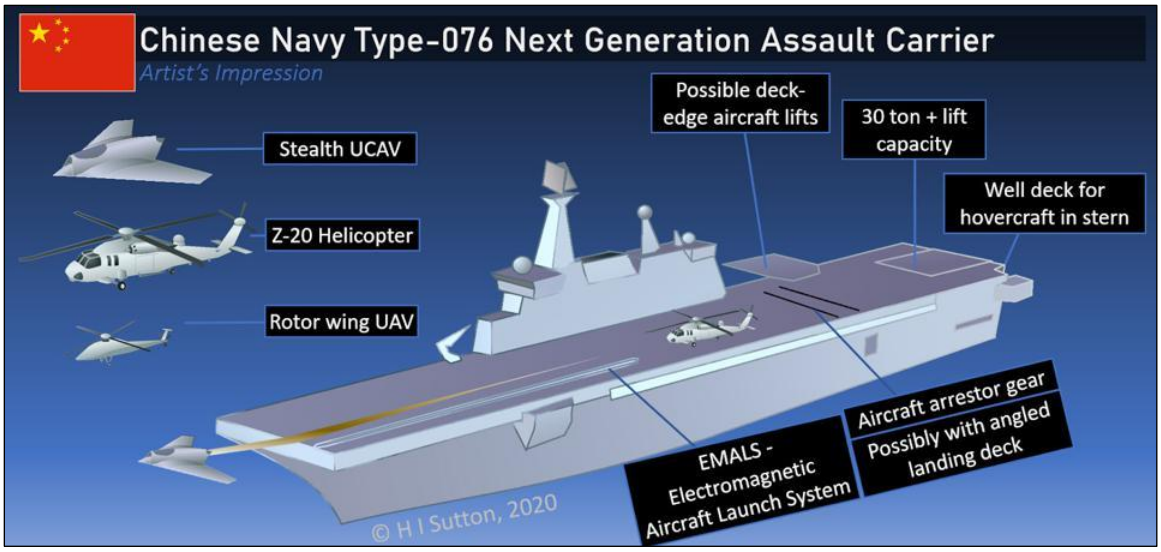
Figure 21. Type 075 Amphibious Assault Ship

Source: Photograph accompanying Joseph Trevithick and Tyler Rogoway, "China Just Launched Its Huge And Incredibly Quickly Built Amphibious Assault Ship," *The Drive*, September 25, 2019. The caption to the photograph credits the photograph to "Chinese internet."

Possible Type 076 Catapult-Equipped Amphibious Assault Ship

In July 2020, it was reported that China might be planning to build the first of a new class of amphibious assault ships, called the Type 076 by observers (**Figure 22** and **Figure 23**), that would be equipped with electromagnetic catapults, which would enhance its ability to support operations by fixed-wing aircraft and make it somewhat more like an aircraft carrier.[75]

Figure 22. Notional Rendering of Possible Type 076 Amphibious Assault Ship



Source: Illustration accompanying H. I. Sutton, "Stealth UAVs Could Give China's Type-076 Assault Carrier More Firepower," *Forbes*, July 23, 2020.

Figure 23. Notional Rendering of Possible Type 076 Amphibious Assault Ship

Source: Illustration accompanying Minnie Chan, "Chinese Shipbuilder Planning Advanced Amphibious Assault Ship," *South China Morning Post*, July 27 (updated July 28), 2020.

[75] H. I. Sutton, "Stealth UAVs Could Give China's Type-076 Assault Carrier More Firepower," *Forbes*, July 23, 2020; Kathrin Hille, "China Plans Hybrid Assault Vessel to Strengthen Overseas Power," *Financial Times*, July 24, 2020; Minnie Chan, "Chinese Shipbuilder Planning Advanced Amphibious Assault Ship," *South China Morning Post*, July 27 (updated July 28), 2020; Rick Joe, "Whispers of 076, China's Drone Carrying Assault Carrier," *Diplomat*, August 21, 2020.

Amphibious Ship Roles and Missions

Although larger amphibious ships such as the Type 071 and Type 075 would be of value for conducting amphibious landings in Taiwan-related conflict scenarios, some observers believe that China is building such ships as much for their value in conducting other operations, such as operations for asserting and defending China's claims in the South and East China Seas, humanitarian assistance/disaster relief (HA/DR) operations, maritime security operations (such as antipiracy operations), and noncombatant evacuation operations (NEOs). Politically, amphibious ships can also be used for naval diplomacy (i.e., port calls and engagement activities) and for impressing or intimidating foreign observers.[76]

Operations Away from Home Waters

Although China's navy operates primarily in China's home waters, Chinese navy ships are conducting increasing numbers of operations away from China's home waters, including the broader waters of the Western Pacific, the Indian Ocean, and the waters surrounding Europe, including the Mediterranean Sea and the Baltic Sea. A November 23, 2019, DOD news report quoted Admiral Philip Davidson, the commander of the U.S. Indo-Pacific Command, as stating that China's navy had conducted more global naval deployments in the past 30 months than it had in the previous 30 years.[77]

While many of China's long-distance naval deployments have been for making diplomatic port calls, some of them have been for other purposes, including conducting training exercises and carrying out antipiracy operations in waters off Somalia. China has been conducting antipiracy operations in waters off Somalia since December 2008 via a succession of more than 30 rotationally deployed naval escort task forces. China's distant naval operations are supported in part by China's military base in Djibouti, which China officially opened in August 2017 as its first overseas military base.[78]

Numbers of Ships; Comparisons to U.S. Navy

Ultimate Size and Composition of China's Navy Not Publicly Known

The planned ultimate size and composition of China's navy is not publicly known. The U.S. Navy makes public its force-level goal and regularly releases a 30-year shipbuilding plan that shows planned procurements of new ships, planned retirements of existing ships, and resulting projected force levels, as well as a five-year shipbuilding plan that shows, in greater detail, the first five years of the 30-year shipbuilding plan.[79] In contrast, China does not release a navy force-level

[76] See, for example, Grant Newsham, "China's Amphibious Force Emerges," *Asia Times*, November 5, 2019.

[77] David Vergun, "Freedom of Navigation in South China Sea Critical to Prosperity, Says Indo-Pacific Commander," *DOD News*, November 23, 2019.

[78] For a brief discussion of Djibouti and other potential Chinese military bases outside China, see *2020 DOD CMSD*, pp. x, 48, 80, and 128-130. For a recent press report about China's military base in Djibouti, see H. I. Sutton, "Satellite Images Show That Chinese Navy Is Expanding Overseas Base," *Forbes*, May 10, 2020; Peter Suciu, "China's Naval Base in Africa Is Getting Bigger. Is a Network of Bases Next?" *National Interest*, May 11, 2020; Staff writer, "Chinese Navy Expanding Base in Africa, Satellite Images Confirm," *War Is Boring*, May 11, 2020; Jean-Pierre Cabestan, "China's Djibouti Naval Base Increasing Its Power," *East Asia Forum*, May 16, 2020; Dave Makichuk, "China Builds a Mega-Fortress on the Horn of Africa," *Asia Times*, May 18, 2020; Michael Evans, "Beijing's African Port Ready for Aircraft Carriers," *Times (UK)*, May 19, 2020.

[79] For more information on the U.S. Navy's force-level goal, 30-year shipbuilding plan, and five-year shipbuilding

goal or detailed information about planned ship procurement rates, planned total ship procurement quantities, planned ship retirements, and resulting projected force levels. It is possible that the ultimate size and composition of China's navy is an unsettled and evolving issue even among Chinese military and political leaders. One observer states that "it seems the majority of past foreign projections of Chinese military and Chinese navy procurement scale and speed have been underestimates…. All military forces have a desired force requirement and a desired 'critical mass' to aspire toward. Whether the Chinese navy is close to its desired force or not, is of no small consequence."[80]

Number of Ships Is a One-Dimensional Measure, but Trends in Numbers Can Be of Value Analytically

Relative U.S. and Chinese naval capabilities are sometimes assessed by showing comparative numbers of U.S. and Chinese ships. Although the total number of ships in a navy (or a navy's aggregate tonnage) is relatively easy to calculate, it is a one-dimensional measure that leaves out numerous other factors that bear on a navy's capabilities and how those capabilities compare to its assigned missions. As a result, as discussed in further detail in **Appendix A**, comparisons of the total numbers of ships in China's navy and the U.S. Navy are highly problematic as a means of assessing relative U.S. and Chinese naval capabilities and how those capabilities compare to the missions assigned to those navies. At the same time, however, an examination of *the trends over time in these relative numbers of ships* can shed some light on how the relative balance of U.S. and Chinese naval capabilities might be changing over time.

Three Tables Showing Numbers of Chinese and U.S. Navy Ships

Table Showing Figures from Annual DOD Reports

Table 1 shows numbers of certain types of Chinese navy ships from 2005 to the present (and the number of China coast guard ships from 2017 to the present) as presented in DOD's annual reports on military and security developments involving China. DOD states that China "has the largest navy in the world, with an overall battle force of approximately 350 ships and submarines including over 130 major surface combatants. In comparison, the U.S. Navy's battle force is approximately 293 ships as of early 2020."[81] DIA states that "although the overall inventory has remained relatively constant, the PLAN is rapidly retiring older, single-mission warships in favor of larger, multimission ships equipped with advanced antiship, antiair, and antisubmarine weapons and sensors and C2 [command and control] facilities."[82]

As can be seen in **Table 1**, about 72% of the increase since 2005 in the number of Chinese navy ships shown in the table (a net increase of 84 ships out of a total net increase of 117 ships) resulted from increases in missile-armed fast patrol craft starting in 2009 (a net increase of 35 ships) and corvettes starting in 2014 (49 ships). These are the smallest surface combatants shown in the table. The net 35-ship increase in missile-armed fast patrol craft was due to the construction

plan, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

[80] Rick Joe, "Hints of Chinese Naval Procurement Plans in the 2020s," *Diplomat*, December 25, 2020.

[81] *2020 DOD CMSD*, p. ii. See also p. 44, and *2019 DIA CMP*, p. 63.

[82] *2019 DIA CMP*, p. 69.

between 2004 and 2009 of 60 new *Houbei* (Type 022) fast attack craft[83] and the retirement of 25 older fast attack craft that were replaced by Type 022 craft. The 49-ship increase in corvettes is due to the *Jingdao* (Type 056) corvette program discussed earlier. ONI states that "a significant portion of China's Battle Force consists of the large number of new corvettes and guided-missile frigates recently built for the PLAN."[84]

As can also be seen in the table, most of the remaining increase since 2005 in the number of Chinese navy ships shown in the table is accounted for by increases in cruisers and destroyers (12 ships), frigates (6 ships), and amphibious ships (15 ships). Most of the increase in frigates occurred in the earlier years of the table; the number of frigates has changed little in the later years of the table.

Table 1 lumps together less-capable older Chinese ships with more-capable modern Chinese ships. Thus, in examining the numbers in the table, it can be helpful to keep in mind that for many of the types of Chinese ships shown in the table, the percentage of the ships accounted for by more-capable modern designs was growing over time, even if the total number of ships for those types was changing little.

For reference, **Table 1** also shows the total number of ships in the U.S. Navy (known technically as the total number of battle force ships), and compares it to the total number of the types of Chinese ships that are shown in the table. The result is an apples-vs.-oranges comparison, because the Chinese figures exclude certain ship types, such as auxiliary and support ships, while the U.S. Navy figure includes auxiliary and support ships but excludes patrol craft. Changes over time in this apples-vs.-oranges comparison, however, can be of value in understanding trends in the comparative sizes of the U.S. and Chinese navies.

On the basis of the figures in **Table 1**, it might be said that the total number of Chinese navy ships of the types shown in the table (which might be thought of as the principal combat ships of China's navy) surpassed the total number of U.S. Navy battle force ships (a figure that includes both combat ships and auxiliary ships) in 2015. It is important, however, to keep in mind the differences in composition between the two navies. The U.S. Navy, for example, has many more aircraft carriers, nuclear-powered submarines, and cruisers and destroyers, while China's navy has many more diesel attack submarines, frigates, and corvettes.

[83] The Type 022 program was discussed in the August 1, 2018, version of this CRS report, and earlier versions.

[84] Source: Unclassified ONI information paper prepared for Senate Armed Services Committee, subject "UPDATED China: Naval Construction Trends vis-à-vis U.S. Navy Shipbuilding Plans, 2020-2030," February 2020, p. 4. Provided by Senate Armed Services Committee to CRS and CBO on March 4, 2020, and used in this CRS report with the committee's permission.

