



Geneva Institute of International Relations

# THE RISE OF CHINA'S PEOPLE'S LIBERATION ARMY NAVY

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**China's People's Liberation Army Navy (PLAN)** can be traced back to units of the **Republic of China Navy (ROCN)** who defected to the **People's Liberation Army** towards the end of the Chinese Civil War (1945-49). In 1949, the **People's Liberation Army** tasked the **East China Military Command** with establishing a navy. The **PLAN** quickly grew in size due to defecting Nationalist naval forces joining its ranks. The same year, the Naval Academy was established in Dalian with the help of Soviet instructors. In 1952, the Navy's first aviation school was founded, and the **People's Liberation Army Navy Air Force** was formally established with the mission to support anti-surface and anti-submarine defensive operations.

Between 1954 and 1955, the **PLAN** established the North Sea Fleet, East Sea Fleet, and South Sea Fleet. Natural affinities due to similar political regimes drew **China** and the **USSR** close. Until the 1960s and the Sino-Soviet split, the **Soviet Union** provided assistance to the **PLAN** through naval advisers, equipment, and technology. The modernization of the **PLAN** was significantly hindered by the Great Leap Forward (1958–61) and the Great Proletarian Cultural Revolution (1966–1976). Many experts were wasted in purges, and these specialists were lacking afterward, and any prospects for rapid technological progress in many areas, including missiles, torpedoes, and electronics, were halted. The results were that **PLAN** modernization was delayed by approximately two decades<sup>1</sup>.

The first shift came in the 1970s when the **PLAN** started to focus on developing the structures and processes for a true oceangoing navy. **China** allocated approximately 20% of its defense budget to naval forces, leading to significant growth in the **PLAN**. The conventional submarine force expanded, and the development of nuclear attack submarines (SSN) and nuclear-powered ballistic missile submarines (SSBN) also started<sup>2</sup>. Still, several factors impeded the creation of a large, modern Chinese navy. These included the political aftermath of the Cultural Revolution, the leadership struggles between **Hua Guofeng** and **Deng Xiaoping**, and the limited industrial and technological capabilities available for military modernization. However, **Deng Xiaoping** insisted on the **PLAN**'s role as a coastal defense force<sup>3</sup>.

Until the 1980s, the **PLAN** remained largely a coastal force. The shift came following the fall of the **Soviet Union** in the 1990s as **China** was freed from worrying over land border disputes and a possible invasion. The country, therefore, shifted its military focus to maritime concerns in the South China Sea and the Taiwan Strait. Until then, the **PLAN** had traditionally played a subordinate role to the **People's Liberation Army Ground Force**.

In the 1980s, the modernization of the **PLAN** was driven by indigenous construction, foreign purchases, and reverse engineering of technology obtained by various means from the West. Admiral **Liu Huaqing**, the third Commander-in-Chief of the Navy between 1982 and 1988, initiated transformative reforms, encouraged technological innovation, and advocated

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<sup>1</sup> Bernard Cole, "The History of the Twenty-First-Century Chinese Navy", Center for Security Studies (CSS), 01 July 2014, <https://ethz.ch/content/specialinterest/gess/cis/center-for-securities-studies/en/services/digital-library/articles/article.html/181186>

<sup>2</sup> "People's Liberation Army Navy", Wikipedia, [https://en.wikipedia.org/wiki/People%27s\\_Liberation\\_Army\\_Navy#History](https://en.wikipedia.org/wiki/People%27s_Liberation_Army_Navy#History)

<sup>3</sup> Cole, Bernard D., "The History of the Twenty-First-Century Chinese Navy", Naval War College Review: Vol. 67 : No. 3 , Article 5, <https://digital-commons.usnwc.edu/nwc-review/vol67/iss3/5>

large foreign purchases. Fewer ships were produced compared to the 1970s due to a focus on qualitative improvement in equipment and personnel. Under his impulsion, the **PLAN** shifted from a traditional coastal force to a regional power fleet oriented toward green-water operations sea. The **PLAN** also successfully tested underwater-launched ballistic missiles and developed surface-to-surface and air-to-surface missiles. By 1987, **China** had the third-largest navy in the world. Under his leadership, significant improvements in combined-arms operations, particularly strengthening the Marines and Naval Air Force, happened. At the end of the 1980s, the **PLAN** had about 1,000 ships, with 350 considered oceangoing, and 350,000 personnel, including Naval Air Force, Coastal Defense Forces, and the Marine Corps.

According to the 2018 report<sup>4</sup> on China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress, **China**'s naval modernization effort included the development of anti-ship ballistic missiles (ASBM), anti-ship cruise missiles (ASCMs), land-attack cruise missiles (LACMs), surface-to-air missiles, mines, aircrafts, submarines, aircraft carriers, destroyers, frigates, corvettes, patrol craft, amphibious ships, mine countermeasures (MCM) ships, underway replenishment ships, hospital ships and unmanned vehicles. In 2018, the **PLAN** had more than 300 surface combatants, submarines, amphibious ships, and missile-armed patrol crafts.

In 2021, according to a **U.S. Naval Institute** report, **China** had now become the world's largest navy, with more than 355 vessels in its fleet. The **PLAN** surpassed the **U.S. Navy** in fleet size sometime around 2020. According to the Pentagon's 2022 annual report<sup>5</sup> on China's military development, the Chinese fleet will grow to 400 ships by 2025 and 440 ships by 2030.

In August 2023, **China** unveiled a strategic plan to allocate \$1.4 trillion<sup>6</sup> for modernizing the **People's Liberation Army** between 2024 and 2028, with a focus on the navy. This decision is due to rising geopolitical tensions, concerns over **U.S.** assistance to Taiwan, territorial disputes in the South China Sea, regional security alliances, and **China**'s ambition to assert its influence on the world stage. The strategic focus is on replacing older platforms with more capable units, acquiring a fourth aircraft carrier, and developing the **Type 096** Nuclear-Powered Ballistic Missile Submarine (SSBN), the **Type 054A** frigates, and **Type-55** guided-missile cruisers. **China**'s self-reliant defense manufacturing industry has successfully overcome restrictions on foreign defense technology by leveraging non-defense technology for military applications<sup>7</sup>.

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<sup>4</sup> "China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress", Congressional Research Service, d 01 August 2018, [https://www.everycrsreport.com/files/20180801\\_RL33153\\_1036f8edb5271519e9bd80690adce95f6e5bc6c6.pdf](https://www.everycrsreport.com/files/20180801_RL33153_1036f8edb5271519e9bd80690adce95f6e5bc6c6.pdf)

<sup>5</sup> Sam LaGrone, "Military and Security Developments Involving the Peoples Republic of China 2022", Annual Report to Congress, <https://www.documentcloud.org/documents/23321290-2022-military-and-security-developments-involving-the-peoples-republic-of-china?responsive=1&title=1>

<sup>6</sup> "China to spend \$1.4 trillion over 2024-28 to equip PLA with advanced fleet", APDR, 24 August 2023, <https://asiapacificdefencereporter.com/china-to-spend-1-4-trillion-over-2024-28-to-equip-pla-with-advanced-fleet/>

<sup>7</sup> Sam Lagrone, "Pentagon: Chinese Navy to Expand to 400 Ships by 2025, Growth Focused on Surface Combatants", USNI News, 29 November 2022, <https://news.usni.org/2022/11/29/pentagon-chinese-navy-to-expand-to-400-ships-by-2025-growth-focused-on-surface-combatants>

## I. THE HISTORICAL MISSIONS OF THE PLAN

**China** has been making sovereignty claims on most East and South China Seas based on historical maps dating back to the Ming Dynasty and a line drawn in 1947 by the nationalist government. It has extended its sea claims under the **United Nations Convention on the Law of the Sea (UNCLOS)**, arguing that its continental shelf extends far into the East and South China Seas. These claims are not widely recognized and are considered excessive by most countries. The **PLAN** patrols extensively in these claimed territories to protect what it asserts is its maritime sovereignty. **China** has territorial and seabed resource disputes with **Japan** in the East China Sea and similar disputes with **Vietnam**, the **Philippines**, **Brunei**, **Indonesia**, and **Malaysia** in the South China Sea.

The historical missions of the **PLAN** initially focused in 1982 on “*resist invasions and defend the homeland*”. In 1985, **Deng Xiaoping** introduced the “*offshore active defense*” strategy. This strategy encompasses areas that **China** claims are under its legitimate jurisdiction. Admiral **Liu Huaqing** defined these areas as the first island chain that stretches from the Kurile Islands through the islands of **Japan**, the Ryukyu Archipelago, Taiwan, the **Philippines** to Borneo Island, the Yellow Sea, East China Sea, and the South China Sea. The shift toward meaningful naval modernization began with former President **Jiang Zemin**’s active defense guidelines in 1993. The **PLAN**’s mission evolved to “*safeguard the sovereignty of China’s national territorial land, air, and seas*” and “*uphold China’s unity and security.*” Under this policy, the **PLAN** focused on developing capabilities for sea denial operations beyond Taiwan and safeguarding coastal economic centers. Under President **Jiang Zemin**’s guidelines, the **PLAN** started enhancing its offensive capabilities for limited sea control operations, notably in its goal of asserting sovereignty and territorial claims in the East and South China Seas<sup>8</sup>. In 2004, President **Hu Jintao** outlined the “*New Historic Missions*”<sup>9</sup> of the **PLA**. These include consolidating the ruling status of the Communist Party, ensuring **China**’s sovereignty and territorial integrity, safeguarding its expanding national interests, and contributing to world peace<sup>10</sup>. The role of the **PLAN** has gradually expanded according to the 2006, 2008, 2010<sup>11</sup>, and 2013 Defense White Papers.

### 1. The 2006 Defense White Paper

The 2006 National Defense White Paper notes that **China** should enhance its combat capabilities and participate in Military Operations Other Than War (MOOTW) that encompass

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<sup>8</sup> Cortez A. Cooper, “*The PLA Navy’s “New Historic Missions”*”, RAND Corporation, June 2009, [https://www.rand.org/content/dam/rand/pubs/testimonies/2009/RAND\\_CT332.pdf](https://www.rand.org/content/dam/rand/pubs/testimonies/2009/RAND_CT332.pdf)

<sup>9</sup> Michael S. Chase & Kristen Gunness, “*The PLA’s Multiple Military Tasks: Prioritizing Combat Operations and Developing MOOTW Capabilities*”, The Jamestown Foundation, 21 January 2010, <https://jamestown.org/program/the-plas-multiple-military-tasks-prioritizing-combat-operations-and-developing-mootw-capabilities/>

<sup>10</sup> Christopher H. Sharman, “*China Moves Out: Stepping Stones Toward a New Maritime Strategy*”, Institute for National Strategic Studies, 21–22 November 2014, <https://www.files.ethz.ch/isn/191534/ChinaPerspectives-9.pdf>

<sup>11</sup> “*China’s National Defense in 2010*”, Information Office of the State Council, The People’s Republic of China, 31 March 2011, [https://english.www.gov.cn/archive/white\\_paper/2014/09/09/content\\_281474986284525.htm](https://english.www.gov.cn/archive/white_paper/2014/09/09/content_281474986284525.htm)

counter-terrorism, U.N. Peacekeeping Operations, disaster relief, humanitarian assistance, and counter-piracy patrols. The 2008 Defense White Paper highlights that containment by outside powers is a threat and names the U.S. as exerting a negative influence in the Asia-Pacific region. It notes that the PLAN should expand its operational range and mission flexibility and become increasingly involved in international security<sup>12</sup>.

## 2. The 2010 Defense White Paper

China's National Defense 2010 white paper<sup>13</sup> provides an overview of China's defense policy. According to the white paper, the PLAN is a vital component of China's national defense as it is tasked with safeguarding China's sovereignty, security, and defending the country's maritime rights and interests in the Asia-Pacific region. The PLAN modernization efforts have been aimed at enhancing the PLAN's capabilities and, therefore, expanding its missions to missions such as counter-terrorism, disaster relief, and international peacekeeping operations. According to the white paper, the PLAN also engages in international naval cooperation, conducting joint exercises and training with other countries.

## 3. The 2013 Defense White Paper

The 2013 white paper titled "*The Diversified Employment of China's Armed Forces*" provided an overview of China's military strategy and the role of its armed forces in safeguarding national security and international security cooperation. According to the 2013 paper, China is committed to a defensive national defense policy focused on safeguarding national sovereignty, territorial integrity, security, and development interests. The PLAN is responsible for safeguarding China's maritime sovereignty, rights, and interests. These include territorial waters, contiguous zones, and exclusive economic zones (EEZs). Another essential mission of the PLAN is conducting patrols, escort missions, and surveillance in critical sea lanes and strategic maritime areas. The PLAN will also continue to be involved in international cooperation through disaster relief, humanitarian assistance, and United Nation's peacekeeping operations. The PLAN also engages in international security cooperation through joint exercises, training, and exchanges with foreign navies. The key takeaway of this white paper is that the PLAN will continue its modernization to become a world-class navy that can compete with major naval powers.<sup>14</sup>

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<sup>12</sup> "A Modern Navy with Chinese Characteristics", Office of Naval Intelligence, August 2009, <https://irp.fas.org/agency/oni/pla-navy.pdf>

<sup>13</sup> "China's National Defense in 2010", Information Office of the State Council, The People's Republic of China, 31 March 2011, [https://english.www.gov.cn/archive/white\\_paper/2014/09/09/content\\_281474986284525.htm](https://english.www.gov.cn/archive/white_paper/2014/09/09/content_281474986284525.htm)

<sup>14</sup> "*The Diversified Employment of China's Armed Forces*", The State Council Information Office of the People's Republic of China, April 2013, <http://eng.mod.gov.cn/xb/Publications/WhitePapers/4887929.html>



#### 4. The 2015 Defense White Paper

**China's** 2015 defense white paper<sup>15</sup> marks a significant shift in its military strategy. It emphasizes the importance of the maritime domain and the need to continue the **PLAN** modernization effort. **China** recognized that the most pressing threats would come from offshore areas. It anticipates that potential future conflicts would likely occur in the open sea, abandoning the traditional view that land defense is more important than the sea. It insists on the need for the **PLAN** to shift from “*offshore waters defense*” to a combination of “*offshore waters defense*” and “*open seas protection*.”<sup>16</sup> **China** needs a modern and versatile navy to safeguard national sovereignty, maritime rights, and interests and ensure security for its strategic sea lines of communication and overseas interests<sup>17</sup>.

At the time of the 2018 report<sup>18</sup> on China's Naval Modernization, the **PLAN** roles and missions included potential military action towards Taiwan, asserting and defending territorial claims in the South China Sea and East China Sea, enforcing its unique perspective on having the right to regulate foreign military activities within its 200-mile maritime exclusive economic zone (EEZ). The modernization efforts also focus on defending crucial commercial lines, reducing the **U.S.**'s influence in the Western Pacific, and asserting its status as a leading regional and major global power.

#### 5. The 2019 Defense White Paper

The 2019 White Paper<sup>19</sup> noted that the **PLAN** was accelerating its shift toward “*Far Seas Protection*” but was still behind in terms of military modernization. **China** aims to have a naval force capable of deploying ships for various missions anywhere on the high seas. Most of the **PLAN's** far seas operations were in the northern Indian and western Pacific oceans beyond the first island chain. The first chain refers to the band from **Russia's** Kuril Islands south to Borneo. The second includes **Papua New Guinea**, the Marianas, and the Caroline Islands. The **PLAN** has nonetheless demonstrated the ability to deploy ships in most of the world's major oceans. The 2019 White Paper also stressed the need for the **PLAN** to protect its “*overseas interests*,” including through “*developing overseas logistical facilities*” similar to the military base that was opened in 2017 in **Djibouti**.

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<sup>15</sup> “*China's Military Strategy*”, The State Council Information Office of the People's Republic of China, 27 May 2015, [https://english.www.gov.cn/archive/white\\_paper/2015/05/27/content\\_281475115610833.htm](https://english.www.gov.cn/archive/white_paper/2015/05/27/content_281475115610833.htm)

<sup>16</sup> Caitlin Campbell, “*Highlights from China's New Defense White Paper, “China's Military Strategy”*”, U.S.-China Economic and Security Review Commission, 01 June 2015, [https://www.uscc.gov/sites/default/files/Research/Issue%20Brief\\_Highlights%20from%20Chinas%20New%20Defense%20White%20Paper\\_Campbell\\_6.1.15.pdf](https://www.uscc.gov/sites/default/files/Research/Issue%20Brief_Highlights%20from%20Chinas%20New%20Defense%20White%20Paper_Campbell_6.1.15.pdf)

<sup>17</sup> “*China Naval Modernization: Implications for U.S. Navy Capabilities*”, Congressional Research Service, 01 August 2018, [https://www.everycrsreport.com/files/20180801\\_RL33153\\_1036f8edb5271519e9bd80690adce95f6e5bcbcb6.pdf](https://www.everycrsreport.com/files/20180801_RL33153_1036f8edb5271519e9bd80690adce95f6e5bcbcb6.pdf)

<sup>18</sup> *Ibid.*

<sup>19</sup> “*China's National Defense in the New Era*”, The State Council Information Office of the People's Republic of China, July 2019, <http://eng.mod.gov.cn/xb/Publications/WhitePapers/4846452.html>

## II. THE PLAN'S AIRCRAFT CARRIERS

Since the 1970s, **China's People's Liberation Army Navy (PLAN)** has harbored ambitions to develop aircraft carriers. Admiral **Liu Huaqing**, who studied under Soviet naval strategist Admiral **Sergei Gorshkov**, advocated for the development of an aircraft carrier program. In the 1980s, a feasibility study on carrier design and construction was conducted, and a training course for aircraft carrier commanders was even established. Admiral **Liu Huaqing** persisted in advocating for the program, but the idea did not gain support within the **PLA** hierarchy. Indeed, at the beginning of the 1980s, the focus was on the possible land threat from the **USSR**, and carrier development was not a top priority<sup>20</sup>.

In 1985, **China** acquired, for \$1.4 billion, the HMAS Melbourne, a Majestic-class aircraft carrier, from **Australia**<sup>21</sup>. The World War II-era aircraft carrier had been in service with the **Royal Australian Navy** from 1955 to 1982. The purchase, initially for scrap, provided valuable insights for the **PLAN** carrier research and development (R&D) program. Chinese naval architects studied the carrier's design during dismantling, focusing on equipment like catapults, arrestor wires, and aircraft lifts/elevators. The flight deck was also dismantled and transported ashore for pilot training in carrier take-offs and landings. Despite the **PLAN's** claims of opportunism, the acquisition appears to have been planned, contributing valuable insights for the development of **China's** indigenous aircraft carriers<sup>22</sup>.

The idea of locally designing and building an aircraft carrier can be traced back to the 1990s. **Yang Shangkun**, President of the **People's Republic of China** from 1988 to 1993, instructed the General Staff Department of the **Central Military Commission (CMC)** to procure an aircraft carrier and make it functional by 1997. In 1993, the **PLAN** leadership announced that they were launching research and development plans. In 1995, **China** decided that its goal was to build two aircraft carriers over the next decade. This period was marked by an increased interest in carrier technology from **China**, which was ramping up its influence in the South China Sea. In 1995, Chinese entities approached Spanish shipbuilder **Empresa Nacional Bazan**, who was constructing an aircraft carrier for the **Royal Thai Navy**. The company proposed building a low-cost, lightweight conventional take-off and landing (CTOL) carrier for **China**. Two designs were submitted, costing between \$350 to \$400 million. **China** expressed little interest in ordering the actual vessel but showed a greater interest in obtaining blueprints. The same year, **France**, which decommissioned the Clemenceau aircraft carrier, reportedly offered the ship to **China** for free. The **European Union's** weapons embargo on

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<sup>20</sup> Andrew Scobell, Michael McMahon & Cortez A. Cooper III, "China's Aircraft Carrier Program: Drivers, Developments, Implications", *Naval War College Review*: Vol. 68: No. 4, Article 7. 2015, <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1267&context=nwc-review>

<sup>21</sup> Ian Storey and You Ji, "China's Aircraft Carrier Ambitions, Seeking Truth from Rumors", *Naval War College Review*, Winter 2004, Vol. LVII, No.1, <https://web.archive.org/web/20100614023207/http://www.usnwc.edu/getattachment/ffc60b3e-d2e6-4142-9b71-6dfa247051f2/China-s-Aircraft-Carrier-Ambitions--Seeking-Truth->

<sup>22</sup> Dave Majumdar, "China's Next Aircraft Carrier: Everything We Know (So Far)", 31 March 2017, <https://nationalinterest.org/blog/the-buzz/chinas-next-aircraft-carrier-everything-we-know-so-far-19965>

**China** prevented the completion of such proposals<sup>23</sup>. By the end of the 1990s, **CMC** chair **Jiang Zemin** gave the **PLAN** the green light to begin designing an aircraft carrier.

### 1. From the Varyag to the Liaoning

In the early 1980s, the **Soviet Union** began constructing two Admiral Kuznetsov-class carriers. When the **Soviet Union** collapsed in 1991, the Varyag, one of those two carriers, was only 68% complete<sup>24</sup>. In 1992, after the fall of the **Soviet Union**, construction was halted, and the unfinished carrier was transferred to **Ukraine**. The Varyag was structurally complete but without electronics, a rudder, and most operating systems. In 1998, only the hull remained floating on water, pending a decision on what to do with it<sup>25</sup>. **Ukraine** decided to sell the Varyag to **Agencia Turistica E Diversões Chong Lot Limitada**, a company from **Macau**, for \$20 million, which was to convert it into a \$200 million floating hotel and casino. Authorities in Macau had warned the company that the Varyag would not be permitted to enter the harbor and denied the application to operate a casino, but the sale was carried out anyway. In reality, **Agencia Turistica E Diversões Chong Lot Limitada** was owned by a **Hong Kong** firm called **Chin Luck (Holdings) Company**. Most of the board members lived in Yantai, **China**, where a major Chinese navy shipyard is located. The chairman was also a former career military officer with the **People's Liberation Army (PLA)**. In 2000, tug boats were hired to tow the Varyag; however, **Turkey** refused to let it transit through the Bosphorus Strait. **Turkey** permitted passage after a year-and-a-half of negotiations with **China**, which offered trade concessions. The ship, which was supposed to be destined for a casino in **Macau**, arrived in 2002 at the Dalian Shipyard in **China**. The total cost was estimated to be at least \$120 million. In June 2005, the Varyag was moved to a dry dock in Dalian for refurbishment, including sandblasting the hull, erecting scaffolding, and treating metal corrosion. The ship was renamed the Liaoning, and offensive weapons and short-range defensive systems such as HHQ-10 air defense missile launchers, 30 mm close-in weapon systems, and anti-submarine rocket launchers were added<sup>26</sup>. Various radars, such as the **Type 348** active electronically scanned array (AESA) and Sea Eagle, were also installed<sup>27</sup>.

Contrary to initial reports, four oil-fired engines were still in the ship when it was bought. They were restored to working order in 2011, and it is estimated that the Liaoning has a top speed of around 20 knots. In 2012 the aircraft carrier was handed over to the **PLAN** to be commissioned. The Liaoning has a displacement of 66,000 tons, making it about 40% smaller than the U.S. Nimitz-class carrier USS Ronald Reagan. It is still superior in size compared to

<sup>23</sup> Ian Storey and You Ji, "China's Aircraft Carrier Ambitions, Seeking Truth from Rumors", Naval War College Review, Winter 2004, Vol. LVII, No.1, <https://web.archive.org/web/20100614023207/http://www.usnwc.edu/getattachment/ffc60b3e-d2e6-4142-9b71-6dfa247051f2/China-s-Aircraft-Carrier-Ambitions--Seeking-Truth->

<sup>24</sup> Kyle Mizokami, "A Dramatic Before-and-After Look at China's First Aircraft Carrier", Popular Mechanics, 03 January 2020, <https://www.popularmechanics.com/military/navy-ships/a30392809/liaoning-before-and-after/>

<sup>25</sup> N C Bipindra, "How deceit was built into China's first aircraft carrier" The Economic Times, 06 July 2021, [https://economictimes.indiatimes.com/news/defence/how-deceit-was-built-into-chinas-first-aircraft-carrier/articleshow/84111960.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](https://economictimes.indiatimes.com/news/defence/how-deceit-was-built-into-chinas-first-aircraft-carrier/articleshow/84111960.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)

<sup>26</sup> "Liaoning" Military Today, <https://www.militarytoday.com/navy/liaoning.htm>

<sup>27</sup> "Chinese aircraft carrier Liaoning" Wikipedia, [https://en.wikipedia.org/wiki/Chinese\\_aircraft\\_carrier\\_Liaoning](https://en.wikipedia.org/wiki/Chinese_aircraft_carrier_Liaoning)

the Japanese helicopter destroyer Izumo and the Indian carrier Vikramaditya<sup>28</sup>. It can operate up to 50 **J-15** fighter aircraft and helicopters. However, it lacks catapults, limiting its strike capabilities. It was mainly used as a training ship to allow the **PLAN** to experiment, train, and gain familiarity with aircraft carrier operations. In 2018, the Liaoning underwent its first update since it was commissioned, and a new island command center was installed. Following these upgrades, the ship shifted to a combat role in 2019.