Table 1. Numbers of Certain Types of Chinese and U.S. Ships Since 2005

(Figures for Chinese ships taken from annual DOD reports on military and security developments involving China)

Year of DOD report	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2020 change from 2005**
Ballistic missile submarines	1	1	1	1	2	2	2	2	3	3	4	4	4	4	4	4	+3
Nuclear-powered attack submarines	6	5	5	5	6	6	5	5	5	5	5	5	5	5	6	6	0
Diesel attack submarines	51	50	53	54	54	54	49	48	49	51	53	57	54	47	50	46	-5
Aircraft carriers	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	2	+2
Cruisers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	+1
Destroyers	21	25	25	29	27	25	26	26	23	24	21	23	31	28	33	32	+11
Frigates	43	45	47	45	48	49	53	53	52	49	52	52	56	51	54	49	+6
Corvettes	0	0	0	0	0	0	0	0	0	8	15	23	23	28	42	49	+49
Missile-armed coastal patrol craft	51	45	41	45	70	85	86	86	85	85	86	86	88	86	86	86	+35
Amphibious ships: LSTs and LPDs	20	25	25	26	27	27	27	28	29	29	29	30	34	33	37	37	+17
Amphibious ships: LSMs	23	25	25	28	28	28	28	23	26	28	28	22	21	23	22	21	-2
Total of types above (*does not include other types, such as auxiliary and support ships*)	**216**	**221**	**222**	**233**	**262**	**276**	**276**	**271**	**273**	**283**	**294**	**303**	**317**	**306**	**335**	**333**	**+117**
China Coast Guard ships	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*185*	*240*	*248*	*255*	*n/a*
Total U.S. Navy battle force ships (which includes auxiliary and support ships but excludes patrol craft)	291	282	281	279	282	285	288	284	287	285	289	271	275	279	286	296	+5
Total U.S. Navy battle force ships compared to above total for certain Chinese ship types	+75	+61	+59	+46	+20	+9	+12	+13	+14	+2	-5	-32	-42	-27	-49	-37	-112

Source: Table prepared by CRS based on 2005-2019 editions of annual DOD report to Congress on military and security developments involving China (known for 2009 and prior editions as the report on China military power), and (for U.S. Navy ships) U.S. Navy data as presented in CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

Notes: n/a means data not available in report. **LST** means tank landing ship; **LPD** means transport dock ship; **LSM** means medium landing ship. The DOD report generally covers events of the prior calendar year. Thus, the 2019 edition covers events during 2018, and so on for earlier years. Similarly, for the U.S. Navy figures, the 2019 column shows the figure for the end of FY2018, and so on for earlier years.

Table Showing ONI Figures from February 2020

Table 2 shows comparative numbers of Chinese and U.S. battle force ships (and figures for certain types of ships that contribute toward China's total number of battle force ships) from 2000 to 2030, with the figures for 2025 and 2030 being projections. The figures for China's ships are taken from an ONI information paper of February 2020. Battle force ships are the types of ships that count toward the quoted size of the Navy. For China, the total number of battle force ships shown excludes the missile-armed coastal patrol craft shown in **Table 1**, but includes auxiliary and support ships that are not shown in **Table 1**. Compared to **Table 1**, the figures in **Table 2** come closer to providing an apples-to-apples comparison of the two navies' numbers of ships.

On the basis of the figures in **Table 2,** it might be said that China's navy surpassed the U.S. Navy in terms of total number of battle force ships sometime between 2015 and 2020. As mentioned earlier in connection with **Table 1**, however, it is important to keep in mind the differences in composition between the two navies. The U.S. Navy, for example, currently has many more aircraft carriers, nuclear-powered submarines, and cruisers and destroyers, while China's navy currently has many more diesel attack submarines, frigates, and corvettes.

Table 2. Numbers of Chinese and U.S. Navy Battle Force Ships, 2000-2030

Figures for Chinese ships taken from ONI information paper of February 2020

	2000	2005	2010	2015	2020	2025	2030
Ballistic missile submarines	1	1	3	4	4	6	8
Nuclear-powered attack submarines	5	4	5	6	7	10	13
Diesel attack submarines	56	56	48	53	55	55	55
Aircraft carriers, cruisers, destroyers	19	25	25	26	43	55	65
Frigates, corvettes	38	43	50	74	102	120	135
Total China navy battle force ships, including types not shown above	**110**	**220**	**220**	**255**	**360**	**400**	**425**
Total U.S. Navy battle force ships	***318***	***282***	***288***	***271***	***297***	***n/a***	***n/a***

Source: Table prepared by CRS. Source for China's navy: Unclassified ONI information paper prepared for Senate Armed Services Committee, subject "UPDATED China: Naval Construction Trends vis-à-vis U.S. Navy Shipbuilding Plans, 2020-2030," February 2020, 4 pp. Provided by Senate Armed Services Committee to CRS and CBO on March 4, 2020, and used in this CRS report with the committee's permission. Figures are for end of calendar year. Source for figures for U.S. Navy: U.S. Navy data; figures are for end of fiscal year.

Note: n/a means not available.

Table Showing U.S. Navy Figures from October 2020

Table 3 shows numbers of certain types of Chinese navy ships in 2020, and projections of those numbers for 2025, 2030, and 2040, along with the total number of U.S. Navy battle force ships in 2020. The figures for China's ships were provided by the Navy at the request of CRS. As with **Table 1**, the result for 2020 is an apples-vs.-oranges comparison between the Chinese navy and U.S. navy totals, because the Chinese total for 2020 excludes certain ship types, such as auxiliary and support ships, while the U.S. Navy total for 2020 includes auxiliary and support ships.

As shown in **Table 3**, the U.S. Navy projects that between 2020 and 2040, the total number of Chinese ships of the types shown in the table will increase by 94, or about 39%, with most of that increase (77 ships out of 94) coming from roughly equal increases in numbers of large surface

combatants (cruisers and destroyers—39 ships) and small surface combatants (frigates and corvettes—38 ships). Numbers of ballistic missile submarines and nuclear-powered attack submarines are each projected to more than double between 2020 and 2040, and the total number of diesel attack submarines is projected to remain almost unchanged. The number of large surface combatants is projected to almost double, and the number of small surface combatants is projected to increase by more than one-third. Numbers of larger (LHA- and LPD-type) amphibious ships are projected to increase, and the number of smaller (LST-type) amphibious ships is projected to decline, with the result that the total number of amphibious ships of all kinds is projected to decline slightly.

Table 3. Numbers of Chinese and U.S. Navy Ships, 2020-2040

Figures for Chinese ships are from U.S. navy, reflecting data as of October 2020

Ship type	2020	2025	2030	2040	2040 change from 2020
Ballistic missile submarines	4	6	8	10	+6
Nuclear-powered attack submarines	6	10	14	16	+10
Diesel attack submarines	47	47	46	46	-1
Aircraft carriers	2	3	5	6	+4
Cruisers and destroyers	41	52	60	80	+39
Frigates and corvettes	102	120	135	140	+38
LHA-type amphibious assault ships	0	4	4	6	+6
LPD-type amphibious ships	7	10	14	14	+7
LST-type amphibious tank landing ships	30	24	24	15	-15
TOTAL of types shown above	**239**	**276**	**310**	**333**	**+94**
TOTAL number of U.S. Navy battle force ships	***297***	***n/a***	***n/a***	***n/a***	***n/a***

Source: For Chinese navy ships: U.S. Navy data provided to CRS by Navy Office of Legislative Affairs, reflecting data as of October 26, 2020.

Notes: n/a means not available.

U.S. Navy Response

The U.S. Navy in recent years has taken a number of actions to counter China's naval modernization effort. Among other things, the U.S. Navy has

- shifted a greater percentage of its fleet to the Pacific;[85]
- assigned its most capable new ships and aircraft and its best personnel to the Pacific;

[85] Efforts in this regard began at least as far back as 2006: The final report on the 2006 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." (U.S. Department of Defense, *Quadrennial Defense Review Report*. Washington, 2006. February 6, 2006, p. 47.) Subsequent to this directive, the Navy announced an intention to increase to 60% (from a starting point of about 55%) the percentage of the fleet as a whole that is assigned to the Pacific.

- maintained or increased general presence operations, training and developmental exercises, and engagement and cooperation with allied and other navies in the Indo-Pacific;
- increased the planned future size of the Navy;
- initiated, increased, or accelerated numerous programs for developing new military technologies and acquiring new ships, aircraft, unmanned vehicles, and weapons;
- begun development of new operational concepts (i.e., new ways to employ Navy and Marine Corps forces) for countering Chinese maritime A2/AD forces; and
- signaled that the Navy in coming years will shift to a more distributed fleet architecture that will feature a smaller portion of larger ships, a larger portion of smaller ships, and a substantially greater use of unmanned vehicles.

U.S. Navy efforts to increase cooperation with naval forces from allies and other countries such as Japan, Australia, and India appear aimed in part at expanding existing bilateral forms of naval cooperation (e.g., U.S.-Japan, U.S.-Australia, U.S.-India) into trilateral (e.g., U.S.-Japan-Australia, U.S.-Australia-India) or quadrilateral (U.S.-Japan-Australia-India) forms that could enhance the ability of the United States and its allies in the Indo-Pacific region to balance against China's growing military capabilities and deter potential assertive actions by China.

The increase in the planned size of the Navy is detailed in detail in another CRS report.[86]

Many of the Navy's programs for acquiring highly capable ships, aircraft, and weapon systems can be viewed as intended, at least in part, at improving the U.S. Navy's ability to counter Chinese maritime A2/AD capabilities. Examples of new technologies being developed by the Navy that might be of value in countering Chinese maritime A2/AD capabilities include large unmanned vehicles,[87] lasers, the electromagnetic rail gun (EMRG), and the gun-launched guided projectile (aka hypervelocity projectile).[88]

Navy and Marine Corps efforts to develop new operational concepts such as Distributed Maritime Operations (DMO) and Expeditionary Advanced Base Operations (EABO), and to shift to a more distributed fleet architecture, are discussed in detail in other CRS reports.[89]

Issues for Congress

Overview

The overall issue for Congress is whether the U.S. Navy is responding appropriately to China's naval modernization effort. Within this overall issue, specific issues include the following:

[86] See CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke.

[87] For more on these efforts, see CRS Report R45757, *Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress*, by Ronald O'Rourke.

[88] For more on these efforts, see CRS Report R44175, *Navy Lasers, Railgun, and Gun-Launched Guided Projectile: Background and Issues for Congress*, by Ronald O'Rourke.

[89] See CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke, and CRS Report R45757, *Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress*, by Ronald O'Rourke.

- the current and potential future U.S.-China balance of naval power in general, and in specific geographic areas, particularly the South China Sea;
- whether the planned size of the Navy will be appropriate for countering China's naval modernization effort in coming years while also permitting the Navy to perform other missions, including countering Russian military forces and defending U.S. interests in the Middle East;
- whether the Navy should shift to a more-distributed fleet architecture so as to improve the Navy's ability to avoid and withstand attack from Chinese maritime A2/AD forces—and if so, what that new architecture should look like, and how quickly the Navy should shift to it;
- whether the Navy is doing enough to
  - improve its ability to counter China's ASBMs or some of China's other maritime A2/AD weapons, such as its wake-homing torpedoes;
  - develop and procure new ASCMs with ranges that match or exceed those of China's longer-ranged ASCMs;
  - increase the operating range of Navy carrier air wings, so as to improve the ability of carriers and their air wings to achieve effects while operating at longer distances from Chinese ASBMs and other A2/AD weapons; and
- whether Congress should modify acquisition policies or the metrics for judging the success of acquisition programs so as to facilitate faster development of new technologies and weapons for the Navy—and if so, how those policies or metrics should be modified.

Discussion

Regarding the U.S.-China balance of naval power in general, U.S. and other observers generally assess that while the United States today has more naval capability overall, China's naval modernization effort since the 1990s has substantially reduced the U.S. advantage, and that if current U.S. and Chinese naval capability trend lines (such as those shown in **Table 1** and **Table 2**) do not change, China might eventually draw even with or surpass the United States in overall naval capability.