Even though the Liaoning was **China's** most ambitious naval project at the time, the need for a more capable carrier was evident to establish a credible carrier aviation capability. In 2013, Major **General Yin Zhuo** highlighted in an interview that **China** was planning to expand its aircraft carrier program and acknowledged the need to bridge the technological and generation gap with the **U.S.** in military technology<sup>29</sup>.

## 2. The Shandong

The second aircraft carrier of the **PLAN**, known as the Shandong<sup>30</sup>, began its construction in November 2013, with the keel laid down in March 2015. The **Dalian Shipbuilding Industry Company (DSIC)** was in charge of the building and manufacturing. Its structure was based on an overall design and configuration similar to the Liaoning. It is slightly larger, has a smaller island providing additional deck space, its flight deck is 305 m long and 72 m wide, and it displaces around 66,000–70,000 fully loaded<sup>31</sup>. It is powered by conventional oil-fired boilers with eight steam turbines. The Liaoning can accommodate up to 44 aircraft, including 32 J-15s (air superiority fighters), 6 **Z-18Fs** (anti-submarine and anti-ship helicopters), 4 **Z-18Js** (airborne early warning helicopters), and 2 **Z-9Cs** (utility helicopters). Its main armament is the **HHQ-10** Surface-to-Air Missile (SAM) system. It is equipped with the Type 1130 30 mm Close-In Weapon System (CIWS) for close-in defense<sup>32</sup>. The Chinese government publicly confirmed its existence in December 2015. The Shandong was commissioned into the **PLAN** in 2019 after undergoing nine sea trials over 18 months. It achieved initial operating capability in October 2020, reaching basic standards for deployment. **China** became part of the small group of five nations with more than one aircraft carrier<sup>33</sup>.

<sup>28</sup> China Power Team, “How Does China’s First Aircraft Carrier Stack Up?”, Center for Strategic and International Studies (CSIS), December 9, 2015, Updated August 26, 2020, <https://chinapower.csis.org/aircraft-carrier/>

<sup>29</sup> “China’s first aircraft carrier enters service”, People’s Daily Online, 18 October 2013, <http://en.people.cn/90786/8429544.html>

<sup>30</sup> “Chinese aircraft carrier Shandong”, Wikipedia, [https://en.wikipedia.org/wiki/Chinese\\_aircraft\\_carrier\\_Shandong](https://en.wikipedia.org/wiki/Chinese_aircraft_carrier_Shandong)

<sup>31</sup> China Power Team, “What Do We Know (so far) about China’s Second Aircraft Carrier?”, China Power - Center for Strategic and International Studies (CSIS). 22 April 2017, Updated 15 June 2021, <https://chinapower.csis.org/china-aircraft-carrier-type-001a/>

<sup>32</sup> “Shandong”, Military Today, [https://www.militarytoday.com/navy/type\\_001a.htm](https://www.militarytoday.com/navy/type_001a.htm)

<sup>33</sup> Rick Joe, “003 and More: An Update on China’s Aircraft Carriers”, The Diplomat, 29 September 2020, <https://thediplomat.com/2020/09/003-and-more-an-update-on-chinas-aircraft-carriers/>

### 3. The Fujian

The Liaoning and the Shandong laid the groundwork for the development of a more advanced aircraft carrier. Construction on the Fujian began at Shanghai's **Jiangnan Shipyard** sometime between 2015 and 2017, was launched in 2022, and it should enter service with the **PLAN** around 2024-2025<sup>34</sup>. With a displacement of around 80,000 tonnes, the Fujian is significantly larger than previous Chinese aircraft carriers and is part of **China's** ambition to enhance its naval power projection capabilities. It is comparable in size to the **U.S. Navy's** Nimitz and Ford aircraft carriers. It represents a significant leap in **China's** naval capabilities. Unlike its predecessors, the Fujian will feature Electromagnetic Aircraft Launch System (EMALS) catapults. This technology, which uses electricity instead of traditional steam, offers advantages such as space efficiency and a higher aircraft launch rate. On **China's** earlier aircraft carriers, fighter jets launched using their own power from a ramp. In contrast, the Fujian incorporates three EMALS catapults, symbolizing the PLAN's dedication to advancing its carrier technology and its ambition to compete globally in naval aviation capabilities. Despite its technological advancements, the Fujian maintains a conventional power system with its eight conventional oil-fired boilers, distinguishing it from nuclear-powered carriers like those in the **U.S. Navy** and **France's** Charles de Gaulle.<sup>35</sup> Its defensive armament comprises three 30 mm CIWS. The Fujian is operated by a crew of 2,000 sailors and 1,000 airmen and is expected to carry the **Shenyang J-15T** fighter and possibly the advanced **J-35** stealth fighter<sup>36</sup>, the naval version of the **Shenyang FC-31**. This development makes **China** the first country outside the **U.S.** to develop a domestically produced carrier-capable stealth fighter.

With three carriers, **China** is now in second spot in the world in terms of numbers and size<sup>37</sup>. This enhances its power projection capabilities, allowing for more frequent deployment of carrier battle groups and the potential to bring multiple groups to strategic situations. There are plans for a fourth aircraft carrier (Type-004) that would incorporate nuclear propulsion and an electromagnetic catapult system. These features could enhance the aircraft carrier's power projection capabilities, allowing it to launch various aircraft, including larger and more heavily armed planes. Specific details, including the timeline for construction and commissioning, remain unclear<sup>38</sup>.

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<sup>34</sup> "Fujian", Military Today, <https://www.militarytoday.com/navy/fujian.htm>

<sup>35</sup> China Power Team, "How Advanced Is China's Third Aircraft Carrier?", China Power - Center for Strategic and International Studies (CSIS), May 17, 2023, Updated May 3, 2024, <https://chinapower.csis.org/china-type-003-fujian-aircraft-carrier/>

<sup>36</sup> David Cenciotti, "China's New Carrier-Based Stealth Fighter Makes First Flight", The Aviationist, 29 October 2021, <https://theaviationist.com/2021/10/29/j-35-first-flight/>

<sup>37</sup> H I Sutton, "China Launches First Aircraft Carrier Which Rivals U.S. Navy's", Naval News, 17 Jun 2022, <https://www.navalnews.com/naval-news/2022/06/china-launches-first-aircraft-carrier-which-rivals-u-s-navys/>

<sup>38</sup> Peter Suci, "Is China Really Building a Nuclear-Powered Aircraft Carrier?", The National Interest, 21 November 2023 <https://nationalinterest.org/blog/buzz/china-really-building-nuclear-powered-aircraft-carrier-207397>

### III. THE PLAN'S CONVENTIONALLY POWERED SUBMARINES

The **PLAN**'s first submarine was a non-operational **M Class** which was gifted to **China** in July 1953 by the **Soviet Union**. **China** received an additional eight S-1 and M-V Class submarines from the **Soviet Union** between 1954 and 1955. Between 1954 and 1958, the **Soviet Union** supplied **China** with 21 of Project 613, the most conventional modern attack submarine in its inventory<sup>39</sup>. Around the same time, the **Soviet Union** also decided to supply the license to build the **O3-class** (NATO: Whiskey). By the time the Soviets stopped their assistance in August 1960, the **PLAN** had about 12 submarines directly transferred from the **USSR** and 19 **Type 03** (Whiskey Class) submarines assembled in Chinese shipyards<sup>40</sup>. The “Whiskey” class submarine displaced 1,350 tons submerged and had a range of 13,500 nautical miles.

#### 1. Type 033

After the **Type 03** “Whiskey,” **China** started producing the **Type 033** “Romeo”. Under the 1950 Sino-Soviet Friendship and Mutual Assistance Treaty, the country had received blueprints and documentation from the **Soviet Union** to produce these submarines<sup>41</sup>. Production of the **Type 6633** the early versions of the **Type 33** were assembled from kits provided by the **Soviet Union**. The production of this first version was cut short when the diplomatic situation with the **USSR** degraded, and parts were no longer delivered. Only two ended up being completed, and a 3rd unit lay incomplete. **Type 6633** was already a Chinese-produced submarine that used locally crafted extra parts, especially batteries. The two submarines were introduced in the **PLAN** in 1964. The **Type 033** “Romeo” underwent various improvements over the original Soviet design. The domestic production of the first Chinese variant (**Type 033**) was achieved in 1967. The submarines underwent a refit for tropical climates to address refrigeration and air conditioning issues. **Type ES5A** was introduced in the late 1970s with upgraded electronics and guidance systems and improved periscopes, ranging sonar, communication systems, and reconnaissance sonar. It led to further improvement with **Type 033G**, which could launch acoustic homing torpedoes. All **Type 33s** were converted to this standard. A modified **Type 033G**, the **Type 033G1** carried anti-ship missiles and had improved surfacing capabilities. The **ES5B** was the last type of Chinese Romeo-class submarine. It was derived from **Type 033G** and intended for export. It featured a wire-guided torpedo launching system, an anti-ship missile launching system, and noise reduction of 20 dB. Between 1962 and 1984, **China** built 84 **Type 033** attack submarines.

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<sup>39</sup> “Type 03 Class Submarines”, Naval Encyclopedia, <https://naval-encyclopedia.com/cold-war/china/type-03-class-submarines.php>

<sup>40</sup> Bates Gill and Taeho Kim, “China’s Arms Acquisitions from Abroad - A Quest for ‘Superb and Secret Weapons’”, SIPRI Research Report No. 11, OXFORD UNIVERSITY PRESS, 1995, <https://www.sipri.org/sites/default/files/files/RR/SIPRIRR11.pdf>

<sup>41</sup> “Romeo-class submarine”, Wikipedia, [https://en.wikipedia.org/wiki/Romeo-class\\_submarine](https://en.wikipedia.org/wiki/Romeo-class_submarine)

## 2. Type 035

Following the end of the partnership with the **Soviet Union**, **China** charged the **Wuhan Ship Development and Design Institute** to start working on an improved version of the **Type 033**. In 1969, the Wuchang Shipyard and Jiangnan Shipyard began the construction of the **Type 035**<sup>42</sup> prototype. The first two **Type 035** were delivered in 1974, and a total of 84 of those submarines were produced by 2019. The **Type 035** (Ming class) diesel-electric submarine is a significant improvement over the **Type 033** submarines and has undergone various upgrades to enhance its capabilities. It is considered to be China's first fully indigenous submarine. The substantial modifications included improved propulsion and a reinforced hull that gave it the ability to surpass the 300-meter depth threshold. Its two diesel engines gave it a 5,200 horsepower, enabling a submerged speed of 18 knots. The submarines were equipped with eight torpedo tubes for anti-ship or anti-submarine torpedoes and could carry 28 mines. In the early 1980s, the **Type 035A**, an improved version, was introduced. It entered service in 1982, with three more commissioned by 1990. Starting in 1985, the **Type 035G**, an upgraded version, marked a new wave of modifications that introduced anti-submarine capabilities and the ability to launch acoustic homing torpedoes<sup>43</sup>. It was equipped with the **Yu-3** torpedo, a domestic acoustic homing torpedo, anti-ship missiles, and the French DUUX-5 sonar. Twelve **Type 035Gs** were built between 1990 and 1999. The last version commissioned between 2000 and 2003 was **Type 035B**, which was capable of launching land attack cruise missiles from torpedo tubes. The **Type 35**-class submarines were gradually retired.

## 3. Type 039

The **Type 039**<sup>44</sup> submarine, also known as the Song class, is a diesel-electric submarine developed by Wuhan Shipyard for the **PLAN**. It is the first diesel-electric submarine to be fully developed by China and was designed to replace the **Type 35** class. The **Type 039** is also the first Chinese diesel-electric submarine to use the modern teardrop hull shape. The keel of the first submarine of the class was laid down in 1991, and the first **Type 039** was launched in May 1994, and commissioned in June 1999<sup>45</sup>. **Type 039** was armed with **Yu-3** acoustic-homing anti-submarine or **Yu-4** passive acoustic-homing anti-ship torpedos with a range of 6 km. It could also carry 24 to 36 naval mines and the **YJ-8** anti-ship missiles with a range of up to 80 km. The hull was covered with rubber tiles for sound absorption, and it had a seven-blade propeller with an engine mounted on a shock-absorbing base.

**Type 039G**, a modified version that addressed acoustic signature and underwater performance issues, was launched in November 1999 and commissioned in April 2001. Additional **Type 039G** submarines entered service in December 2001 and November 2003, respectively.