Regarding the current U.S.-China naval balance of power specifically in the South China Sea, some observers are concerned that China has already drawn even with or even surpassed the United States. U.S. Navy Admiral Philip Davidson, in responses to advance policy questions from the Senate Armed Services Committee for an April 17, 2018, hearing before the committee to consider nominations, including Davidson's nomination to become Commander, U.S. Pacific Command (PACOM),[90] stated that "China is now capable of controlling the South China Sea in all scenarios short of war with the United States."[91] A January 18, 2020, press report quotes James Kraska of the Naval War College as stating that "the US has lost advantage throughout the spectrum of operations, from low-level interaction against China's maritime militia to higher-end conflict scenarios," and that "in other words, China has escalation dominance, because it has the

[90] The name of the command has since been changed to the U.S. Indo-Pacific Command (INDOPACOM).

[91] Advance Policy Questions for Admiral Philip Davidson, USN Expected Nominee for Commander, U.S. Pacific Command, p. 18. See also pp. 8. 16. 17. 19, and 43.

power to deter any US turn towards escalation. The US is outmatched in all of the scenarios."[92] A March 5, 2020, press report stated:

> China is on track to overtake the United States as the most powerful military in the Pacific within the decade -- potentially as soon as 2026 -- with the wherewithal sooner than previously expected to establish permanent, regional primacy, the top U.S. military official in the Asia-Pacific region warned March 4.
>
> Adm. Phil Davidson, head of U.S. Indo-Pacific Command, said a potential shift in the balance of military power between Beijing and Washington could come much sooner than U.S. officials have previously said.[93]

A March 6, 2021, press report stated:

> China could soon be emboldened to try to "forcely change" the existing order in the western Pacific, the head of U.S. Indo-Pacific Command said.
>
> As its rapidly advancing military approaches "overmatch" with the United States in the region, and absent a convincing deterrent, China could make a move this decade.
>
> "Make no mistake about it, China seeks a new world order—one with Chinese characteristics as they have often said where Chinese national power is more important than international law," Adm. Phil Davidson said during an American Enterprise Institute forum Thursday [March 4].…
>
> "The most important thing I'd like you all to take away from the discussions |is a fundamental understanding that the period between now and 2026—this decade—is the time horizon in which China is positioned to achieve overmatch in its capability," the Oahu-based commander said.
>
> That's when Beijing could—and he emphasized "could"—"choose to forcibly change the status quo in the region."
>
> Davidson didn't specify what action China might take, but he said with the growing military imbalance comes greater risk that China could move "before our forces might be able to deliver an effective response."
>
> Carl Schuster, a retired Navy captain, former director of operations at U.S. Pacific Command's Joint Intelligence Center and an adjunct professor at Hawaii Pacific University, said he shares Davidson's concerns.
>
> Chinese President Xi Jinping "has accelerated China's military buildup, modernization and combat readiness," Schuster said. "They outnumber us in terms of seaborne missile shooters and, of course, shore-based air power. While I don't think they will be ready to conduct an amphibious assault on Taiwan itself by 2025, I do think Xi is hoping to establish the power ratio and capability to give us pause if he decides to create an incident."…
>
> China has conducted circumnavigations of Guam and the Northern Mariana Islands with surface ships and submarines and conducted bomber runs in the Philippine Sea, creating a 360-degree threat from cruise and ballistic missiles, Davidson said….

[92] John Power, "Has the US Already Lost the Battle for the South China Sea?" *South China Morning Post*, January 18, 2020. See also Gregory B. Poling, "The Conventional Wisdom on China's Island Bases Is Dangerously Wrong," *War on the Rocks*, January 10, 2020; Kerry K. Gershaneck and James E. Fanell, "This Is How China's [Military] Will Fight And Win A War In The South China Sea," *National Interest*, January 18, 2020.

[93] Jason Sherman, "Davidson: China on Track to Unseat U.S. as Dominant Military in the Pacific As Soon As 2026," *Inside Defense*, March 5, 2021.

> Schuster said Chinese surface combatant numbers are growing at five times the rate of those of the United States.
>
> "Those ships' combat capabilities are nearly equal to ours—if not equal to ours—and they are concentrated in the western Pacific, potentially giving them 'local superiority' at a moment of their choosing," Schuster said.[94]

Skeptics of assessments like those above might argue that they do not give adequate weight to relative U.S. strengths (and corresponding Chinese relative weaknesses and limitations) in areas such as undersea warfare; personnel quality, training, and initiative; operational experience (particularly in combat situations); joint operations with other U.S. military services; and potential support from allies and partners, particularly Japan and Australia. A March 5, 2021, press report, for example, states:

> While China is expected to field 400 ships by 2025, the goal of the current US Navy shipbuilding plan, a goal with no fixed date, is for a fleet of 355 -- a substantial numerical disadvantage.
>
> That's not to say the US Navy has seen its days as the world's premier fighting force come to an end.
>
> When counting troops, the US Navy is bigger, with more than 330,000 active duty personnel to China's 250,000.
>
> Analysts point out several other factors in Washington's favor.
>
> The US Navy still fields more tonnage—bigger and heavier armed ships like guided-missile destroyers and cruisers—than China. Those ships give the US a significant edge in cruise missile launch capability.
>
> The US has more than 9,000 vertical launch missile cells on its surface ships to China's 1,000 or so, according to Nick Childs, a defense analyst at the International Institute for Strategic Studies.
>
> Meanwhile, the US attack submarine fleet of 50 boats is entirely nuclear powered, giving it significant range and endurance advantages over a Chinese fleet that has just seven nuclear-powered subs in its fleet of 62.[95]

The above-listed issues of the planned size of the Navy and the shift to a more-distributed fleet architecture are discussed in detail in other CRS reports.[96] The issue of the Navy's ability to counter China's ASBMs is discussed in detail in this report in **Appendix B**. The issue of the Navy's ability to counter wake-homing torpedoes may have been made more pressing by the reportedly poor performance of an anti-torpedo torpedo that the Navy was developing as a means for Navy surface ships to counter hard-to-decoy wake-homing torpedoes and other torpedoes. The Navy now reportedly plans to remove the anti-torpedo torpedo system from the ships that were equipped with it.[97]

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[94] William Cole, "China Could Soon Outgun US in Western Pacific, Indo-Pacific Chief Says," *Honolulu Star-Advertiser*, March 6, 2021.

[95] Brad Lendon, "China Has Built the World's Largest Navy. Now What's Beijing Going to Do with It?" *CNN*, March 5, 2021.

[96] See CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke, and CRS Report R45757, *Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress*, by Ronald O'Rourke.

[97] For additional discussion, see Alex Lockie, "US Navy Admits Failure on $760 Million Weapon to Protect Its Aircraft Carriers from An Age-Old Threat," *Business Insider*, February 5, 2019; Joseph Trevithick, "The Navy Is Ripping Out

The Navy in recent years has initiated efforts to develop and procure longer-ranged ASCMs, but some observers have expressed frustration that these efforts are not moving quickly enough.[98] In support of its efforts, the Navy testified in March 2020 that

> The Navy's offensive strike systems consist of a broad family of current and future weapons that together can and will strike from the sea, air, and land. These weapons capitalize on key system attributes (e.g. speed, range, lethality, survivability, and commonality) with a strong focus on delivering 'multi-domain' capabilities. The [Navy] Department's Offensive Missile Strategy (OMS) supports a wider, more systematic approach towards delivering offensive weapons balance to increase overall force effectiveness to address emerging threats.
>
> Our current OMS construct has three pillars. First, the Department will sustain relevant weapon systems. Our objective is to preserve the readiness and capacity of our key strike weapons inventories. Second, the Department will pursue strike weapon capability enhancements. Under this initiative, the Navy will develop near-term capability upgrades to enhance existing weapons that provide critical improvements to our current long-range strike weapons capabilities (e.g. Maritime Strike Tomahawk (MST), LRASM V1.1, SM-6/Block 1B, and the Naval Strike Missile). Third, the Department will develop next-generation strike missile capabilities to address emerging threats.
>
> The OMS is reviewed annually based on current capabilities and emerging threats, and updated to leverage analytical processes/study updates. The results are used to inform annual RDT&E and procurement funding priorities to achieve an optimal mix of offensive strike missile system capabilities. The 2020 OMS is currently being finalized and is a classified document. Additional details about next generation weapons development can be provided in a classified setting.[99]

The issue of the operating range of Navy carrier air wings is a key component of an ongoing debate over the future survivability, utility, and cost-effectiveness of aircraft carriers and their air wings, with critics arguing that the current operating range of Navy carrier air wings will force Navy aircraft carriers to operate well within the ranges of Chinese ASBMs or other A2/AD systems, which could put the carriers' survivability at substantial risk, or alternatively require carriers to operate beyond the range of those Chinese A2/AD systems, in locations that are safer but so far away that the carriers and their air wings will contribute little combat capability.

A key U.S. Navy program for increasing the operating range of Navy carrier air wings is the MQ-25 Stingray program, which is a program to acquire a carrier-based unmanned aerial vehicle (UAV) for use as a tanker for in-flight refueling of manned carrier-based aircraft (with a secondary mission of intelligence, surveillance, and reconnaissance). Some observers, while not necessarily objecting to the MQ-25 program, argue that the Navy should do more to increase the

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Underperforming Anti-Torpedo Torpedoes From Its Supercarriers," *The Drive*, February 5, 2019.

[98] See, for example, James Turnwall, "The Navy Is Losing the Missile Arms Race," *U.S. Naval Institute Proceedings*, November 2019. For a similar discussion regarding U.S. and Chinese air-to-air missiles, see Douglas Barrie, "Will America's Next Long-Range Air-to-Air Missile Match Up to China's?" *Defense One*, October 22, 2019.

[99] Statement of the Honorable James F. Geurts, Assistant Secretary of the Navy, Research, Development and Acquisition ASN(RD&A), and Vice Admiral James W. Kilby, Deputy Chief of Naval Operations, Warfighting Requirements and Capabilities (OPNAV N9), and Lieutenant General Eric Smith, Deputy Commandant, Combat Development and Integration, Commanding General, Marine Corps Combat Development Command, before the Subcommittee on Seapower and Projection Forces of the House Armed Services Committee on the Department of the Navy Fiscal Year 2021 Budget Rrequest for Seapower and Projection Forces, March 4, 2020, p. 20. See also David Lague, "Special Report: U.S. Rearms to Nullify China's Missile Supremacy," *Reuters*, May 6, 2020.

operating range of Navy carrier air wings, such as developing a stealthy, carrier-based UAV capable of penetrating enemy air defenses and striking land targets at very long ranges.

The issue of acquisition policies and the metrics for judging their success is discussed in more detail in another CRS report.[100]

Legislative Activity for FY2022

The Navy's proposed FY2021 budget will be submitted to Congress later this year.

Coverage in Related CRS Reports

A variety of CRS reports cover U.S. Navy programs that in varying degrees can be viewed as responses to, among other things, China's naval modernization effort. These reports include but are not limited to the following:

- CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O'Rourke
- CRS Report RS20643, *Navy Ford (CVN-78) Class Aircraft Carrier Program: Background and Issues for Congress*, by Ronald O'Rourke
- CRS Report RL30563, *F-35 Joint Strike Fighter (JSF) Program*, by Jeremiah Gertler (the JSF program is a joint DOD program with Navy participation)
- CRS In Focus IF11679, *Navy DDG(X) Future Large Surface Combatant Program: Background and Issues for Congress*, by Ronald O'Rourke
- CRS Report RL32418, *Navy Virginia (SSN-774) Class Attack Submarine Procurement: Background and Issues for Congress*, by Ronald O'Rourke
- CRS Report RL32109, *Navy DDG-51 and DDG-1000 Destroyer Programs: Background and Issues for Congress*, by Ronald O'Rourke
- CRS Report R44972, *Navy Constellation (FFG-62) Class Frigate (Previously FFG[X]) Program: Background and Issues for Congress*, by Ronald O'Rourke
- CRS Report R46374, *Navy Light Amphibious Warship (LAW) Program: Background and Issues for Congress*, by Ronald O'Rourke
- CRS Report RL33745, *Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress*, by Ronald O'Rourke
- CRS Report R44175, *Navy Lasers, Railgun, and Gun-Launched Guided Projectile: Background and Issues for Congress*, by Ronald O'Rourke
- CRS Report R45757, *Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress*, by Ronald O'Rourke

[100] See CRS Report R43838, *Renewed Great Power Competition: Implications for Defense—Issues for Congress*, by Ronald O'Rourke.

FY2021 National Defense Authorization Act (H.R. 6395/S. 4049/P.L. 116-283)

House

The House Armed Services Committee, in its report (H.Rept. 116-442 of July 9, 2020) on H.R. 6395, states "The committee continues to support the 355-ship fleet codified in the National Defense Authorization Act for Fiscal Year 2018 (P.L. 115-91) as an essential part of the National Defense Strategy and its emphasis on near-peer competitors such as Russia and China." (Page 17)

Section 1251 of H.R. 6395 as reported by the committee states:

> SEC. 1251. INDO-PACIFIC REASSURANCE INITIATIVE.
>
> (a) SENSE OF CONGRESS.—It is the sense of Congress that—
>
> (1) a stable, peaceful, and secure Indo-Pacific region is vital to United States economic and na tional security;
>
> (2) revisionist states, rogue states, violent extremist organizations, and natural and manmade disasters are persistent challenges to regional stability and security;
>
> (3) maintaining stability and upholding a rules based order requires a holistic United States strategy that—
>
> (A) synchronizes all elements of national power;
>
> (B) is inclusive of United States allies and partner countries; and
>
> (C) ensures a persistent, predictable United States presence to reinforce regional defense;
>
> (4) enhancing regional defense requires robust efforts to increase capability, readiness, and responsiveness to deter and mitigate destabilizing activities;
>
> (5) the Department of Defense should pursue an integrated program of activities to—
>
> (A) reassure United States allies and partner countries in the Indo-Pacific region;
>
> (B) appropriately prioritize activities and resources to implement the National Defense Strategy; and
>
> (C) enhance the ability of Congress to provide oversight of and support to Department of
>
> Defense efforts;
>
> (6) an integrated, coherent, and strategic program of activities in the Indo-Pacific region, similar to the European Deterrence Initiative (originally the European Reassurance Initiative), will enhance United States presence and positioning, allow for additional exercises, improve infrastructure and logistics, and build allied and partner capacity to deter aggression, strengthen ally and partner interoperability, and demonstrate United States commitment to Indo-Pacific countries;
>
> (7) an integrated, coherent, and strategic program of activities in the Indo-Pacific region will also assist in resourcing budgetary priorities and enhancing transparency and oversight of programs and activities to better enable a coordinated and strategic plan for Department of Defense programs;
>
> (8) not less than $3,578,360,000 of base funding should be allocated to fully support such program of activities in fiscal year 2021; and

(9) the Department of Defense should ensure adequate, consistent planning is conducted for future funding and build upon the activities identified in fiscal year 2021 in future budget requests, as appropriate.

(b) INDO-PACIFIC REASSURANCE INITIATIVE.—The Secretary of Defense shall carry out a program of prioritized activities to reassure United States allies and partner countries in the Indo-Pacific region that shall be known as the ''Indo-Pacific Reassurance Initiative'' (in this section referred to as the ''Initiative'').

(c) OBJECTIVES.—The objectives of the Initiative shall include reassuring United States allies and partner countries in the Indo-Pacific region by—

(1) optimizing the presence of United States Armed Forces in the region;

(2) strengthening and maintaining bilateral and multilateral military exercises and training with such countries;

(3) improving infrastructure in the region to enhance the responsiveness of United States Armed Forces;

(4) enhancing the prepositioning of equipment and materiel in the region; and

(5) building the defense and security capabilities, capacity, and cooperation of such countries.

(d) PLAN RELATING TO TRANSPARENCY FOR THE INDO-PACIFIC REASSURANCE INITIATIVE.—

(1) PLAN REQUIRED.—

(A) IN GENERAL.—Not later than February 1, 2022, and annually thereafter, the Secretary of Defense, in consultation with the Commander of the United States Indo-Pacific Command, shall submit to the congressional defense committees a future years plan on activities and resources of the Initiative.

(B) APPLICABILITY.—The plan shall apply to the Initiative with respect to the first fiscal year beginning after the date of submission of the plan and at least the four succeeding fiscal years.

(2) MATTERS TO BE INCLUDED.—The plan required under paragraph (1) shall include each of the following:

(A) A summary of progress made towards achieving the objectives of the Initiative.

(B) An assessment of resource requirements to achieve such objectives.

(C) An assessment of capabilities requirements to achieve such objectives.

(D) An assessment of logistics requirements, including force enablers, equipment, supplies, storage, and maintenance requirements, to achieve such objectives.

(E) An identification of the intended force structure and posture of the assigned and allocated forces within the area of responsibility of the United States Indo-Pacific Command for the last fiscal year of the plan and the manner in which such force structure and posture support such objectives.

(F) An identification and assessment of required infrastructure and military construction investments to achieve such objectives, including potential infrastructure investments proposed by host countries, new construction or modernization of existing sites that would be funded by the United States, and a master plan that includes the following:

(i) A list of specific locations, organized by country, in which the Commander of the United States Indo-Pacific Command anticipates requiring infrastructure investments to support an enduring or periodic military presence in the region.

(ii) A list of specific infrastructure investments required at each location identified under clause (i), to include the project title and estimated cost of each project.

(iii) A brief explanation for how each location identified under clause (i) and infrastructure investments identified under clause (ii) support a validated requirement or component of the overall strategy in the region.

(iv) A discussion of any gaps in the current infrastructure authorities that would preclude implementation of the infrastructure investments identified under clause (ii).

(v) A description of the type and size of military force elements that would maintain an enduring presence or operate periodically from each location identified under clause (i).

(vi) A summary of kinetic and non-kinetic vulnerabilities for current locations and each location identified in clause (i), to include—

(I) the level of risk associated with each vulnerability; and

(II) the proposed mitigations and projected costs to address each such vulnerability, to include—

(aa) hardening and other resilience measures;

(bb) active and passive counter-Intelligence, Surveillance, and Reconnaissance;

(cc) active and passive counter Positioning, Navigation, and Timing;

(dd) air and missile defense capabilities;

(ee) enhanced logistics and sea lines of communication security; and

(ff) other issues identified by the Commander of the United States Indo-Pacific Command.

(G) An assessment of logistics requirements, including force enablers, equipment, supplies, storage, fuel storage and distribution, and maintenance requirements, to achieve such objectives.

(H) An analysis of the challenges to the ability of the United States to deploy significant forces from the continental United States to the Indo-Pacific theater in the event of a major contingency, and a description of the plans of the Department of Defense, including military exercises, to address such challenges.

(I) An assessment and plan for security cooperation investments to enhance such objectives.

(J) A plan to resource United States force posture and capabilities, including—

(i) the infrastructure capacity of existing locations and their ability to accommodate additional United States forces in the Indo-Pacific region;

(ii) the potential new locations for additional United States Armed Forces in the Indo-Pacific region, including an assessment of infrastructure and military construction resources necessary to accommodate such forces;

(iii) a detailed timeline to achieve desired posture requirements;

(iv) a detailed assessment of the resources necessary to achieve the requirements of the plan, including specific cost estimates for each project under the Initiative to support optimized presence, exercises and training, enhanced prepositioning, improved infrastructure, and building partnership capacity; and

(v) a detailed timeline to achieve the force posture and capabilities, including force requirements.

(K) A detailed explanation of any significant modifications of the requirements or resources, as compared to plans previously submitted under paragraph (1).

(L) Any other matters the Secretary of Defense determines should be included.

(3) FORM.—The plan required under paragraph (1) shall be submitted in unclassified form, but may include a classified annex.

(e) BUDGET SUBMISSION INFORMATION.—For fiscal year 2022 and each fiscal year thereafter, the Secretary of Defense shall include in the budget justification materials submitted to Congress in support of the Department of Defense budget for that fiscal year (as submitted with the budget of the President under section 1105(a) of title 31, United States Code)—

(1) the amounts, by budget function and as a separate item, requested for the Department of Defense for such fiscal year for all programs and activities under the Initiative; and

(2) a detailed budget display for the Initiative, including—

(A) with respect to procurement accounts—

(i) amounts displayed by account, budget activity, line number, line item, and line item title; and

(ii) a description of the requirements for each such amounts;

(B) with respect to research, development, test, and evaluation accounts—

(i) amounts displayed by account, budget activity, line number, program element, and program element title; and

(ii) a description of the requirements for each such amount;

(C) with respect to operation and maintenance accounts—

(i) amounts displayed by account title, budget activity title, line number, and subactivity group title; and

(ii) a description of how such amounts will specifically be used;

(D) with respect to military personnel accounts—

(i) amounts displayed by account, budget activity, budget subactivity, and budget subactivity title; and

(ii) a description of the requirements for each such amount; and

(E) with respect to each project under military construction accounts (including with respect to unspecified minor military construction and amounts for planning and design), the country, location, project title, and project amount for each fiscal year.

(f) END OF FISCAL YEAR REPORT.—Not later than November 20, 2022, and annually thereafter, the Secretary of Defense shall submit to the congressional defense committees a report that contains—

(1) a detailed summary of funds obligated for the Initiative during the preceding fiscal year; and

(2) a detailed comparison of funds obligated for the Initiative during the preceding fiscal year to the amount of funds requested for the Initiative for such fiscal year in the materials submitted to Congress by the Secretary in support of the budget of the President for that fiscal year as required by subsection (e), including with respect to each of the accounts described in subparagraphs (A), (B), (C), (D), and

(E) of subsection (e)(2) and the information required under each such subparagraph.

(g) BRIEFINGS REQUIRED.—Not later than March 1, 2023, and annually thereafter, the Secretary of Defense shall provide to the congressional defense committees a briefing on the status of all matters covered by the report required by section (f).

(h) RELATIONSHIP TO BUDGET.—Nothing in this section shall be construed to affect section 1105(a) of title 31, United States Code.

(i) CONFORMING REPEAL.—Section 1251 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91; 131 Stat. 1676) is repealed.

Regarding Section 1251, H.Rept. 116-442 states:

Indo-Pacific Reassurance Initiative

The Department of Defense has identified the Indo-Pacific region as a priority theater. Like the European theater, the committee believes assuring partners and allies in the Indo-Pacific region demonstrates the United States' enduring commitment and believes the Department must better identify efforts to accomplish this objective. The committee notes that section 1251 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91), as amended by section 1253 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232), authorized the Indo-Pacific Stability Initiative to enhance the security and stability of the Indo-Pacific region and required the Department of Defense to provide a future years plan for the activities, capabilities, and resources necessary enhance U.S. presence, improve military infrastructure, logistics, and prepositioning of equipment, and increase bilateral and multilateral military training and exercises but the Department of Defense did not align resources to meet the objectives of the initiative.

Therefore, the committee has identified and authorized not less than $3.58 billion in steady-state activities to serve as the basis for the Indo-Pacific Reassurance Initiative described in a provision elsewhere in this Act, intended to serve a similar construct to the European Deterrence Initiative. These activities include: (1) $1.39 billion towards optimizing the presence of U.S. Armed Forces in the region, including $403.9 million for Operation & Maintenance, Navy, $106.0 million for Operation & Maintenance, Marine Corps, $388.7 million for Operation & Maintenance, Army, $5.8 million for Operation & Maintenance, Air Force, $87.3 million for Operation & Maintenance, Defense Wide, $388.5 million for Research, Development, Test & Evaluation, Defense Wide, and $13.7 million for Procurement, Marine Corps for combatant command core operations, direct mission support, military information support operations, cyber activities, theater special operations commands, intelligence programs, missile defense programs, rotational units, ground and flying hour programs, transportation costs, and other activities; (2) $573.7 million towards strengthening and maintaining bilateral and multilateral military exercises and training with United States allies and partner countries in the region, including $302.0 million for Operation & Maintenance, Navy, $50.3 million for Operation & Maintenance, Marine Corps, $62.6 million for Operation & Maintenance, Army, $30.4 million for Operation & Maintenance, Air Force, and $128.2 million for Operation & Maintenance, Defense Wide, for support to service component training and exercise programs, and the Joint Staff's Combatant Commander Exercise Engagement and Training Transformation Program (CE2T2), and other activities; (3) $750.2 million towards improving infrastructure in the region to enhance the responsiveness of U.S. Armed Forces, including $600.2 million of Military Construction, Navy, $89.0 million of Military Construction, Army, and $61.0 million of Military Construction, Air Force, for military construction projects that directly support U.S. Indo-Pacific Command priorities, and planning and design for U.S. Indo-Pacific Command posture initiatives; (4) $654.7 million towards enhancing the prepositioning of equipment and materiel of the U.S. Armed Forces in the region, including $553.9 million of Operation & Maintenance, Navy, $87.2 million of Operation & Maintenance, Marine Corps, $10.0 million of Operation & Maintenance, Army, and $3.6 million of Operation & Maintenance, Air Force for prepositioning of forces and capabilities, and other activities; and (5) $205.8 million towards building the defense and security capabilities, capacity, and cooperation of allies and partner nations in the region, including $193.8 million of Operation & Maintenance, Defense Wide, for security