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<sup>42</sup> Dreadnaughtz, "Type 035 (Ming class) submarines (1973)", Naval Encyclopedia, 19 May 2019, <https://naval-encyclopedia.com/cold-war/china/ming-class-attack-submarines-type035.php>

<sup>43</sup> "Type 035 submarine", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_035\\_submarine](https://en.wikipedia.org/wiki/Type_035_submarine)

<sup>44</sup> "Type 039 submarine", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_039\\_submarine](https://en.wikipedia.org/wiki/Type_039_submarine)

<sup>45</sup> "Type 39 / Song Class Attack Submarine", Naval Technology, 15 April 2010, <https://www.naval-technology.com/projects/songclasssubmarine/?cf-view>

#### 4. Type 039A

An improved version of the **Type 039** submarine, the **Type 039A**<sup>46</sup>, was developed to replace the **Type 033** and the **Type 035** submarines. Commissioned by the **PLAN** in 2006, this diesel-electric submarine represented a leap forward in underwater warfare technology as it was one of the quietest in its class. The design is similar to the Kilo-class submarines that **China** bought from **Russia** after the collapse of the **Soviet Union**. The teardrop-shaped hull emphasized enhanced underwater combat capabilities with a strategic focus on stealth and operational versatility. Its hull also provided increased internal space for equipment and crew comfort<sup>47</sup>. Rubber anti-sonar anechoic tiles further diminished the risk of acoustic detection.

The **Type 039A** featured a diverse weaponry profile, armed with six 533 mm torpedo tubes capable of launching indigenous torpedoes like the **Yu-6** as well as Russian-made torpedoes. Its potential inclusion of the supersonic **YJ-18** anti-ship missile and its capability to launch **YJ-8X** series anti-ship missiles that carry a 165 kg semi-armor-piercing high-explosive warhead at a range of 80–120 km and speed of Mach 0.9 underscored its offensive capabilities. The **Type 039A** also had the possibility of firing the **CY-1** anti-submarine warfare missile at a range of 18 km.

#### 5. Type 039B

In 2013, the **Type 039B** submarine, an improved version of the **Type 039A**, was launched. In 2017, **China** resumed the construction of the **Type 039B**<sup>48</sup> after a three-year hiatus<sup>49</sup>. The **Type 039B** featured significant improvements and upgrades. Its design included a longer hull, improved acoustic reduction, a multi-spectrum photonics mast, an optimized conning tower, and enhanced combat capabilities. The design changes in the hull reduced underwater resistance, improving speed and minimizing noise. At the time, it was the quietest submarine class in the **PLAN** inventory. The **Type 039B** submarines were also equipped with a side-inclined propeller for noise reduction, diesel-electric engines, and air-independent propulsion (AIP) technology. The upgraded Stirling engine enhanced power and reliability, and the AIP system improved underwater combat and noise performance. These improvements allowed them to stay submerged for several weeks without surfacing. Its enhanced combat capabilities included **Fish-6** torpedoes<sup>50</sup> and a vertical launch system for newer anti-ship cruise missiles.

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<sup>46</sup> “Type 039A submarine”, Wikipedia, [https://en.wikipedia.org/wiki/Type\\_039A\\_submarine](https://en.wikipedia.org/wiki/Type_039A_submarine)

<sup>47</sup> “Yuan Type 039A”, GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/yuan.htm>

<sup>48</sup> “Yuan Type 039B SSP”, GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/type-039b.htm>

<sup>49</sup> Franz-Stefan Gady, “China Resumes Production of Its ‘Quietest’ Attack Submarine”, The Diplomat, 06 January 2017, <https://thediplomat.com/2017/01/china-resumes-production-of-its-quietest-attack-submarine/>

<sup>50</sup> “Chinese Type 039B submarine conducts maritime combat training”, Navy Recognition, 18 August 2022, <https://www.navyrecognition.com/index.php/naval-news/naval-news-archive/2022/august/12079-chinese-type-039b-submarine-conducts-maritime-combat-training.html>



## 6. Type 039C

In May 2021<sup>51</sup>, the latest variant of the **Type 039** was spotted through satellite imagery. The **PLAN** acknowledged its existence at an unveiling ceremony attended by state media almost another year later<sup>52</sup>. This new variant is expected to be fully operational by the end of the decade. The **Type 039C** introduces an angled sail design and a modified hull. The sail's unique shape, which potentially enhances surface operations and stealth, is a departure from earlier designs in the Yuan-class. The angled design of the sail is intended to help counter medium-frequency sonar<sup>53</sup>. This sail design is part of a broader trend in naval warfare, with similarities found in **Sweden's A-26** class and **Germany's** upcoming **Type 212CD** submarines. The modified hull, combined with the sound-absorbing rubber coating on the submarine's exterior and a redesigned conning tower, improves hydrodynamics and reduces acoustic signatures and noise emissions. These improvements may prove sufficient to enhance its overall stealth capabilities. The inclusion of an air-independent propulsion system further extends the submarine's submerged endurance. The **Type 039C** is likely armed with torpedoes, the **YJ-18B** supersonic land-attack cruise missiles, and **YJ-82** anti-ship cruise missiles. This latest variant of diesel-electric submarines showcases **China's** rapid progress in naval technology.

## 7. Type 032

In 2012, **China** publicly displayed its **Type 032** Qing-class submarine. With 92.6 meters long, a height of 17.2 meters, a surfaced displacement of 3,797 tons, and a submerged displacement of 6,628 tons, it was the world's largest diesel-electric submarine. The **Type 032** resembled an enlarged **Type 039A** and could carry about 50 special forces personnel for short-range operations and deploy unmanned underwater vehicles<sup>54</sup>. The **Type 039A** also featured an escape pod for enhanced survivability of the crew during emergencies.

It was used mainly for various weapons, including **JL-2A** submarine-launched ballistic missiles, **CJ-20A** cruise missiles, and **YJ-18** anti-ship missiles<sup>55</sup>. The **Type 039A** also conducted the first three test launches of the **JL-3** starting in 2018.<sup>56</sup>

In 1994, **China** purchased four Russian Kilo-class diesel submarines and two additional upgraded variants in 1996. In June 2002, **China** negotiated with **Russia** to purchase eight

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<sup>51</sup> Aadil Brar "Video Catches Rare Glimpse of China's Silent Killer Submarine", Newsweek. 21 December 2023, <https://www.newsweek.com/china-submarine-type-039c-ocean-surface-video-1854487>

<sup>52</sup> "Chinese Type 039C submarine secretly entered service". Navy Recognition, 19 July 2022, <https://www.navyrecognition.com/index.php/naval-news/naval-news-archive/2022/july/11947-chinese-type-039c-submarine-secretly-entered-service.html>

<sup>53</sup> Aadil Brar, "China's New Stealth Submarines Will Be Even Harder To Find, Analyst Says", Newsweek, 29 November 2023, <https://www.newsweek.com/china-submarine-hard-find-new-1847946>

<sup>54</sup> Sebastien Roblin "Meet the Qing-Class: China's Homegrown Nuclear Missile Submarine", The National Interest, 03 November 2019, <https://nationalinterest.org/blog/buzz/meet-qing-class-chinas-homegrown-nuclear-missile-submarine-92341>

<sup>55</sup> "Great Wall No. 201 / Type 032 Qing-class test submarine", GlobalSecurity.org, <https://www.globalsecurity.org/wmd/world/china/type-032.htm>

<sup>56</sup> "Qing-class submarine", Wikipedia, [https://en.wikipedia.org/wiki/Qing-class\\_submarine](https://en.wikipedia.org/wiki/Qing-class_submarine)

additional **Project 636** Kilo submarines equipped with the **Klub-S** anti-ship cruise missile system for \$1.6 billion<sup>57</sup>. By March 2006, **China** had nine Kilo submarines, including **Type 877** and the newer **Type 636** with quieter propulsion, and three more were on order. This 2002 deal was part of a \$4 billion weapons package committed by **Russia** to **China** over four to five years. This deal also included the technology for domestically built Kilo-class submarines. This acquisition provided the **PLAN** with access to sonar development and weapon systems technology, which served **China's** military modernization strategy. Some aspects were included in the Yuan-class submarine construction programs. Still, this proved that **China** was experiencing difficulties in its domestic submarine manufacturing program.

The diesel-powered **Project 636 Kilo**-class submarines were equipped with Klub long-range, anti-ship missile systems. The Kilo-class submarines are designed for anti-surface and anti-submarine warfare and are known for their reduced acoustic signatures. They have a crew of fifty-two and can be on patrol for up to forty-five days, reaching a maximum dive depth of 300 meters and a reported range of 12,000 kilometers<sup>58</sup>. The Kilo-class's small size allows them to operate effectively in shallow coastal waters, providing better maneuverability over larger nuclear submarines. The submarines have six torpedo tubes, anti-aircraft missiles, and advanced sonar systems.

## IV. THE PLAN'S NUCLEAR-POWERED SUBMARINES

### 1. Nuclear Attack Submarines (SSN)

#### a. Type 091

The Chinese naval nuclear power program began in July 1958 when Chairman **Mao Zedong** and the **Central Military Commission** approved the **Type 091** submarine project<sup>59</sup>. Nuclear propulsion was deemed a national priority by **Mao Zedong** himself. The Soviet Union refused to transfer any nuclear technology to **China** and withdrew all its atomic energy experts from 1960 to 1962. The project faced numerous challenges and interruptions due to the Great Leap Forward and the Cultural Revolution. These movements resulted in program delays, funding cuts, and the loss of talented engineers<sup>60</sup>. The program was temporarily suspended in 1962 but resumed in 1965. **China** could not support both its nuclear weapons program and the nuclear submarines program; therefore, research work progressed slowly.

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<sup>57</sup> John Pomfret, "China to Buy 8 More Russian Submarines", The Washington Post, 25 June 2002, <https://www.washingtonpost.com/archive/politics/2002/06/25/china-to-buy-8-more-russian-submarines/eaec2e3e-fe7a-47a4-ba29-ac42a18f60bb/>

<sup>58</sup> Caleb Larson, "China's Deadly Kilo-Class Submarines Are From Russia With Love", The National Interest, 11 May 2021, <https://nationalinterest.org/blog/reboot/chinas-deadly-kilo-class-submarines-are-russia-love-184940>

<sup>59</sup> "Type 091 Han-class Program", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/type-91-program.htm>

<sup>60</sup> <https://naval-encyclopedia.com/cold-war/china/type-091-han-class-nuclear-attack-submarines-1970.php>

The reactor type was formally approved in July 1965, technical designs were finalized in 1967, and construction drawings were completed in early 1969<sup>61</sup>. The first nuclear submarine was laid down in 1967 in the former **Bohai Shipyard**. Now called **Bohai Shipbuilding Heavy Industry Co., Ltd.**, the yard has been responsible for all Chinese nuclear-powered submarines ever since. Despite setbacks, a land-based reactor prototype utilizing pressurized water was successfully tested in 1970. The “Long March I” was officially launched in 1970 on **Mao Zedong**’s 77th birthday. Sea trials began in 1971, and it became operational in 1974. This submarine faced operational issues for a decade due to ongoing problems with its nuclear reactor, which limited its operational role. Five more of the same class were built between 1977 and 1990. **Type 091** Han class was a significant achievement for **China** as it became one of the few countries with nuclear-powered submarines. The first two **Type 091** submarines faced severe mechanical problems, such as corrosion leading to leaks in various components, radiation-related concerns affecting the crews, and poor-quality machinery in the primary propulsion system. The subsequent **Type 091** submarines were modified with an increased length to improve crew habitability and nuclear safety.

**Type 091** class submarines were powered by a 90-megawatt pressurized water reactor and a nuclear turbo-electric engine that provided a top speed of 25 knots (46 km/h). The **Type 091** submarines lacked torpedoes for many years, receiving them only in 1989. The submarines were then armed with six 533 mm bow torpedo tubes, capable of carrying torpedoes or mines, and had the ability to launch the **C-801 Ying-Ji** subsonic anti-ship cruise missile from the surface.

### b. Type 093

The next-generation **Type 093** Shang-class attack submarine was intended to replace the Han class. It was initiated in the mid-1980s and represented a significant leap forward from its predecessor. **Deng Xiaoping** believed that submarines were not priorities in **China**’s military modernization efforts as he considered the limited military capability of early nuclear submarines not worth their high cost. His lack of interest in nuclear submarines persisted until the late 1980s.

Construction on **Type 093** began in 1994, and the first units of the **Type 093** were launched in 2002 and 2003 and commissioned into service in 2006 and 2007. The new **Type 093** is a notable advancement over its predecessor, incorporating a blend of foreign and local technologies and showcasing advances in propeller technology. The new **Type 093** is notably thought to be similar to Russian designs, such as the **Victor III** submarine. The **Type 093** underwent extensive sea trials lasting 3.5 to 4 years before being. Despite expectations of **Victor III**-like performance, the submarines did not meet the desired speed and noise goals. In 2015-2016, one submarine received drag reduction alterations features to remedy the speed issue.