> cooperation, $5.8 million of Operation & Maintenance, Navy, for Pacific Partnership, and $6.1 million for the State Partnership Program.
>
> While the committee considers these activities as the basis of the Indo-Pacific Reassurance Initiative, the committee expects the Department of Defense to review and further identify activities to meet the Initiative's objectives, as appropriate. The committee also expects the Department's efforts to be guided by a whole-of-government strategy that informs resource requirements. To ensure continued transparency, the committee will require regularized reports and briefings to allow the committee to conduct oversight of the Department's progress in expanding the Indo-Pacific Reassurance Initiative and ensure the Department is meeting the Initiative's objectives. (Pages 208-209)

Also regarding Section 1251, H.Rept. 116-442 states:

> Section 1251—Indo-Pacific Reassurance Initiative
>
> This section would direct the Secretary of Defense to carry out a program of prioritized activities to reassure United States allies and partners, appropriately prioritize activities and resources to implement the National Defense Strategy, and enhance the ability of Congress to provide oversight of and support to Department of Defense efforts. It would define five objectives for an Indo-Pacific Reassurance Initiative: (1) optimizing the presence of U.S. Armed Forces in the Indo-Pacific; (2) strengthening and maintaining bilateral and multilateral military exercises and training with partners and allies in the Indo-Pacific; (3) improving infrastructure in the Indo-Pacific to enhance the responsiveness of U.S. Armed Forces; (4) enhancing the prepositioning of equipment and materiel in the Indo-Pacific; and (5) building the defense and security capabilities, capacity, and cooperation of partners and allies in the Indo-Pacific. This section would also require a future years plan on activities and resources of the Initiative, a budget justification for the Initiative, an end of fiscal year report, and a briefing on funds obligated for the Initiative. (Page 223)

Section 1265 of H.R. 6395 as reported by the committee states

> SEC. 1265. REPORT ON DIRECTED USE OF FISHING FLEETS.
>
> Not later than 180 days after the date of the enactment of this Act, the Commander of the Office of Naval Intelligence shall submit to the congressional defense committees, the Committee on Foreign Affairs of the House of Representatives, and the Committee on Foreign Relations of the Senate an unclassified report on the use of distant-water fishing fleets by foreign governments as extensions of such countries' official maritime security forces, including the manner and extent to which such fishing fleets are leveraged in support of naval operations and foreign policy more generally. The report shall also consider the threats, on a country-by-country basis, posed by such use of distant-water fishing fleets to—
>
> (1) fishing or other vessels of the United States and partner countries;
>
> (2) United States and partner naval and coast guard operations; and
>
> (3) other interests of the United States and partner countries.

Senate

The Senate Armed Services Committee, in its report (S.Rept. 116-236 of June 24, 2020) on S. 4049, states "The committee continues to support the national policy of achieving at least a 355-ship fleet, as codified in the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91), which is integral to the National Defense Strategy and its emphasis on near-peer competition with Russia and China." (Page 49)

S.Rept. 116-236 also states

Anti-ship missile development

The committee is encouraged by increased attention across the Department of Defense to the surface warfare mission area, including several new anti-ship missile (ASM) programs. However, the committee desires greater clarity on Joint Force ASM requirements, development efforts, and acquisition strategies. The committee is interested in ensuring that rigorous ASM requirements exist tied to specific threats and operational concepts, development efforts are rationalized where possible, and acquisition strategies are streamlined.

Therefore, the committee directs the Vice Chairman of the Joint Chiefs of Staff, the Under Secretary of Defense for Research and Engineering, and the Under Secretary of Defense for Acquisition and Sustainment, in consultation with the Secretaries of the military departments, to submit a report to the congressional defense committees not later than December 1, 2020, on Joint Force ASM requirements, development efforts, and acquisition strategies.

This report shall include the following elements: (1) A description of Joint Requirements Oversight Council-validated (JROC-validated) requirements for ASMs, including inventory objectives and capabilities required for each ASM, such as range, speed, seeker performance, and data link requirements; (2) A description of other Department of Defense requirements for ASMs that have not been validated by the JROC, including inventory objectives and capabilities required for each ASM, such as range, speed, seeker performance, and data link requirements; (3) A description of the development efforts supporting each ASM program listed under (1) and (2), such as prototyping subsystems, investigating use of common components, conducting developmental testing, conducting operational testing, and engaging in other forms of risk reduction; and (4) A description of the acquisition strategies, if applicable, for each ASM program listed under (1) and (2) above. (Pages 44-45)

S.Rept. 116-236 also states

Increase in basic research, Navy

The budget request included $467.2 million in Research, Development, Test, and Evaluation (RDT&E), Navy, for PE 61153N Defense Research Sciences.

The committee recognizes the ‘‘increasingly complex security environment’’ detailed in the National Defense Strategy and born from rapid technological change, challenges from adversaries in every operating domain, and decreased readiness derivative of the longest continuous stretch of armed conflict in U.S. history. Accordingly, it is crucial to adequately fund, resource, and structure the Department of Defense to conduct RDT&E activities for critical emerging technologies to stay ahead of our adversaries, most notably Russia and China. Resources must be devoted and responsibly spent toward research and development of artificial intelligence, quantum computing, hypersonics, directed energy, biotechnology, autonomy, cyber, space, 5G, microelectronics, and fully networked command, control, and communications technologies. As such, the committee encourages rapid development, prototyping, testing, and acquisition of these emerging technologies in order to remain ahead of our adversaries.

Therefore, the committee recommends an increase of $10.0 million in RDT&E, Navy, for PE 61153N Defense Research Sciences to support additional basic research. (Page 93)

Section 1251 of S. 4049 as reported by the committee states

SEC. 1251. PACIFIC DETERRENCE INITIATIVE.

(a) In General.—The Secretary of Defense shall carry out an initiative to ensure the effective implementation of the National Defense Strategy with respect to the Indo-Pacific

region, to be known as the "Pacific Deterrence Initiative" (in this section referred to as the "Initiative").

(b) Purpose.—The purpose of the Initiative is to carry out only the following activities:

(1) Activities to increase the lethality of the joint force in the Indo-Pacific region, including, but not limited to—

(A) by improving active and passive defenses against theater cruise, ballistic, and hypersonic missiles for bases, operating locations, and other critical infrastructure at locations west of the International Date Line; and

(B) procurement and fielding of—

(i) long-range precision strike systems to be stationed or pre-positioned west of the International Date Line;

(ii) critical munitions to be pre-positioned at locations west of the International Date Line; and

(iii) command, control, communications, computers and intelligence, surveillance, and reconnaissance systems intended for stationing or operational use in the Indo-Pacific region.

(2) Activities to enhance the design and posture of the joint force in the Indo-Pacific region, including, but not limited to, by—

(A) transitioning from large, centralized, and unhardened infrastructure to smaller, dispersed, resilient, and adaptive basing at locations west of the International Date Line;

(B) increasing the number and capabilities of expeditionary airfields and ports in the Indo-Pacific region available for operational use at locations west of the International Date Line;

(C) enhancing pre-positioned forward stocks of fuel, munitions, equipment, and materiel at locations west of the International Date Line;

(D) increasing the availability of strategic mobility assets in the Indo-Pacific region;

(E) improving distributed logistics and maintenance capabilities in the Indo-Pacific region to ensure logistics sustainment while under persistent multidomain attack; and

(F) increasing the presence of the Armed Forces at locations west of the International Date Line.

(3) Activities to strengthen alliances and partnerships, including, but not limited to, by—

(A) building capacity of allies and partners; and

(B) improving—

(i) interoperability and information sharing with allies and partners; and

(ii) information operations capabilities in the Indo-Pacific region, with a focus on reinforcing United States commitment to allies and partners and countering malign influence.

(4) Activities to carry out a program of exercises, experimentation, and innovation for the joint force in the Indo-Pacific region.

(c) Plan Required.—Not later than February 15, 2021, the Secretary, in consultation with the Commander of the United States Indo-Pacific Command, shall submit to the congressional defense committees a plan to expend not less than the amounts authorized to be appropriated under subsection (e)(2).

(d) Budget Display Information.—The Secretary shall include in the materials of the Department of Defense in support of the budget of the President (submitted to Congress

pursuant to section 1105 of title 31, United States Code) for fiscal year 2022 and each fiscal year thereafter a detailed budget display for the Initiative that includes the following information:

(1) A future-years plan with respect to activities and resources for the Initiative for the applicable fiscal year and not fewer than the four following fiscal years.

(2) With respect to procurement accounts—

(A) amounts displayed by account, budget activity, line number, line item, and line item title; and

(B) a description of the requirements for such amounts specific to the Initiative.

(3) With respect to research, development, test, and evaluation accounts—

(A) amounts displayed by account, budget activity, line number, program element, and program element title; and

(B) a description of the requirements for such amounts specific to the Initiative.

(4) With respect to operation and maintenance accounts—

(A) amounts displayed by account title, budget activity title, line number, and subactivity group title; and

(B) a description of the specific manner in which such amounts will be used.

(5) With respect to military personnel accounts—

(A) amounts displayed by account, budget activity, budget subactivity, and budget subactivity title; and

(B) a description of the requirements for such amounts specific to the Initiative.

(6) With respect to each project under military construction accounts (including with respect to unspecified minor military construction and amounts for planning and design), the country, location, project title, and project amount by fiscal year.

(7) With respect to the activities described in subsection (b)—

(A) amounts displayed by account title, budget activity title, line number, and subactivity group title; and

(B) a description of the specific manner in which such amounts will be used.

(8) With respect to each military service—

(A) amounts displayed by account title, budget activity title, line number, and subactivity group title; and

(B) a description of the specific manner in which such amounts will be used.

(9) With respect to the amounts described in each of paragraphs (2)(A), (3)(A), (4)(A), (5)(A), (6), (7)(A), and (8)(A), a comparison between—

(A) the amount in the budget of the President for the following fiscal year; and

(B) the amount projected in the previous budget of the President for the following fiscal year.

(e) Authorization Of Appropriations.—There are authorized to be appropriated to the Secretary to carry out the activities of the Initiative described in subsection (b) the following:

(1) For fiscal year 2021, $1,406,417,000, as specified in the funding table in section 4502.

(2) For fiscal year 2022, $5,500,000,000.

(f) Repeal.—Section 1251 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91; 131 Stat. 1676), as most recently amended by section 1253 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232; 132 Stat. 2054), is repealed.

Regarding Section 1251, S.Rept. 116-236 states

Pacific Deterrence Initiative (sec. 1251)

The committee recommends a provision that would require the Secretary of Defense to carry out the Pacific Deterrence Initiative (PDI) to ensure the effective implementation of the National Defense Strategy with respect to the Indo-Pacific region. The provision would describe the activities to be carried out under the PDI: (1) Activities to increase the lethality of the Joint Force in the Indo-Pacific region; (2) Activities to enhance the design and posture of the Joint Force in the Indo-Pacific region; (3) Activities to strengthen alliances and partnerships; and (4) Activities to carry out a program of exercises, experimentation, and innovation for the Joint Force in the Indo-Pacific region. The provision would authorize $1.4 billion to be appropriated for the Secretary to carry out PDI in fiscal year 2021, as specified in the funding table in section 4502.

The provision would also authorize $5.5 billion to be appropriated for the Secretary to carry out the PDI in fiscal year 2022. Not later than February 15, 2021, the provision would require the Secretary, in consultation with the Commander, U.S. Indo-Pacific Command, to submit to the congressional defense committees a plan to expend not less than the amounts authorized to be appropriated for the Secretary to carry out the PDI in fiscal year 2022.

The provision would repeal section 1251 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91), as most recently amended by section 1253 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232), which established an authority for an ''Indo-Pacific Stability Initiative.''