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<sup>61</sup> Christopher P. Carlson and Howard Wang, “China Maritime Report No. 30: A Brief Technical History of PLAN Nuclear Submarines”, CMSI China Maritime Reports. 30, 17 August 2023, <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1029&context=cmsi-maritime-reports>

### c. Type 093A

Building upon the foundation laid by the **Type 093**, **China** decided to develop the **Type 093A**, a significant evolution in submarine capabilities.<sup>62</sup> The **Type 093A** submarines incorporated more substantial streamlining to the sails to reduce drag. The **Type 093A** is still the **PLAN**'s most powerful nuclear attack submarine. With its 7,000 tons, it is roughly the same size as the **Royal Navy**'s Astute Class<sup>63</sup>. In size terms, it is between the French **Marine Nationale Suffren** Class and the **U.S. Navy**'s **Virginia** Class<sup>64</sup>. The submarines are designed with a focus on acoustic stealth; still, the quietness of the design is classified information. The **Type 093A** underscores **China**'s commitment to maritime dominance in the South China Sea, where it has sovereignty claims over the Spratly and Paracel Islands and where numerous shipping lanes pass. It is also a symbol of its growing naval capabilities. The early **Type 093** attack submarines were about 110 decibels. That is about the same as the **U.S. Navy**'s Los Angeles Class boats, which were built in 1982. Further, **Type 093** submarines had improvements in reactor coolant pump design and hull acoustic insulation, which may have helped reduce the acoustic signature.

### d. Type 093B

In May 2022, a satellite photo of a shipyard at Huludao in Liaoning province showed what could be a new class or subtype of a Chinese nuclear-powered attack submarine with a stealthy propulsion system and launch tube. Due to its size of 110-meter, it was believed to be a variant of the **Type 093** rather than an altogether new class. Between May 2022 and January 2023, **China** launched two **Type 093B** and could have three operational submarines of this class by 2025. If equipped with land-attack cruise missiles, they could increase the **PLAN**'s anti-surface warfare capability. In January 2023, **China** launched the eighth **Type 093 (Type 093B)** from the Huludao shipyard<sup>65</sup>.

The **Type 093A** and **Type 093B** submarines included a redesigned sail featuring a tapered front, rounded sail top, and a fillet at the base. Both types are equipped<sup>66</sup> with sophisticated radar and sonar systems, including surface search radar, radar warning receiver, direction-finder, improved H/SQG-207 flank-mounted sonar arrays, H/SQ2-262 bow-mounted sonar, and a towed array sonar. **Type 093A** and **Type 093B** armaments feature six 533mm bow-mounted torpedo tubes and a variety of anti-submarine and anti-surface torpedoes. The **Type 093B** can carry 20 torpedoes or 36 mines and is expected to carry the **YJ-18** anti-ship

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<sup>62</sup> "Type-093A Shang-class", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/type-93a.htm>

<sup>63</sup> H I Sutton, "The Chinese Navy's Most Powerful Attack Submarine: The Type-093A", Naval News, 15 November 2020, <https://www.navalnews.com/naval-news/2020/11/the-chinese-navys-most-powerful-attack-submarine-the-type-093a/>

<sup>64</sup> Peter Suciú "Watch Out: China's Type 093 Submarine Is No Joke", The National Interest, 29 October 2021 <https://nationalinterest.org/blog/reboot/watch-out-chinas-type-093-submarine-no-joke-195455>

<sup>65</sup> Christopher Biggers, "China launches second possible Type 093B hull", Janes, 01 February 2023, <https://www.janes.com/defence-news/news-detail/china-launches-second-possible-type-093b-hull>

<sup>66</sup> "Type 093 Shang-class Nuclear Attack Submarine", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/type-93.htm>

cruise missile. It can accommodate 100 crew members and is powered by a pressurized water nuclear reactor engine, reaching a maximum speed of 30 knots<sup>67</sup>.

### e. Type 095

According to the 2023 China Maritime Report No. 30: A Brief Technical History of PLAN Nuclear Submarines from the **U.S. Naval War College's China Maritime Studies Institute**<sup>68</sup>, **China** is now developing the **Type 095**, its third-generation nuclear attack submarine. The **Type 095** submarines are anticipated to be significantly larger than their second-generation counterparts due to incorporating a new reactor, a floating raft, and vertical launch systems. It is also expected to integrate advanced features such as a pump jet propulsor, a hybrid propulsion system, and 12 to 18 vertical launch system tubes able to accommodate anti-ship and land-attack cruise missiles<sup>69</sup>. The **Type 095** advanced nuclear reactor and overall design should be based on Russian submarines, notably **Project 971 Akula I**. The **Type 095** will also accommodate advanced sensors such as new active/passive flank array sonar and low- and high-frequency towed sonar array.

According to the **U.S. Office of Naval Intelligence**, the **PLAN** is transitioning from older, less reliable attack submarines to the more modern **Type 095**.<sup>70</sup> Nearly 50 years after its first nuclear attack submarine was commissioned, **China** is on the verge of developing world-class nuclear-powered submarines.

## 2. Chinese – Russian nuclear reactor deal

**China** has faced challenges in developing compact, high-power naval nuclear reactors. The original **Type 091** reactor vessel had a power rating of 48 MW. It was estimated that the **Type 093** would have a maximum power of 150 MW. Therefore, it was estimated that the **Type 093** would have to be equipped with two Chinese-made reactors, given the country's technological capabilities. In 2010, an agreement between **Rosatom** and the **China Atomic Energy Authority** gave **China** access to detailed technical information on Russian nuclear reactors used in floating nuclear power plants. These would be useful for the design of **China's** future reactors for the **Type 095** and **Type 096** nuclear submarines.

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<sup>67</sup> “Shang-Class Nuclear-Powered Attack Submarines, China”, Naval Technology, 17 February 2023, <https://www.naval-technology.com/projects/shang-class-nuclear-powered-attack-submarines-china/?cf-view>

<sup>68</sup> Christopher P. Carlson and Howard Wang, “China Maritime Report No. 30: A Brief Technical History of PLAN Nuclear Submarines”, China Maritime Studies Institute, U.S. Naval War College, 08 August 2023, <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1029&context=cmsi-maritime-reports>

<sup>69</sup> H I Sutton, “Chinese Navy Steps Closer To New Generation Of Nuclear Submarines”, Forbes, 19 June 2020, <https://www.forbes.com/sites/hisutton/2020/06/19/chinese-navy-gets-closer-to-new-generation-of-nuclear-submarines/?sh=7b506629229e>

<sup>70</sup> Caleb Larson, “China's Type 095 Submarine Is a Source of Worry for the U.S. Navy”, The National Interest, 11 November 2021 <https://nationalinterest.org/blog/reboot/china%E2%80%99s-type-095-submarine-source-worry-us-navy-196042>

### 3. Nuclear-Powered Ballistic Missile Submarines (SSBN)

#### a. Type 092

In 1971, nine months after the first **Type 091**, **China** started working on **Type 092**, its first-ever nuclear-powered ballistic missile submarine (SSBN)<sup>71</sup>. The submarine was launched in 1981 and commissioned in August 1983. The project faced numerous challenges and interruptions due to the Cultural Revolution. The **Type 092** Xia class was designed by **Peng Shilu** and **Huang Xuhua** and derived from **Type 091**. It had an extended hull to accommodate twelve nuclear ballistic missile tubes<sup>72</sup>. **Type 092**'s goal was to provide **China** with an effective nuclear retaliatory capability. In 1985, it conducted its first submerged missile test firings. All three failed in flight after their launch. **Type 092** was equipped starting in 1987 with the **JL-1**, **China**'s first nuclear submarine-launched Launched Ballistic Missile (SLBM), which had a range of just under 1,800 kilometers. The submarine, however, faced numerous challenges and limitations throughout its operational history. The **Type 092** had limited missile range and high sound emissions<sup>73</sup>. It was the loudest nuclear-powered ballistic missile submarine compared with those from **Russia** and the **U.S.** **Type 092** also faced operational challenges such as high noise levels, radiation leakage, and a limited range of the **JL-1** ballistic missile.

#### b. Type 094

In 1994, **China** officially started the development of the **Type 094**, its second-generation SSBN, to succeed the **Type 092**. The construction began in 1996, and the first **Type 094** was built in 1999 and completed in July 2004. By 2008, the **U.S. Department of Defense** confirmed it was in service, and it was deemed **China**'s "*first credible sea-based nuclear deterrent*."<sup>74</sup> The **Type 094** represents an improvement over **China**'s first SSBN, but it still had shortcomings, such as the noise level. It was considerably louder than American and Russian submarines, with an acoustic signature of 120 decibels.

According to the **U.S. Office of Naval Intelligence**, the **Type 094** was even noisier than the Soviet Union's **Delta III** SSBN, which was first launched in 1976.<sup>75</sup> According to the **U.S. Department of Defense**, a **Type 094A** variant appeared with improvements in shape and

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<sup>71</sup> Christopher P. Carlson and Howard Wang, "China Maritime Report No. 30: A Brief Technical History of PLAN Nuclear Submarines", China Maritime Studies Institute, U.S. Naval War College, 17 August 2023, <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1029&context=cmsi-maritime-reports>

<sup>72</sup> "Type 092 submarine", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_092\\_submarine](https://en.wikipedia.org/wiki/Type_092_submarine)

<sup>73</sup> Caleb Larson, "The Type 092: China's First Nuclear-Powered Ballistic Missile Submarine Made History", The National Interest, 03 May 2020, <https://nationalinterest.org/blog/buzz/type-092-china%E2%80%99s-first-nuclear-powered-ballistic-missile-submarine-made-history-150431>

<sup>74</sup> "Military and Security Developments Involving the People's Republic of China", United States Department of Defense, Annual Report to Congress, 2020, <https://media.defense.gov/2020/Sep/01/2002488689/-1/-1/1/2020-DOD-CHINA-MILITARY-POWER-REPORT-FINAL.PDF>

<sup>75</sup> Matthew P. Funaiolo, Joseph S. Bermudez Jr., and Brian Hart, "A Glimpse of Chinese Ballistic Missile Submarines", Center for Strategic and International Studies (CSIS), 04 August 2021, <https://www.csis.org/analysis/glimpse-chinese-ballistic-missile-submarines>

sail design in 2016<sup>76</sup> to address this issue and reduce the submarine's detectability. Despite these efforts, the noise signature remains a notable weakness.

### c. Type 096

**China** is actively working on the **Type 096**<sup>77</sup>, its next generation of SSBNs, which will be its most advanced nuclear submarine. **Type 096** will measure approximately 150 meters in length and 20 meters in width and have a maximum diving depth of 600 meters. The **Type 096** will have a displacement of about 16,000 tons and should achieve a maximum speed of 35 knots while submerged. It will probably have improved command, control, and communication systems, be capable of conducting combat operations in polar regions, and feature an anechoic coating with silencer tiles to reduce noise levels to less than 100 decibels. The **Type 096** submarine will be comparable to state-of-the-art Russian submarines regarding stealth, sensors, detection capabilities, and weapon systems.

The **Type 096** will be equipped with the **JL-3** SLBM and vertical launching cells capable of firing **YJ-83** subsonic anti-ship cruise missiles. It will close the gaps in **China's** strategic triad, providing a formidable sea-based nuclear deterrent and having profound security implications in the Indo-Pacific.

### d. Nuclear Deterrence

**China's** SSBN fleet serves as a deterrent to a potential nuclear first strike<sup>78</sup>. The development of **China's** submarine-launched ballistic missiles (SLBMs) has evolved over several decades. The initial **JL-1**, with a range of 2,700 kilometers, lacked effectiveness, leading to the development of the **JL-2**, which is estimated to have a range of about 7,200 kilometers. Each SSBN can carry up to twelve **JL-2** missiles.

The **JL-3**, **China's** third-generation SLBM, replaced the **JL-2** SLBM in the **Type 094** submarine and is expected to arm the future **Type 096**<sup>79</sup>. It was tested in 2018 and 2019 and has a reported range of over 9,000 km. The **JL-3's** extended range enhances **China's** sea-based nuclear second-strike capability as it will allow it to target the **U.S.** (Hawaii) from waters near its coast, such as the South China Sea and Bohai Gulf.<sup>80</sup> If fired from the Chinese coastal area, the continental **U.S.** or Western Europe is not within range of sub-launched **JL-3** missiles. Still, Chinese submarines can sail closer if they venture into the Pacific Ocean, even if this would

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<sup>76</sup> Type 094 Jin-class History", GlobalSecurity.org, [https://www.globalsecurity.org/wmd/world/china/type\\_94-history.htm](https://www.globalsecurity.org/wmd/world/china/type_94-history.htm)

<sup>77</sup> "Chinese Commentator: China's Type 096 Nuclear Submarine, Paired With The JL-3 Third-Generation Intercontinental Submarine-Launched Ballistic Missiles, Will Be 'China's Best And Most Powerful Underwater Weapon'", The Middle East Media Research Institute, 25 May 2021, <https://www.memri.org/reports/chinese-commentator-chinas-type-096-nuclear-submarine-paired-jl-3-third-generation>

<sup>78</sup> Tong Zhao, "Tides Of Challenge", Carnegie Endowment For International Peace, 2018, [https://carnegieendowment.org/files/Zhao\\_SSBN\\_final.pdf](https://carnegieendowment.org/files/Zhao_SSBN_final.pdf)

<sup>79</sup> Lieutenant-Commander Edward (Ned) Feltham, "The Undersea Dragon: China's Submarine Force and its Impact" Niobe Papers, No. 19, Naval Association of Canada, 2023, <https://www.navalassoc.ca/wp-content/uploads/2023/10/Feltham-PLAN-submarines.pdf>

<sup>80</sup> Luke Caggiano, "China Deploys New Submarine-Launched Ballistic Missiles", Arms Control Association, May 2023, <https://www.armscontrol.org/act/2023-05/news/china-deploys-new-submarine-launched-ballistic-missiles>

expose them to anti-submarine forces<sup>81</sup>. The **JL-3** is equipped with multiple independent targetable re-entry vehicles (MIRV).