The committee notes that the provision would emphasize that specific activities to be carried out under the PDI, particularly those related to the lethality of the Joint Force and the design and posture of the Joint Force, should be focused in and with respect to locations west of the International Date Line. In this way, the committee believes that the PDI will bolster the ''contact'' and ''blunt'' layers described by the Global Operating Model of the National Defense Strategy to maintain the credibility of American deterrence against adversarial aggression in the Indo-Pacific region.

The committee encourages the Secretary of Defense to consider whether a named operation in the Indo-Pacific would improve the execution of the PDI, including through more predictable and sustainable funding, improved joint planning and coordination of training and exercise activities, and increased support for deployments of rotational forces.

The committee notes that the PDI is designed to further the strategic and policy objectives articulated by Congress in the Asia Reassurance Initiative Act (Public Law 115–409) and by the executive branch in the National Security Strategy, the ''Free and Open Indo-Pacific'' strategy of the Department of State, the National Defense Strategy, and the Indo-Pacific strategy report of the Department of Defense.

The committee notes that the provision would require the Department of Defense to submit detailed budgetary display information associated with the PDI in future budget requests. The committee believes that the availability of budgetary data organized according to regional missions and the priorities of the combatant commands is critical for the ability of the Department and the Congress to assess the implementation of the National Defense Strategy. Furthermore, a budgetary display is included elsewhere in this Act that captures spending related to the PDI. The committee encourages the Department of Defense to

continue working with the Congress to improve budgetary transparency in support of its oversight responsibilities. (Pages 301-302)

Conference

In the conference version of H.R. 6395/P.L. 116-283 of January 1, 2021 (H.Rept. 116-617 of December 3, 2020), **Section 1251** states:

SEC. 1251. PACIFIC DETERRENCE INITIATIVE.

(a) IN GENERAL.—The Secretary of Defense shall establish an initiative, to be known as the ''Pacific Deterrence Initiative'' (in this section referred to as the ''Initiative''), to carry out prioritized activities to enhance the United States deterrence and defense posture in the Indo-Pacific region, assure allies and partners, and increase capability and readiness in the Indo-Pacific region.

(b) PURPOSE.—The Initiative required under subsection (a) shall carry out the following prioritized activities to improve the design and posture of the joint force in the Indo-Pacific region, primarily west of the International Date Line:

(1) Modernize and strengthen the presence of the United States Armed Forces, including those with advanced capabilities.

(2) Improve logistics and maintenance capabilities and the pre-positioning of equipment, munitions, fuel, and materiel.

(3) Carry out a program of exercises, training, experimentation, and innovation for the joint force.

(4) Improve infrastructure to enhance the responsiveness and resiliency of the United States Armed Forces.

(5) Build the defense and security capabilities, capacity, and cooperation of allies and partners.

(c) FUNDING.—Of the amounts authorized to be appropriated by this Act for the Department of Defense for fiscal year 2021, $2,234,958,000 is authorized to be made available to carry out the Initiative required under subsection (a), as specified in the funding tables in division D of this Act.

(d) PLAN REQUIRED.—Not later than February 15, 2021, and annually thereafter, the Secretary, in consultation with the Commander of the United States Indo-Pacific Command, shall submit to the congressional defense committees a report on future year activities and resources for the Initiative that includes the following:

(1) A description of the activities and resources for the first fiscal year beginning after the date of submission of the report and the plan for not fewer than the four following fiscal years, organized by the activities described in paragraphs (1) through (5) of subsection (b).

(2) A summary of progress made towards achieving the purposes of the Initiative.

(3) A summary of the activity, resource, capability, infrastructure, and logistics requirements necessary to achieve measurable progress in reducing risk to the joint force's ability to achieve objectives in the region, including through investments in—

(A) active and passive defenses against unmanned aerial systems and theater cruise, ballistic, and hypersonic missiles;

(B) advanced long-range precision strike systems;

(C) command, control, communications, computers, intelligence, surveillance, and reconnaissance systems;

(D) test range capacity, capability, and coordination;

(E) dispersed, resilient, and adaptive basing to support distributed operations, including expeditionary airfields and ports;

(F) advanced critical munitions;

(G) pre-positioned forward stocks of fuel, munitions, equipment, and materiel;

(H) distributed logistics and maintenance capabilities;

(I) strategic mobility assets;

(J) improved interoperability and information sharing with allies and partners;

(K) information operations capabilities;

(L) bilateral and multilateral military exercises and training with allies and partners; and

(M) use of security cooperation authorities to further build partner capacity.

(4) A detailed timeline to achieve the requirements identified under paragraph (3).

(5) A detailed explanation of any significant modifications to such requirements, as compared to plans previously submitted under this subsection.

(6) Any other matter, as determined by the Secretary.

(e) BUDGET DISPLAY INFORMATION.—The Secretary shall include a detailed budget display for the Initiative in the materials of the Department of Defense in support of the budget of the President (submitted to Congress pursuant to section 1105 of title 31, United States Code) for fiscal year 2022 and each fiscal year thereafter that includes the following information:

(1) The resources necessary for the Initiative to carry out the activities required under subsection (b) for the applicable fiscal year and not fewer than the four following fiscal years, organized by the activities described in paragraphs (1) through (5) of that subsection.

(2) With respect to procurement accounts—

(A) amounts displayed by account, budget activity, line number, line item, and line item title; and

(B) a description of the requirements for such amounts specific to the Initiative.

(3) With respect to research, development, test, and evaluation accounts—

(A) amounts displayed by account, budget activity, line number, program element, and program element title; and

(B) a description of the requirements for such amounts specific to the Initiative.

(4) With respect to operation and maintenance accounts—

(A) amounts displayed by account title, budget activity title, line number, and subactivity group title; and

(B) a description of the specific manner in which such amounts will be used.

(5) With respect to military personnel accounts—

(A) amounts displayed by account, budget activity, budget subactivity, and budget subactivity title; and (B) a description of the requirements for such amounts specific to the Initiative.

(6) With respect to each project under military construction accounts (including with respect to unspecified minor military construction and amounts for planning and design), the country, location, project title, and project amount by fiscal year.

(7) With respect to the activities described in subsection (b)—

(A) amounts displayed by account title, budget activity title, line number, and subactivity group title; and

(B) a description of the specific manner in which such amounts will be used.

(8) With respect to each military service—

(A) amounts displayed by account title, budget activity title, line number, and subactivity group title; and

(B) a description of the specific manner in which such amounts will be used.

(9) With respect to the amounts described in each of paragraphs (2)(A), (3)(A), (4)(A), (5)(A), (6), (7)(A), and (8)(A), a comparison between—

(A) the amount in the budget of the President for the following fiscal year;

(B) the amount projected in the previous budget of the President for the following fiscal year;

(C) a detailed summary of funds obligated for the Initiative during the preceding fiscal year; and

(D) a detailed comparison of funds obligated for the Initiative during the previous fiscal year to the amount of funds requested for such fiscal year.

(f) BRIEFINGS REQUIRED.—Not later than March 1, 2021, and annually thereafter, the Secretary shall provide to the congressional defense committees a briefing on the budget proposal and programs, including the budget display information for the applicable fiscal year required by subsection (e).

(g) REPEAL.—Section 1251 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91; 131 Stat. 1676), as most recently amended by section 1253 of the John S. McCain National Defense Authorization Act for fiscal year 2019 (Public Law 115–232; 132 Stat. 2054), is repealed.

Regarding Section 1251, H.Rept. 116-617 stated:

Pacific Deterrence Initiative (sec. 1251)

The House bill contained a provision (sec. 1251) that would express the sense of Congress that the Secretary of Defense should pursue an integrated program of activities to reassure partners and prioritize activities in the Indo-Pacific region. The provision would express the sense of Congress that such program should be funded at a base funding level of $3.6 billion in fiscal year 2021. The provision would also require the Secretary of Defense to implement a program, named the Indo-Pacific Reassurance Initiative, that would include a set of objectives and activities in the region. Additionally, the provision would require the Secretary to submit to the congressional defense committees a future years plan on activities and resources of the Initiative.

The Senate amendment contained a similar provision (sec. 1251) that would require the Secretary of Defense to carry out the Pacific Deterrence Initiative (PDI) to ensure the effective implementation of the National Defense Strategy with respect to the Indo-Pacific region. The provision would describe the activities to be carried out under the PDI: (1) Activities to increase the lethality of the Joint Force in the Indo-Pacific region; (2) Activities to enhance the design and posture of the Joint Force in the Indo-Pacific region; (3) Activities to strengthen alliances and partnerships; and (4) Activities to carry out a

program of exercises, experimentation, and innovation for the Joint Force in the Indo-Pacific region. The provision would authorize $1.4 billion to be appropriated for the Secretary to carry out PDI in fiscal year 2021, as specified in the funding table in section 4502, and $5.5 billion for fiscal year 2022.

The House recedes with an amendment that would require the Secretary of Defense to carry out the Pacific Deterrence Initiative to prioritize activities in support of enhancing U.S. deterrence and defense posture, reassuring allies and partners, and increasing readiness and capability in the Indo-Pacific region, primarily west of the International Date Line. The provision delineates five purposes or lines of effort and authorizes $2.2 billion in fiscal year 2021. The provision would require the Secretary of Defense, in consultation with the Commander of Indo-Pacific Command, to deliver annually a report to the Congress that comprehensively describes ongoing and proposed PDI activities in the Indo-Pacific region, including a detailed budget display and subsequent briefings. The conferees believe that the availability of budgetary data organized according to regional missions and the priorities of the combatant commands is critical for the ability of the Department and the Congress to assess the implementation of the National Defense Strategy. Furthermore, a budgetary display is included elsewhere in this Act that captures spending related to the PDI. The conferees encourage the Department of Defense to continue working with the Congress to improve budgetary transparency in support of its oversight responsibilities.

The conferees appreciate the report submitted by the Commander, Indo-Pacific Command, required by section 1253 of the National Defense Authorization Act for Fiscal Year 2020 (Public Law 116–92), which included the commander's independent assessment of requirements in the area of operations. Therefore, the conferees direct the Commander, Indo-Pacific Command, to deliver to the Committees on Armed Services of the Senate and the House of Representatives an updated section 1253 briefing covering fiscal year 2022 and the five succeeding fiscal years not later than March 1, 2021. Additionally, the conferees direct the chiefs of the military services to deliver a coordinated briefing on the respective services' ongoing contributions to the purposes outlined under PDI and independent assessments of their requirements in the Indo-Pacific region, primarily west of the International Date Line. The briefing by the chiefs of the military services shall be provided to the congressional defense committees not later than April 1, 2021. The conferees strongly urge the Department of Defense to prioritize the Initiative and submit a budget request for fiscal year 2022 that includes additional activities identified as meeting the objectives of the initiative, and believe $5.5 billion is appropriate for the PDI in fiscal year 2022.

The conferees recognize that the spending levels between base and Overseas Contingency Operations funding in the President's budget for fiscal year 2021 were determined by the Congress in the Bipartisan Budget Act of 2019 (Public Law 116–37). However, the conferees remain concerned that several activities identified by the Committees on Armed Services of the Senate and the House of Representatives as meeting the definition of the Pacific Deterrence Initiative were funded in the Overseas Contingency Operations budget for fiscal year 2021, such as Pacific Defender 2021. The conferees expect the Department of Defense's budget submission for Pacific Deterrence Initiative activities to be fully supported from base budget accounts beginning in fiscal year 2022. The activities necessary to fulfill the purpose of the Initiative are anticipated and ongoing and should be the result of the optimized planning processes that inform the base budget. As with the European Deterrence Initiative, the combatant commanders—along with U.S. allies and partners—require the stability of planning and funding reinforced in those processes.

The conferees also note that the House Report accompanying H.R. 6395 (H. Rept. 116–442) of the National Defense Authorization Act for Fiscal Year 2021 directed the Secretary of Defense to provide a report on the activities and resources necessary to achieve the objectives of the Indo-Pacific Reassurance Initiative, including a plan to resource U.S. force posture and capabilities and to identify and assess the required infrastructure, military

construction investments, and logistics needs for the region, not later than February 1, 2021. The conferees strongly urge the Department to provide such an infrastructure master plan on time to ensure the congressional defense committees are able to meet their oversight responsibilities and ensure the Department's resource requirements are forward-looking and driven by strategy. (Pages 1789-1791)

Section 1260I of the conference version of H.R. 6395 states:

SEC. 1260I. REPORT ON DIRECTED USE OF FISHING FLEETS.

(a) REPORT REQUIRED.—Not later than 180 days after the date of the enactment of this Act, the Commander of the Office of Naval Intelligence shall submit to the appropriate congressional committees an unclassified report on the use of distant-water fishing fleets by foreign governments as extensions of such countries' official maritime security forces, including the manner and extent to which such fishing fleets are leveraged in support of naval operations and foreign policy more generally. The report shall also consider the threats, on a country-by-country basis, posed by such use of distantwater fishing fleets to—

(1) fishing or other vessels of the United States and partner countries;

(2) United States and partner naval and coast guard operations; and

(3) other interests of the United States and partner countries.

(b) APPROPRIATE CONGRESSIONAL COMMITTEES DEFINED.—For purposes of this section, the term ''appropriate congressional committees'' means—

(1) the congressional defense committees;

(2) the Committee on Foreign Relations and the Committee on Commerce, Science, and Transportation of the Senate; and (3) the Committee on Foreign Affairs and the Committee on Energy and Commerce of the House of Representatives.

Appendix A. Comparing U.S. and Chinese Naval Capabilities

This appendix presents some additional discussion of factors involved in 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 the total number of ships in a navy (or a navy's aggregate tonnage) is relatively easy to calculate, it is a one-dimensional measure that leaves out numerous other factors that bear on a navy's capabilities and how those capabilities compare to its assigned missions. One-dimensional comparisons of the total numbers of ships in China's navy and the U.S. Navy are highly problematic as a means of assessing relative U.S. and Chinese naval capabilities and how those capabilities compare to the missions assigned to those navies, for the following reasons:

- **A fleet's total number of ships (or its aggregate tonnage) is only a partial metric of its capability.** Many factors other than ship numbers (or aggregate tonnage) contribute to naval capability, including 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. In light of this, 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. In recent years, the warfighting capabilities of navies have derived increasingly from the sophistication of their internal electronics and software. This factor can vary greatly from one navy to the next, and often cannot be easily assessed by outside observation. As the importance of internal electronics and software has grown, the idea of comparing the warfighting capabilities of navies principally on the basis of easily observed factors such as ship numbers and tonnages has become increasingly less reliable, and today is highly problematic.
- **Total numbers of ships of a given type (such as submarines or surface combatants) 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 a number of other factors, including 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).
- **A focus on total ship numbers reinforces the notion that changes in total numbers necessarily translate into corresponding or proportional changes in aggregate capability.** For a Navy like China's, which is modernizing by replacing older, obsolescent ships with more modern and more capable ships, this is not necessarily the case. As shown in **Table 1** and **Table 2**, for example, China's attack submarine force today has only a slightly larger number of boats than it had in 2000 or 2005, but it has considerably more aggregate capability than it did in 2000 or 2005, because the force today includes a much larger percentage of relatively modern designs.

- **Comparisons of total numbers of ships (or aggregate tonnages) do not take into account the differing global responsibilities and homeporting locations of each fleet.** The U.S. Navy has substantial worldwide responsibilities, and a substantial fraction of the U.S. fleet is homeported in the Atlantic. As a consequence, only a certain portion of the U.S. Navy might be available for a crisis or conflict scenario in China's near-seas region, or could reach that area within a certain amount of time. In contrast, China's navy has more-limited responsibilities outside China's near-seas region, and its ships are all homeported along China's coast at locations that face directly onto China's near-seas region. In a U.S.-China conflict inside the first island chain, U.S. naval and other forces would be operating at the end of generally long supply lines, while Chinese naval and other forces would be operating at the end of generally short supply lines.
- **Comparisons of numbers of ships (or aggregate tonnages) do not take into account maritime-relevant military capabilities that countries might have outside their navies,** such as land-based anti-ship ballistic missiles (ASBMs), land-based anti-ship cruise missiles (ASCMs), and land-based Air Force aircraft armed with ASCMs or other weapons. Given the significant maritime-relevant non-navy forces present in both the U.S. and Chinese militaries, this is a particularly important consideration in comparing U.S. and Chinese military capabilities for influencing events in the Western Pacific. Although a U.S.-China incident at sea might involve only navy units on both sides, a broader U.S.-China military conflict would more likely be a force-on-force engagement involving multiple branches of each country's military.
- **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. Although Navy A might have less capability than Navy B, Navy A might nevertheless be better able to perform Navy A's intended missions than Navy B is to perform Navy B's intended missions. This is another significant consideration in assessing U.S. and Chinese naval capabilities, because the missions of the two navies are quite different.

A 2015 RAND report attempted to take factors like those discussed above more fully into account with the aim of producing a more comprehensive assessment of relative U.S. and Chinese military capabilities for potential conflict scenarios involving Taiwan and the Spratly Islands in the South China Sea. The report stated the following:

> Over the past two decades, China's People's Liberation Army (PLA) has transformed itself from a large but antiquated force into a capable, modern military. In most areas, its technology and skill levels lag behind those of the United States, but it has narrowed the gap. Moreover, it enjoys the advantage of proximity in most plausible scenarios and has developed capabilities that capitalize on that advantage....
>
> ... four broad trends emerge:
>
> • Since 1996, the PLA has made tremendous strides, and, despite improvements to the U.S. military, the net change in capabilities is moving in favor of China. Some aspects of Chinese military modernization, such as improvements to PLA ballistic missiles, fighter aircraft, and attack submarines, have come extraordinarily quickly by any reasonable historical standard.
>
> • The trends vary by mission area, and relative Chinese gains have not been uniform across all areas. In some areas, U.S. improvements have given the United States new options, or

> at least mitigated the speed at which Chinese military modernization has shifted the relative balance.
>
> • Distances, even relatively short distances, have a major impact on the two sides' ability to achieve critical objectives. Chinese power projection capabilities are improving, but present limitations mean that the PLA's ability to influence events and win battles diminishes rapidly beyond the unrefueled range of jet fighters and diesel submarines. This is likely to change in the years beyond those considered in this report, though operating at greater distances from China will always work, on balance, against China.
>
> • The PLA is not close to catching up to the U.S. military in terms of aggregate capabilities, but it does not need to catch up to the United States to dominate its immediate periphery. The advantages conferred by proximity severely complicate U.S. military tasks while providing major advantages to the PLA. This is the central finding of this study and highlights the value of campaign analysis, rather than more abstract assessments of capabilities.
>
> Over the next five to 15 years, if U.S. and PLA forces remain on roughly current trajectories, Asia will witness a progressively receding frontier of U.S. dominance. The United States would probably still prevail in a protracted war centered in virtually any area, and Beijing should not infer from the above generalization that it stands to gain from conflict. U.S. and Chinese forces would likely face losses on a scale that neither has suffered in recent decades. But PLA forces will become more capable of establishing temporary local air and naval superiority at the outset of a conflict. In certain regional contingencies, this temporal or local superiority might enable the PLA to achieve limited objectives without "defeating" U.S. forces. Perhaps even more worrisome from a military-political perspective, the ability to contest dominance might lead Chinese leaders to believe that they could deter U.S. intervention in a conflict between it and one or more of its neighbors. This, in turn, would undermine U.S. deterrence and could, in a crisis, tip the balance of debate in Beijing as to the advisability of using force....
>
> Although trends in the military balance are running against the United States, there are many actions that the United States could take to reinforce deterrence and continue to serve as the ultimate force for stability in the Western Pacific.[101]

As mentioned earlier, while comparisons of the total numbers of ships in China's Navy and the U.S. Navy are highly problematic as a means of assessing relative U.S. and Chinese naval capabilities and how those capabilities compare to the missions assigned to those navies, an examination of *the trends over time in the relative numbers of ships* can shed some light on how the relative balance of U.S. and Chinese naval capabilities might be changing over time.

[101] Eric Heginbotham, *The U.S.-China Military Scorecard, Forces, Geography, and the Evolving Balance of Power, 1996-2017*, Santa Monica (CA), RAND Corporation, 2015 (RAND report RR-392), pp. xix, xxx-xxxii.

Appendix B. U.S. Navy's Ability to Counter Chinese ASBMs

This appendix provides additional discussion of the issue of the U.S. Navy's ability to counter China's ASBMs.

Although China's projected ASBM, as a new type of weapon, might be considered a "game changer," that does not mean it cannot be countered. There are several potential approaches for countering an ASBM that can be imagined, and these approaches could be used in combination. The ASBM is not the first "game changer" that the Navy has confronted; the Navy in the past has developed counters for other new types of weapons, such as ASCMs, and is likely exploring various approaches for countering ASBMs.

Countering China's projected ASBMs could involve employing a combination of active (i.e., "hard-kill") measures, such as shooting down ASBMs with interceptor missiles, and passive (i.e., "soft-kill") measures, such as those for masking the exact location of Navy ships or confusing ASBM reentry vehicles. Employing a combination of active and passive measures would attack various points in the ASBM "kill chain"—the sequence of events that needs to be completed to carry out a successful ASBM attack. This sequence includes detection, identification, and localization of the target ship, transmission of that data to the ASBM launcher, firing the ASBM, and having the ASBM reentry vehicle find the target ship.

Attacking various points in an opponent's kill chain is an established method for countering an opponent's military capability. A September 30, 2011, press report, for example, quotes Lieutenant General Herbert Carlisle, the Air Force's deputy chief of staff for operations, plans, and requirements, as stating in regard to Air Force planning that "We've taken [China's] kill chains apart to the 'nth' degree."[102]

To attack the ASBM kill chain, Navy surface ships, for example, could operate in ways (such as controlling electromagnetic emissions or using deception emitters) that make it more difficult for China to detect, identify, and track those ships.[103] The Navy could acquire weapons and systems for disabling or jamming China's long-range maritime surveillance and targeting systems, for attacking ASBM launchers, for destroying ASBMs in various stages of flight, and for decoying and confusing ASBMs as they approach their intended targets. Options for destroying ASBMs in flight include the SM-3 midcourse BMD interceptor missile (including the new Block IIA

[102] David A. Fulghum, "USAF: Slash And Burn Defense Cuts Will Cost Missions, Capabilities," *Aerospace Daily & Defense Report*, September 30, 2011: 6.

[103] For a journal article discussing actions by the Navy during the period 1956-1972 to conceal the exact locations of Navy ships, see Robert G. Angevine, "Hiding in Plain Sight, The U.S. Navy and Dispersed Operations Under EMCON, 1956-1972," *Naval War College Review*, Spring 2011: 79-95. See also Jonathan F. Sullivan, Defending the Fleet From China's Anti-Ship Ballistic Missile: Naval Deception's Roles in Sea-Based Missile Defense, A Thesis submitted to the Faculty of the Graduate School of Arts and Sciences of Georgetown University in partial fulfillment of the requirements for the degree of Master of Arts in Security Studies, April 15, 2011, accessed August 10, 2011, at http://gradworks.umi.com/1491548.pdf; Jon Solomon, "Deception and the Backfire Bomber: Reexamining the Late Cold War Struggle Between Soviet Maritime Reconnaissance and U.S. Navy Countertargeting," *Information Dissemination* (*www.informationdissemination.net*), October 27, 2014; John Solomon, "Deception and the Backfire Bomber, Part II," *Information Dissemination* (*www.informationdissemination.net*), October 28, 2014; John Solomon, "Deception and the Backfire Bomber, Part III," *Information Dissemination* (*www.informationdissemination.net*), October 29, 2014; John Solomon, "Deception and the Backfire Bomber, Part IV," *Information Dissemination* (*www.informationdissemination.net*), October 30, 2014.

version), the SM-6 terminal-defense BMD interceptor missile,[104] and accelerating development and deployment of the hypervelocity projectile (HVP), electromagnetic rail gun (EMRG), and solid state lasers (SSLs).[105] Options for decoying and confusing ASBMs as they approach their intended targets include equipping ships with systems, such as electronic warfare systems or systems for generating radar-opaque smoke clouds or radar-opaque carbon-fiber clouds, that could confuse an ASBM's terminal-guidance radar.[106]

An October 4, 2016, press report states the following:

> Several times in the past, [Chief of Naval Operations John] Richardson has stressed that long range weapons developments from adversarial nations like Russia and China aren't the end-all, be-all of naval conflicts.
>
> Just because China's "carrier-killer" missile has a greater range than the planes aboard a US aircraft carrier doesn't mean the US would shy away from deploying a carrier within that range, Richardson has stated on different occasions.
>
> Again, Richardson challenged the notion that a so-called A2/AD zone was "an impenetrable keep out zone that forces can only enter at extreme peril to their existence, let alone their mission."
>
> Richardson took particular issue with the "denial" aspect of A2/AD, repeating his assertion that this denial is an "aspiration" not a "fait accompli." The maps so common in representing these threats often mark off the limits of different system's ranges with "red arcs that extend off coastlines," with the implication that military forces crossing these lines face "certain destruction."
>
> But this is all speculation according to Richardson: "The reality is far more complex, it's actually really hard to achieve a hit. It requires the completion of a really complex chain of events.... these arcs represent danger for sure... but the threats they are based on are not insurmountable, and can be managed, will be managed."
>
> "We can fight from within these defended areas, and we will... this is nothing new and has been done before," said Richardson.
>
> So while Russia and China can develop missiles and radars and declare their ranges on paper, things get a lot trickier in the real world, where the US has the most and best experience in operating.
>
> "Potential adversaries actually have different geographic features like choke points, islands, ocean currents, mountains," said Richardson, who urged against oversimplifying complicated, and always unique circumstances in so-called A2/AD zones.
>
> "Have no doubt, the US navy is prepared to go wherever it needs to go, at any time, and stay there for as long as necessary in response to our leadership's call to project our strategic influence," Richardson concluded.