#### e. A rapid pace of construction

In 2022<sup>82</sup>, the **U.S. Department of Defense** published its Annual Report to Congress regarding the Military and Security Developments Involving the People's Republic of China. In this report, the **DoD** noted that the **PLAN** constructed at least twelve SSBNs and SSNs in the last fifteen years. These include two **Type 93** SSNs, four **Type 93A** SSNs, and six **Type 094** SSBNs.

#### f. Conclusion

As of 2023<sup>83</sup>, the **PLAN** possesses both a nuclear-powered submarine fleet and a robust diesel-electric submarine fleet. With fifty-six submarines, **China** is closing the gap with the **U.S.**, which currently has sixty-seven<sup>84</sup>. The **PLAN** operates six nuclear-powered ballistic missile submarines, six nuclear-powered attack submarines, and forty-eight diesel-powered/air-independent attack submarines. The diesel-electric submarine fleet remains the backbone of **China's** submarine forces. **China** is notably increasing the number of conventional submarines capable of firing advanced anti-ship cruise missiles. Its submarine force continues to grow as it works to mature its submarine technology. The **PLAN's** submarine force is expected to grow to sixty-five units by 2025 and eighty units by 2035, despite the ongoing retirement of older generation submarines. The Chinese Navy will operate the **Type 094** and **Type 096** concurrently and could have up to eight SSBNs by 2030.

According to the 2023 **U.S. Department of Defense** Military and Security Developments Involving the People's Republic of China Report to Congress,<sup>85</sup> the **PLAN** has prioritized modernizing its submarine force.

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<sup>81</sup> "Hearing On China's Nuclear Forces", United States-China Economic and Security Review Commission, 10 June 2021, [https://www.uscc.gov/sites/default/files/2021-06/June\\_10\\_2021\\_Hearing\\_Transcript.pdf](https://www.uscc.gov/sites/default/files/2021-06/June_10_2021_Hearing_Transcript.pdf)

<sup>82</sup> "Military and Security Developments Involving the People's Republic of China", United States Department of Defense, Annual Report to Congress, 2022 <https://s3.documentcloud.org/documents/23321290/2022-military-and-security-developments-involving-the-peoples-republic-of-china.pdf>

<sup>83</sup> "China Submarine Capabilities", The Nuclear Threat Initiative, 06 March 2023, <https://www.nti.org/analysis/articles/china-submarine-capabilities/>

<sup>84</sup> "Submarines by Country", Wisevoter, <https://wisevoter.com/country-rankings/submarines-by-country/>

<sup>85</sup> "Military and Security Developments Involving the People's Republic of China", United States Department of Defense, Annual Report to Congress, 2023, <https://media.defense.gov/2023/Oct/19/2003323409/-1/-1/1/2023-MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF>



## V. THE PLAN'S AMPHIBIOUS TRANSPORT DOCKS & LANDING HELICOPTER DOCKS

### 1. Type 071

The **Type 071**<sup>86</sup>, also known as the Yuzhao-class, is a cornerstone of the PLAN's amphibious capabilities. It was designed and constructed by **Hudong-Zhonghua Shipbuilding**, a subsidiary of **China State Shipbuilding Corporation (CSSC)**. This class of amphibious transport dock has a displacement of around 25,000 tons, a length of 210 meters, and a width of 28 meters. The **Type 071s** are powered by a combined diesel and diesel (CODAD) propulsion system, providing a maximum speed of 25 knots and a range of 10,000 nautical miles at 18 knots. They feature a vehicle deck, well deck, landing deck, and hangar, and they can also accommodate a marine battalion of 500 to 800 troops and carry up to 65 amphibious armored vehicles<sup>87</sup>. The stern helicopter deck can hold two **Harbin Z-8** transport helicopters, and the hangar up to four **Z-8s**. The well deck carries four **Type 726** air-cushioned landing craft. The Vehicle deck accommodates amphibious assault vehicles, including **ZBD05 IFV** and **ZTD-05** light tank. The **Type 071s** are armed with a 76mm naval gun, 30mm close-in weapon systems (CIWS), and several countermeasures. They could incorporate a 32-unit vertical launch system for Red Flag-16 or Haihongqi-7 ship-to-air missiles and have

They play a crucial role in amphibious landing missions and as fleet command and control centers during amphibious operations. They can also provide humanitarian aid and be used in civilian evacuation operations.

Additionally, the ship should have ground fire support capabilities, and the suggestion includes mounting a Russian AK-130 twin-tube 130mm gun or a domestically made 100mm gun for cost considerations. The **Type 071** LPD emerges as a versatile and formidable amphibious vessel with capabilities for troop transport, air support, and self-defense.

The Kunlun Shan<sup>88</sup>, the lead ship of the **Type 071**, was laid down in June 2006, successfully launched in December 2006, and commissioned to the South Sea Fleet at Zhanjiang Naval Base in 2007. The estimated production cost of this vessel is supposed to be around \$300 million. The Jinggang Shan was launched in November 2010 and commissioned to the South Sea Fleet. The Changbai Shan was launched in September 2011 and commissioned in September 2012 into the South Sea Fleet. The Yimeng Shan was launched in January 2015 and commissioned in February 2016 into the East Sea Fleet. In September 2018, the Longhu Shan, was commissioned. The Wuzhi Shan was launched in January 2018 and commissioned in January 2019 in the South Sea Fleet. The Wanyang Shan was launched in December 2018 and commissioned in the East Sea Fleet. The Qilian Shan was launched in June 2019 and commissioned in November 2020 in the South Sea Fleet.

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<sup>86</sup> "Type 071 amphibious transport dock", Wikipedia,

[https://en.wikipedia.org/wiki/Type\\_071\\_amphibious\\_transport\\_dock](https://en.wikipedia.org/wiki/Type_071_amphibious_transport_dock)

<sup>87</sup> "Type 071 Landing Platform Dock (LPD)", Naval Technology, 09 February 2016, <https://www.naval-technology.com/projects/type-071-landing-platform-dock-lpd/?cf-view>

<sup>88</sup> "Chinese landing ship Kunlun Shan", Wikipedia,

[https://en.wikipedia.org/wiki/Chinese\\_landing\\_ship\\_Kunlun\\_Shan](https://en.wikipedia.org/wiki/Chinese_landing_ship_Kunlun_Shan)

The **Type 071** plays a crucial role in enhancing the **PLAN**'s amphibious and expeditionary warfare capabilities and shows **China**'s commitment to modernizing its naval forces and expanding its maritime reach.

More than twenty years after the start of the **Type 071** program, and with eight units in total produced, the production seems to have stopped. The **PLAN** appears to focus on the **Type 075** and the possible **Type 076**.

## 2. Type 075

The Concept and design work on the **Type 075** class Landing Helicopter Dock (LHD) started in 2011 and was led by the 708 Research Institute of the **China Shipbuilding Industry Corporation**. In 2016, the **Central Military Commission's Equipment Development Department** and the **PLAN** had divergent views on the design. The **Equipment Development Department** was in favor of a smaller design, which would have reduced the ship's tonnage but would have better conformed to existing propulsion systems. Construction began in 2018 after the **PLAN** design prevailed, and in April 2021, the **PLAN** commissioned the Hainan, the lead ship of **Type 075**<sup>89</sup>. The second **Type 075**, the Guangxi, was launched in April 2020 and commissioned in December 2021. The third one, the Anhui, was launched in January 2021 and commissioned in October 2022<sup>90</sup>.

As the largest amphibious warship in the **PLAN**, its development marked a significant advancement in **China**'s maritime power projection capabilities. It aligns with **China**'s growing assertiveness in the East and South China Seas and its power projection into the Pacific and beyond<sup>91</sup>. It complements the smaller **Type 071** amphibious transport dock and enhances its amphibious and command and control capabilities as well as the medical facilities. The **Type 075** is crucial in **PLAN** safeguarding **China**'s overseas interests. Its primary role is to provide air support and rapidly deliver ground forces onto objectives within an adversary's defensive depth with reduced exposure to adversary fire. It has a flight deck over 230 meters long and a displacement between 30,000 and 40,000 tons. The **Type 075** is a versatile platform for landing operations, and it features a hangar capable of accommodating nearly 30 helicopters, a deck for simultaneous take-off and landing of multiple helicopters (**Z-20** and **Z-8**<sup>92</sup>), and a dock for amphibious vehicles, landing craft, and air-cushioned landing craft (LCAC)<sup>93</sup>. These amphibious armored vehicles include the **Type 63A** and **ZBD 2000** amphibious light tanks, **ZBD 2000** amphibious infantry fighting vehicles, and landing craft or the **Type 726A** hovercraft.

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<sup>89</sup> Conor M. Kennedy and Daniel Caldwell, "China Maritime Report No. 23: The Type 075 LHD: Development, Missions, and Capabilities", China Maritime Studies Institute, U.S Naval War College, October 2022, <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1022&context=cmsi-maritime-reports>

<sup>90</sup> Xavier Vavasseur, "China Launches 4th Type 075 LHD for the PLAN", Navy Recognition, 14 December 2023, <https://www.navalnews.com/naval-news/2023/12/china-launches-4th-type-075-lhd-for-the-plan/>

<sup>91</sup> Aadil Brar "Photo Reveals China's New Amphibious Assault Ship for D-Day-Style Invasion", Newsweek, 20 December 2023, <https://www.newsweek.com/china-amphibious-assault-ship-type-075-taiwan-south-china-sea-1854084>

<sup>92</sup> Liu Xuanzun, "China's new amphibious assault ship to carry multi-type helicopters, 'enters world-class' ranks", Global Times, 27 April 2021, <https://www.globaltimes.cn/page/202104/1222263.shtml>

<sup>93</sup> "Chinese landing helicopter dock Hainan", Wikipedia, [https://en.wikipedia.org/wiki/Chinese\\_landing\\_helicopter\\_dock\\_Hainan](https://en.wikipedia.org/wiki/Chinese_landing_helicopter_dock_Hainan)

The **Type 075** class is comparable in size to the **U.S. Navy's** Wasp-class amphibious assault ships, and it surpasses its Japanese and South Korean counterparts. Its various defensive armaments include four **HHQ-10** short-range air defense missile systems and two **H/PJ-11** close-in weapon systems<sup>94</sup>.

### 3. Type 76

In 2020, the **China State Shipbuilding Corporation (CSSC)** 708 Institute released procurement requests for what could be a new class of amphibious assault ships called the **Type 076**<sup>95</sup>. It could include electromagnetic catapults, a 21-megawatt gas turbine, and diesel powerplants, a medium-voltage direct current integrated power system, and a floodable well deck enabling the deployment of vehicles and amphibious craft based on current speculations regarding its features<sup>96</sup>. The **Type 76** would have the ability to deploy fixed-wing aircraft and UAVs. The **Type 076** could be used for island-seizing operations in the South China Sea, in a potential Taiwan invasion, or in safeguarding **China's** overseas interests<sup>97</sup>. In September 2023, press reports stated that **China** had completed the construction of a dry dock that could possibly be used to build the **Type 076**. Still, these are currently only speculations, and developing this new platform may take years for the **PLAN**.

## VI. THE PLAN'S HOVERCRAFTS

### 1. Type 716

In 1962, the **708th Research Institute** was asked to design a prototype LCAC to supply coastal islands. The **Type 716**<sup>98&99</sup> LCAC was completed by **Hudong Shipbuilding** in Shanghai in 1978. It weighed 16 tons, could carry a 2-ton payload, and could reach a top speed of 100 km/h. The **Type 716** never entered mass production due to a fatal design flaw in its aviation piston gasoline engine, which posed safety risks.

In 1983, an upgraded version, the **Type 716 II**, entered service. It replaced the gasoline engine with three Deutz high-speed diesel engines. The redesigned propulsion systems and aprons addressed the safety concerns and enhanced performance.

These programs provided valuable experience that became useful in developing the later **Type 722** class LCAC.