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[104] For more on the SM-3, including the Block IIA version, and the SM-6, see CRS Report RL33745, *Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress*, by Ronald O'Rourke.

[105] For more on HVP, EMRG, and SSLs, see CRS Report R44175, *Navy Lasers, Railgun, and Gun-Launched Guided Projectile: Background and Issues for Congress*, by Ronald O'Rourke.

[106] Regarding electronic warfare, see, for example, Brett Tingley, "The Navy's Secretive And Revolutionary Program To Project False Fleets From Drone Swarms," *The Drive*, November 7, 2019. Regarding the option of systems for generating radar-opaque smoke clouds, Thomas J. Culora, "The Strategic Implications of Obscurants," *Naval War College Review*, Summer 2010: 73-84; Scott Tait, "Make Smoke!" U.S. Naval Institute Proceedings, June 2011: 58-63. Regarding radar-opaque carbon-fiber clouds, see "7th Fleet Tests Innovative Missile Defense System," Navy News Services, June 26, 2014; Kevin McCaney, "Navy's Carbon-Fiber Clouds Could Make Incoming Missiles Miss Their Targets," *Defense Systems* (http://defensesystems.com), June 27, 2014. See also Sydney J. Freedberg Jr., "Cyber, EW Are Secret Missile Defense Weapons Too Secret To Use," *Breaking Defense*, December 4, 2015.

Similarly, an August 29, 2016, press report states the following:

> The United States Navy is absolutely confident in the ability of its aircraft carriers and carrier air wings to fly and fight within zones defended by so-called anti-access/area denial (A2/AD) weapons....
>
> In the view of the U.S. Navy leadership, A2/AD—as it is now called—has existed since the dawn of warfare when primitive man was fighting with rocks and spears. Overtime, A2/AD techniques have evolved as technology has improved with ever-greater range and lethality. Rocks and spears eventually gave way to bows and arrows, muskets and cannons. Thus, the advent of long-range anti-ship cruise and ballistic missiles is simply another technological evolution of A2/AD.
>
> "This is the next play in that," Adm. John Richardson, chief of naval operations, told The National Interest on Aug. 25 during an interview in his office in the Pentagon. "This A2/AD, well, it's certainly a goal for some of our competitors, but achieving that goal is much different and much more complicated."
>
> Indeed, as many U.S. Navy commanders including Richardson and Rear Adm. (Upper Half) DeWolfe Miller, the service's director of air warfare, have pointed out, anti-access bubbles defended by Chinese DF-21D or DF-26 anti-ship ballistic missile systems or Russian Bastion-P supersonic anti-ship missile systems are not impenetrable 'Iron Domes.' Nor do formidable Russian and Chinese air defense systems such as the S-400 or HQ-9 necessarily render the airspace they protect into no-go zones for the carrier air wing.
>
> Asked directly if he was confident in the ability of the aircraft carrier and its air wing to fight inside an A2/AD zone protected by anti-ship cruise and ballistic missiles as well as advanced air defenses, Richardson was unequivocal in his answer. "Yes," Richardson said—but he would not say how exactly how due to the need for operational security. "It's really a suite of capabilities, but I actually think we're talking too much in the open about some of the things we're doing, so I want to be thoughtful about how we talk about things so we don't give any of our competitors an advantage."...
>
> Miller said that there have been threats to the carrier since the dawn of naval aviation. In many ways, the threat to the carrier was arguably much greater during the Cold War when the Soviet Union massed entire regiments of Tupolev Tu-22M3 Backfires and deployed massive cruise missile-armed Oscar-class SSGN submarines to hunt down and destroy the Navy's flattops. The service developed ways to defeat the Soviet threat—and the carrier will adapt to fight in the current environment.
>
> "We could have had this interview twenty-years-ago and there would have been a threat," Miller said. "The nature of war and A2/AD is not new—that's my point. I don't want to downplay it, but our improvements in information warfare, electronic warfare, payloads, the weapons systems that we've previously talked about—plus our ability to train to those capabilities that we have—we will create sanctuaries, we'll fight in those sanctuaries and we're a maneuver force."[107]

An October 18, 2017, blog post states the following:

> Assuming the DF-21D is ready for battle, can America defend against China's mighty missile?

[107] Dave Majumdar, "Chief of Naval Operations Richardson: US Aircraft Carriers Can Fight Inside A2/AD Zones," *National Interest*, August 29, 2016. See also Ryan Pickrell, "Navy Admirals Brush Aside Biggest Worry Of Modern Naval Combat," *Daily Caller*, August 31, 2016; Dave Majumdar, "Here Is Why the US Military Is Not In Panic Mode Over China's Carrier-Killer Missiles," *National Interest*, June 20, 2016.

> While opinions are clearly mixed—in speaking to many sources over the last several years on this topic—it seems clear there is great nervousness in U.S. defense circles. However, as time has passed, initial fears have turned towards a more optimistic assessment....
>
> In the end, the weapon might not be the great "game-changer" that many point it out to be, but a great complicator.[108]

A January 28, 2021, press report states:

> The U.S. Navy's top intelligence officer has said the service is watching closely as China expands its anti-ship missile capabilities, particularly in and around the disputed South China Sea, to include the ongoing development of long-range anti-ship ballistic missiles. At the same time, he said he "hopes" that China's People's Liberation Army will continue to invest significant resources into these efforts, hinting that the U.S. Navy already has extensive measures to counter these threats already in use now or in development.
>
> Navy Vice Admiral Jeffrey Trussler, the Deputy Chief of Naval Operations for Information Warfare, made his remarks about China's anti-ship missile arsenal during an online event put on by the non-profit Intelligence and National Security Alliance on Jan. 27, 2021….
>
> … not only did Vice Admiral Trussler seem less concerned about PLA anti-ship missile capabilities than one would expect, he made clear he was happy with them continuing to pour time and resources into those efforts.
>
> "I hope they just keep pouring money into that type of thing," he said. "That may not be how we win the next war."
>
> The clear indication here is that Trussler is aware of countermeasures, whether they be certain systems or tactics, techniques, and procedures, that are either available now or in development. The Vice Admiral did not offer any specific details about what the Navy is doing to go along with these remarks….
>
> We also know that, by 2019, warships assigned to the Navy's 7th Fleet, which is based in Japan, were fitted with the AN/SLQ-59 Transportable Electronic Warfare Modules (TEWM). TEWM is described as a "counter-terminal threat defensive system," indicating that it is designed to help defeat incoming anti-ship missiles, or other threats, such as swarms of small drones, in the final phase of their attack on a ship. Based on the information available, The War Zone previously assessed that the AN/SLQ-59 was most likely acquired in response to growing cruise missile threats, and Chinese developments, in particular, given its fielding first on ships forward-deployed in Japan.
>
> The Navy has also been hard at work developing an entire networked electronic warfare "ecosystem," as part of its shadowy Netted Emulation of Multi-Element Signature against Integrated Sensors program, or NEMESIS. The goal here has been to craft a 'system of systems' comprising of various manned and unmanned ships, as well as submarines and aircraft, equipped with electronic warfare systems that can work together cooperatively. One of the key uses of these capabilities would be to generate signals that mimic real fleets of ships and aircraft to distract and confuse opponents, making it difficult for them to effectively spot and target real Navy assets. These networked electronic warfare platforms could also employ other kinds of electronic warfare tactics across a broad area to protect against various kinds of threats. You can read more about NEMSIS in detail in this past War Zone feature.[109]

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[108] Harry J. Kazianis, "Could China's Aircraft Carrier Killer Missiles 'Sink' the U.S. Navy?" *National Interest*, October 18, 2017. See also Dick Mosier, "Breaking the Anti-Ship Missile Kill Chain," Center for International Maritime Security, February 26, 2018; Richard A. Bitzinger, "The Myth of the 'Game-Changer' Weapon," Asia Times, April 26, 2018.

[109] The article linked at this point is Brett Tingley, "The Navy's Secretive And Revolutionary Program To Project False Fleets From Drone Swarms," *The Drive*, November 7, 2019.

> A highly adaptive and deeply networked electronic warfare ecosystem could be particularly useful against long-range anti-ship missile strikes, especially using ballistic missiles, which would require targeting information from offboard platforms and the ability to send updated information to the weapon during the mid-course stage of flight….
>
> The Navy does have Arleigh Burke class destroyers outfitted specifically for ballistic missile defense, including the ability to launch the SM-3 Block IIA interceptor, which is designed to knock down ballistic missiles during the mid-course portion of their flight. Those ships are also slated to get interceptors designed to bring down hypersonic weapons in the future as part of the Regional Glide Phase Weapon System (RGPWS) program….
>
> The Navy, which has been looking to stop deploying Arleigh Burkes on dedicated missile defense missions, could seek to make more widespread use of the SM-3 Block IIA in the future. Those destroyers and other ships could gain additional missile defense capabilities as the improved Block IB variant of the SM-6 missile begins to enter service. Existing Block I and IA versions of the SM-6 already have the ability to intercept ballistic missiles during the terminal phase of their flight, as well as engage various other aerial and surface threats. The SM-6, in particular, potentially provides a potent defense against anti-ship ballistic missiles, especially those that break through mid-course traditional ballistic missile defenses, if mid-course ballistic missile defense assets are available at all.
>
> There's the possibility that Vice Admiral Trussler is aware of other developments in the classified realm that could further mitigate some or all of these threats, as well. Beyond that, there's no discounting that his public comments, which are certain to be scrutinized by the PLA itself, are a form of misinformation designed to prompt concerns within the Chinese military that its priorities may be, in some way, seriously off base.
>
> Whatever the case, the threat posed by China's anti-ship missile arsenal, which continues to grow in capability, including with the development of new anti-ship ballistic missiles, is real. At the same time, while the Navy obviously knows this, the service seems to be strongly hinting that it feels it making very good progress on getting around these challenges, or at least wants to make the Chinese think so.[110]

Regarding the above-reported remarks by Vice Admiral Trussler, a January 29, 2021, press report stated:

> That confident [U.S. Navy] posture caught the attention of the Chinese military establishment. "What Trussler is saying is that the U.S. has sufficient power to handle the anti-ship missile threat from China," former People's Liberation Army instructor Song Zhongping told the South China Morning Post on Friday [January 29]. "The U.S. is emphasizing that threat and it will further boost its defenses against Chinese missiles."[111]

[110] Joseph Trevithick, "Top Navy Intel Officer Hopes China Will Keep Dumping Money Into Anti-Ship Ballistic Missiles, The Navy Is Strongly Hinting that It Feels It Is Well on Its Way to Mitigating the Very Real Threats Posed by Anti-Ship Ballistic and Cruise Missiles," *The Drive*, January 28, 2021. See also Mallory Shelbourne, "U.S. Admiral: China Can 'Keep Pouring Money' Into Anti-Ship Ballistic Missiles," *USNI News*, January 27, 2021.

[111] Joel Gehrke, "China's 'Carrier Killer' and Military Won't 'Win the Next War,' US admiral Says," *Washington Examiner*, January 29, 2021. The *South China Morning Post* article being cited is Teddy Ng and Minnie Chan, "US Admiral Calls China's Anti-Ship Ballistic Missiles a 'Destabilising Effort' that May Not Win a War," *South China Morning Post*, January 29, 2021.

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