<sup>94</sup> "Type 075 class", Military Today, [https://www.militarytoday.com/navy/type\\_075\\_class.htm](https://www.militarytoday.com/navy/type_075_class.htm)

<sup>95</sup> "Type 076 LHA - Aviation Assault Ship", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/type-076.htm>

<sup>96</sup> "Type 076 landing helicopter dock", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_076\\_landing\\_helicopter\\_dock](https://en.wikipedia.org/wiki/Type_076_landing_helicopter_dock)

<sup>97</sup> Liu Xuanzun, "Media speculate on China's possible next generation amphibious assault ship Type 076", Global Times, 24 July 2020, <https://www.globaltimes.cn/content/1195509.shtml>

<sup>98</sup> "Type 716 air cushion boat", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/type-716.htm>

<sup>99</sup> "Jinsha II-class LCAC", Wikipedia, [https://en.wikipedia.org/wiki/Jinsha\\_II-class\\_LCAC](https://en.wikipedia.org/wiki/Jinsha_II-class_LCAC)

## 2. Type 722

The **Type 722**<sup>100</sup> Landing Craft Air Cushioned (LCAC) was developed based on the experience gained from the Type 716 at the request of the **PLAN**. The design was approved in 1975 by the **708th Research Institute**, and the first prototype was built in 1979. It has a load capacity of 15 tons or a company of soldiers. Four 1100 kW aviation piston engines power the **Type 722** which has a maximum speed of 50 knots. Due to performance issues, including engine reliability and corrosion, an improvement program was launched under a joint team composed of the 702nd Research Institute and the 708th Research Institute.

The **Type 722 II** was built with a new type of magnesium-aluminum alloy and adopted an indigenous gas turbine engine, enhancing performance and seawater corrosion resistance. Land-based and landing tests were conducted, and by 1989, the first **Type 722 II** entered service. Its cargo capacity was limited to 20 tons, and only one craft was built, and it ended up being decommissioned in 2001.

## 3. Type 726

The **Type 726** Yuyi-class hovercraft succeeded the **Type 722 II**. It is a medium-sized hovercraft developed by the China Aviation Industry Corporation and constructed by the Jiangnan Shipyard. The first **Type 726** hovercraft entered service in 2010. It is designed to operate from the **Type 071** and the **Type 075**<sup>101</sup>. The combination of these ships and the hovercraft enables the efficient delivery of personnel and equipment from the near shore to the beach. The **Type 726** is crucial in **China's** amphibious landing operations. It can carry mechanized infantry fighting vehicles, 40 fully armed infantry, or a tank and two infantry fighting vehicles and land on over 70% of beaches. The **Type 726** can operate in various environments, including ice, snow, swamps, and reef beaches<sup>102</sup>. It has a displacement of about 150-160 tons and can carry around 50 tons at speeds of 60-80 knots. The **Type 726** is armed with a 12.7 mm machine gun<sup>103</sup>.

The **Type 726** was initially equipped with Ukrainian UGT-6000 gas turbines that drive four lift fans and two air propellers. Unfortunately, they had vibration and noise issues, resulting in a temporary production halt. In 2003, a new variant, the **Type 726A**, was introduced, and the domestically developed QC-70 gas turbines replaced the previous ones. These new gas turbines had improved performance with an output power of about 7200 kW, compactness, and reduced weight<sup>104</sup>. A total of eight **Type 726As** were produced up until 2020.

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<sup>100</sup> "Type 722-II Dagu class Landing Craft Air Cushioned", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/dagu.htm>

<sup>101</sup> "Type 726 "Mustang" Yuyi-class hovercraft", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/type-726.htm>

<sup>102</sup> "Type 726 Yuyi-class hovercraft – Program", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/type-726-program.htm>

<sup>103</sup> "Type 726 Yuyi-class hovercraft – Design", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/type-726-design.htm>

<sup>104</sup> "Type 726 LCAC", [https://en.wikipedia.org/wiki/Type\\_726\\_LCAC](https://en.wikipedia.org/wiki/Type_726_LCAC)

## VII. THE PLAN'S LANDING SHIPS

In 1946, following World War II, the **U.S. Congress** approved the transfer of 271 surplus **U.S. Navy** ships to **China** free of charge. These included tank landing ships, medium landing ships, infantry landing craft, and tank landing craft. Some tank landing ships were repurposed as merchant ships for commercial transportation, while some were used for military purposes. Recognizing the importance of landing ships in coastal island operations, **China** started producing small ones, imitating Soviet-made T4-class landing craft in the early 1950s. In the 1960s, China began developing large and medium-sized landing ships, such as the **Type 073**.

### 1. Type 073

In the early 1960s, **China** recognized the need for large and medium landing ships that would have the potential to reach Taiwan<sup>105</sup>. The **Type 073** medium-sized landing ship emerged as a response to this requirement. The primary purpose of the **Type 073** class is to transport troops directly to the beachhead during sea landing operations. Additionally, it can assist mine-laying ships in deploying defensive mines in offshore areas and serve various transportation tasks.

This class features the **Type 073**, which evolved into subsequent models such as the **Type 073II**, **Type 073IIY**, **Type 073III**, and the modern **Type 073A**<sup>106</sup>. Construction on **Type 073** began a month later in 1966, but was not launched until 1969 due to the Cultural Revolution. The **Type 073** class had a diesel double propeller, a displacement of 850 tons, a length of 69 meters, and a beam of 10.5 meters<sup>107</sup>. However, trials revealed that the vibrations were too important at high speed, and the **Type 073** did not enter mass production. Redesign work began on what would be the **Type 073II**.

In 1976, the production of **Type 073II**<sup>108</sup> started. It was launched in June 1978, and trials were carried out from 1978 to 1979. At the beginning of 1980, it ended its trials and was delivered to the PLAN. **Type 073II** introduced advancements in the diesel engine to solve the vibration problem. Mass production was canceled nonetheless due to unsolved reliability problems with the engine. The **Type 073IIY** was introduced to remedy these issues, and the two **Type 073II** units under construction were modified to this format until 1985. This modified version included more than 100 upgrades and engine enhancements. It has a capacity of 250 tons of supplies, or five medium tanks, or ten amphibious light tanks, or 500 fully equipped troops. It has a 2,800 km range at 14 knots. The **Type 073IIY** continued to be produced until 2002. The last units had a slightly larger displacement at around 2,000 tons and more advanced electronics and machinery. This latest batch is referred to as the **Type 073A**.

<sup>105</sup> "Type 073 Landing Ship Medium [LSM]", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/type-073.htm>

<sup>106</sup> "Type 073 landing ship", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_073\\_landing\\_ship](https://en.wikipedia.org/wiki/Type_073_landing_ship)

<sup>107</sup> "Type 073 Landing Ship: Strengthening the amphibious power of the Chinese Navy", Military-Wiki.com, 20 October 2021, <https://military-wiki.com/type-073-landing-ship-strengthening-the-amphibious-power-of-the-chinese-navy/>

<sup>108</sup> "Type 073II Yudao-class medium landing ship", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/yudao.htm>

## 2. Type 072

The **Type 072**<sup>109</sup> Yukan-class landing ship began entering service in the early 1980s. At the time, the PLAN lacked advanced landing ships, amphibious assault ships, and dock landing ships. The **Type 072** features a bow ramp handling a 50-ton load and a rear ramp handling a 20-ton load. It can carry a medium tank company and an infantry company or load an infantry battalion. The ship's large cabin area of over 700 square meters can transport supplies up to 2000 tons. **Type 072** measures 120m in length, 9m in depth, and 15m in width, has a draft of about three meters and a displacement of 3100 tons<sup>110</sup>. It is also armed with eight 57mm/50 guns and four 25mm/60 guns.

The **Type 072II**<sup>111</sup> landing ship (YuTing class) was built by Shanghai-based Hudong-Zhonghua Shipyard and commissioned between 1993 and 1995. These new versions have a new large helicopter deck that can accommodate medium helicopters. They were the first amphibious warfare ships that had a flight deck for helicopter take-off/landing. The **Type 072II** has the capacity to transport 250 troops, ten tanks, and 4 LCVPs. Their defensive capabilities include one **Type 66** twin 57 mm naval gun and three **Type 76** twin 37 mm naval gun. Only three are currently in service within the PLAN's East Sea Fleet<sup>112</sup>.

The **Type 072III**<sup>113</sup> was introduced around mid-2002 and featured a redesigned superstructure. They were built by the **China Shipbuilding Shipyard** in Shanghai, featuring a redesigned concealed bridge and enhancements in sealift capability. The **Type 072III** incorporates a helicopter platform at the stern, although it lacks a hangar. There are currently eleven ships in service with the PLAN. Six of them are deployed in the South Sea Fleet, and the remainder are stationed in the PLAN East Sea Fleet. The last ship was commissioned in April 2002. The **Type 072III** has a length of almost 120 meters, a beam of 16.4 meters, and a draft of 2.8 meters. It has a range of 3,000 nautical miles and a top speed of 14 knots. The ships can carry ten tanks, 500 tons of cargo, or 250 fully equipped troops. The armament seems to be the standard **Type 63F** 37mm AA gun that was installed on the **Type 72-II** class. In 2018, the PLAN tested a railgun on the Haiyang Shan, one of the ships of the **Type 072III**<sup>114</sup>.

The **Type 072A**<sup>115</sup> landing ship (Yuting II-class) was developed based on the **Type 072II** or **Type 072III** landing ships. It has a displacement of 3,770 tons, a speed of 17 knots, a length of 120 meters, a beam of 16.4 meters, and a draft of 3.2 meters. The **Type 072A** features a helipad for two medium helicopters and a vehicle deck that runs the full length of

<sup>109</sup> "Type 072 Landing Ship", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_072\\_landing\\_ship](https://en.wikipedia.org/wiki/Type_072_landing_ship)

<sup>110</sup> "Type 072 Yukan-class large landing ship", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/yukan.htm>

<sup>111</sup> "Yuting I - Type 072 II / Type 072-III - Yuting II - Type 072A", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/yuting.htm>

<sup>112</sup> "Type 072II Landing Ship", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_072II\\_landing\\_ship](https://en.wikipedia.org/wiki/Type_072II_landing_ship)

<sup>113</sup> "Yuting I - Type 072 II / Type 072-III - Yuting II - Type 072A", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/yuting.htm>

<sup>114</sup> Shane McGlaun, "Chinese Warship Spotted With Hypersonic Railgun After US Navy Bails On Futuristic Weapon", HotHardware, 05 February 2018, <https://hothardware.com/news/chinese-hypersonic-railgun>

<sup>115</sup> "Type 072A Landing Ship", [https://en.wikipedia.org/wiki/Type\\_072A\\_landing\\_ship](https://en.wikipedia.org/wiki/Type_072A_landing_ship)

the ship with bow doors and a stern ramp. A first batch of nine ships was commissioned between 2003 and 2005, and a second batch, including four ships from the Wuchang shipyard and two from the Fujian shipyard, started entering service in 2015. The first nine **072A** were equipped with a twin 37mm turret, and in the second batch, this was replaced by an **H/PJ-17** 30 mm gun. It can carry ten armored vehicles and 250 troops. There are currently 15 active ships in this class.

### 3. Type 79

The **Type 79**<sup>116&117</sup> was launched in July 1976 and was initially intended for North Vietnam, which needed a landing ship capable of carrying around 200 tons of cargo with a maximum speed of 12 knots. The **PLAN** then decided to repurpose the **Type 79** for domestic use. It was built at Guangzhou Shipyard and was subdivided into two subclasses: **Type 079I** and **Type 079II**. Due to a slow speed and poor ability to operate in bad weather conditions, work began on an updated version completed in 1977. The **Type 079** had a length of 60.3 meters, a width of 10 meters, and a depth of 2.63 meters. It was powered by two sets of 6300ZC diesel engines producing 600 horsepower each. It had four 61-type double 25mm cannons and two 107mm 12-barrel rocket launchers.

The main difference between the two versions was that the **Type 79II** was larger, with a length of 72 meters, a width of 13.8 meters, and a depth of 2.6 meters. The size of the crew was also increased to 109 due to improved machinery. Armament was also strengthened by the addition of two **BM21** 122 mm rocket launchers. Thirty-one ships from both classes were built, and by 2018, most units had been decommissioned and scrapped.

### 4. Type 074

The **Type 074**<sup>118</sup> landing ship (Yuhai-class) succeeded the **Type 079** and was built at the Wuhu Shipyard between 1995 and 2000. It was designed to address the shortcomings of its predecessor. A significant redesign was needed to reach the requirements, and the **Type 074** ended up as a cross between the **Type 079** and the **Type 271** landing craft. The **Type 074** is used for tactical beach landings and can carry two main battle tanks, six light amphibious tanks, or 350 fully equipped troops. It has a cargo capacity of up to 100 tonnes. It is also armed with three **Type 61** dual-25mm anti-aircraft artillery guns or **Type 81H** 122mm multiple rocket launchers. The **Type 074** has a displacement of 800 tonnes, a length of 58.4 meters, a beam of 10.4 meters, and a draft of 2.7 meters.

The **Type 074A** (Yubei-class) is derived from the **Type 074** and carries more than 800 tons, including three **Type 96** tanks or six **Type 63A** amphibious tanks. It has a straight-through

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<sup>116</sup> “Type 079 landing ship”, Wikipedia, [https://en.wikipedia.org/wiki/Type\\_079\\_landing\\_ship](https://en.wikipedia.org/wiki/Type_079_landing_ship)

<sup>117</sup> “Type 079 Yulian-class Landing Ship Medium [LSM]”, GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/type-079.htm>

<sup>118</sup> “Type 074 Yuhai LSM / Type 074A Yubei LCU”, GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/yuhai.htm>

deck and can transport various cargo, vehicles, or troops, making it versatile for wartime and peacetime operations. The island side deckhouse is on the right side of the ramp, and a diesel engine drives the dual-machine, double-propeller, and double-rudder. It has a length of 58.4 meters, a beam of 19.4 meters, and a draft of 2.7 meters. It is armed with two **Type 61** 25mm AAA guns.

## VIII. THE PEOPLE'S LIBERATION ARMY NAVY - MARINE CORPS

The **People's Liberation Army Marine Corps (PLANMC)** is subordinate to the **PLAN** as it organizes, manages, trains, and equips it. Its missions include military operations such as amphibious warfare, expeditionary operations, rapid responses, training foreign troops, conducting counter-piracy operations, and seizing and protecting small reef island outposts. Its other missions include protecting **China's** interests worldwide, such as resources, infrastructure, diplomatic missions, citizens overseas, business enterprises, and projects related to the Belt and Road Initiative.

The **PLANMC** was initially established in 1953 for amphibious operations against Nationalist-held islands. It was disbanded in 1957 but was re-established in 1979<sup>119</sup>. In 1980, the 1st Marine Brigade was activated, and the **PLANMC** was expanded in 1998 with the formation of the 164th Marine Brigade. It operates under the Southern, Eastern, and Northern Theater Commands. It was initially tasked with defending the **PLAN** mainland bases and **China's** outposts in the South Sea Fleet, Paracel, and Spratly Islands. The **PLANMC** has seen a significant expansion and restructuring under President **Xi Jinping**. In 2016, President **Xi Jinping** announced an increase in numbers. Prior to 2017, the **PLANMC** only had two brigades and 12,000 personnel focused on South China Sea operations. The **PLANMC** underwent significant reforms, including reorganizing brigade structures and implementing combined arms battalions. In 2020, President **Xi Jinping** decided to further increase support for **PLANMC** in terms of manpower, equipment, training, and overall development. As of 2022, the **PLANMC** brigades consist of nine battalions, each specializing in various functions. These include six Marine Brigades, a Naval Shipborne Aviation Brigade, a Special Operations Brigade called the Jiaolong (*Water Dragon*), and four supporting brigades, totaling 40,000 personnel<sup>120</sup>. The Special Operations Brigade was created in 2015 and can operate in a wide range of environments, from deserts to frozen mountains, and conduct airborne, surface, and underwater infiltration missions<sup>121</sup>.

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<sup>119</sup> "People's Liberation Army Navy Marine Corps", Wikipedia,

[https://en.wikipedia.org/wiki/People%27s\\_Liberation\\_Army\\_Navy\\_Marine\\_Corps](https://en.wikipedia.org/wiki/People%27s_Liberation_Army_Navy_Marine_Corps)

<sup>120</sup> Conor Kennedy, "China Maritime Report No. 15: The New Chinese Marine Corps: A "Strategic Dagger" in a Cross-Strait Invasion", China Maritime Studies Institute, U.S. Naval War College, October 2021, <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1014&context=cmsi-maritime-reports>

<sup>121</sup> Michael Peck "China's Special Forces: The Most Elite Group You've Never Heard Of?", The National Interest, 02 July 2021, <https://nationalinterest.org/blog/reboot/chinas-special-forces-most-elite-group-youve-never-heard-189021>



**China's** objectives for strengthening the **PLANMC** revolve around three main goals. The first one is defending and attacking islands and reefs, particularly in the South China Sea, where **China** has expanded its control. This involves potential actions against Taiwan and the Senkaku Islands. The second one would be playing a critical role in a full-scale invasion against Taiwan. It would include breaking through defenses and establishing bridgeheads in support of a broader amphibious mechanized force. The third one is enhancing the **PLANMC's** expeditionary capabilities.

The expansion of the **PLANMC** is due to **China's** goal to create a marine force capable of power projection far from its shores, challenging the dominance of the **U.S. Navy** and **U.S. Marine Corps** in the western Pacific. Establishing a base in Djibouti also indicates a move towards securing **China's** interests beyond its periphery<sup>122</sup>. The **PLANMC** role expansion aligns with the **PLAN's** near-seas defense and far-seas protection strategy<sup>123</sup>. There are currently efforts to bolster amphibious warfare capabilities, focusing on training new unit commanders.

The **PLANMC** is equipped with heavy, medium, and light assets, including amphibious tanks, infantry fighting vehicles, and All-Terrain Vehicles<sup>124</sup>. The Infantry Fighting Vehicles (IFVs) and Armored Vehicles include the **Type 05** Amphibious IFV<sup>125</sup>, the **ZTL-11** Assault Gun (part of the **Type 08**<sup>126</sup> wheeled armored vehicle family), the **ZBL-09**<sup>127</sup> Armored personnel carrier, the **Type 15**<sup>128</sup> light tank, the **Type 63A**<sup>129</sup> Amphibious Light Tank, the **Type 77** Amphibious Armored Personnel Carrier and the **WZ-55**<sup>130</sup> and **Type 86**<sup>131</sup> infantry fighting vehicles. The **PLANMC** is also equipped with artillery and anti-aircraft systems such as the **Type 95**<sup>132</sup> Self-Propelled Air Defense Platform, the **Type 89** self-propelled howitzer, the **Type 07**<sup>133</sup> self-propelled artillery, and various short-range surface-to-air missiles. It also has **Z-8** and **Z-9** helicopters.

The **PLANMC** collaborates with the **PLA** Ground Force amphibious combined-arms brigades under a joint-operation command structure. The **PLANMC** capabilities are also

<sup>122</sup> Steve Ostrosky, "The PLANMC - Will the PLA Marine Corps become its own Service", Marine Corps Association, Marine Corps Gazette, September 2019

by <https://www.mca-marines.org/wp-content/uploads/56-The-PLANMC.pdf>

<sup>123</sup> Iida Masafumi, "The Current Status and Prospects of China's Growing Marine Corps", National Institute for Defense Studies, Commentary No. 238, 27 September 2022,

<https://www.nids.mod.go.jp/english/publication/commentary/pdf/commentary238e.pdf>

<sup>124</sup> "China's Has Formidable Marine Corps, But How Formidable Is PLA's Marine Corps", Eurasian Times, 15 January 2024, <https://www.eurasiantimes.com/chinas-has-formidable-marine-corps-but-plas/>

<sup>125</sup> "Type 05 Amphibious Fighting Vehicle", Wikipedia,

[https://en.wikipedia.org/wiki/Type\\_05\\_amphibious\\_fighting\\_vehicle](https://en.wikipedia.org/wiki/Type_05_amphibious_fighting_vehicle)

<sup>126</sup> "Type 08", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_08](https://en.wikipedia.org/wiki/Type_08)

<sup>127</sup> "ZBL-09", Military Today, [https://www.militarytoday.com/apc/zbl\\_09.htm](https://www.militarytoday.com/apc/zbl_09.htm)

<sup>128</sup> "Type 15 Tank", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_15\\_tank](https://en.wikipedia.org/wiki/Type_15_tank)

<sup>129</sup> "Type 63A", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_63A](https://en.wikipedia.org/wiki/Type_63A)

<sup>130</sup> "WZ-551", Wikipedia, <https://en.wikipedia.org/wiki/WZ-551>

<sup>131</sup> "Type 86 (infantry fighting vehicle)" Wikipedia,

[https://en.wikipedia.org/wiki/Type\\_86\\_\(infantry\\_fighting\\_vehicle\)](https://en.wikipedia.org/wiki/Type_86_(infantry_fighting_vehicle))

<sup>132</sup> "Type 95 SPAAA", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_95\\_SPAAA](https://en.wikipedia.org/wiki/Type_95_SPAAA)

<sup>133</sup> "PLZ-07", Wikipedia, <https://en.wikipedia.org/wiki/PLZ-07>

linked to the PLAN's construction of the **Type 075** landing helicopter dock, the **Type 071** amphibious transport dock vessels, and various amphibious assault vehicles.

## IX. THE PEOPLE'S LIBERATION ARMY NAVAL AIR FORCE

The **People's Liberation Army Navy Air Force**<sup>134&135</sup> (**PLANAF**) is the aviation branch of the **PLAN**. Its roots can be traced back to 1949-1950 when air divisions and aviation schools were founded. It acquired aircraft from the Soviet Union, and by 1952, the first air division had become operational. By 1954, it had five air divisions and one independent regiment; by 1960, it was organized into nine divisions and three independent regiments; and by 2007, it had seven air divisions. During the Cultural Revolution, several schools were closed, and the headquarters were even abolished in 1969. It was not until 1978 that they were re-established.

Its main tasks include providing air cover for navy ships, defending ports and naval installations, maritime patrol, anti-submarine warfare, aerial minelaying, ground attack, maritime strike, logistical support, and airborne early warning. The **PLANAF** has been rapidly modernizing and is narrowing the technological gap with Western air forces. The **PLANAF** has a strength of around 26,000 personnel and 710 aircraft, including combat aircraft such as fighter jets and bombers.

The **PLANAF** has a variety of bombers and fighters. These include the **Xian H-6** Strategic Bomber, a licensed variant of the Soviet **Tupolev Tu-16**, the **Xian JH-7** Fighter Bomber designed for precision strikes and interdiction missions, the **Shenyang J-8** Interceptor designed for engaging enemy aircraft and maintaining air superiority, the **Chengdu J-10** multirole fighter capable of air-to-air combat and ground attack missions, the **Shenyang J-11** an air superiority aircraft based on the Russian **Sukhoi Su-27** and the **J-15** a fourth-generation multirole fighter aircraft used for air-to-air and air-to-ground missions.

In 2021, an upgraded version of the **J-15** was revealed, which has improvements in missile pylons, the infrared search and track system, the radar, and the wings. It can carry the **PL-10** short-range combat missile<sup>136</sup>. The same year, the carrier variant of its **FC-31 (J-35)** twinjet 5th-generation fighter aircraft was successfully tested. The **J-35** incorporates features specific to carrier operations, such as a dual-wheel nose landing gear, a catapult launch bar, and a wing-fold mechanism. It also has a reworked vertical stabilizer configuration, improved avionics systems, and advanced radar technology<sup>137</sup>.

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<sup>134</sup> "People's Liberation Army Navy - Air Force Branch", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/plan-af.htm>

<sup>135</sup> Office of Naval Intelligence, "The People's Liberation Army Navy: A Modern Navy with Chinese Characteristics", Federation of American Scientists (FAS), August 2009, <https://irp.fas.org/agency/oni/pla-navy.pdf>

<sup>136</sup> Liu Xuanzun, "China reveals upgraded J-15 fighter jet; key aircraft carrier roles expected", Global Times, 16 December 2021, <https://www.globaltimes.cn/page/202112/1241685.shtml>

<sup>137</sup> David Cenciotti, "China's New Carrier-Based Stealth Fighter Makes First Flight", The Aviationist, 29 October 2021, <https://theaviationist.com/2021/10/29/j-35-first-flight/>

The **PLANAF** also operates various Medium-Altitude Long-Endurance (MALE) Unmanned Aerial Vehicles such as the **Guizhou Sunshine**, the **Chengdu Pterodactyl**, the **Harbin Giant Eagle**, and the **Guizhou Soar Dragon**.

The **Guizhou Sunshine** was developed by the **Guizhou Aircraft Industry Corporation**, a subsidiary of the **Aviation Industry Corporation of China (AVIC)**. It entered production between 2015 and 2016 and is designed for reconnaissance and surveillance missions.

The **Chengdu Pterodactyl** was developed by **Chengdu Aircraft Industry Group**, a subsidiary of **AVIC**. It is designed for aerial reconnaissance and surveillance missions and can carry air-to-surface weapons.

The **Harbin Giant Eagle** was developed by **Harbin Aircraft Industry (Group) Co., Ltd.** and **Beijing University of Aeronautics & Astronautics**. Its primary role is reconnaissance and surveillance missions, but it can also be equipped with missiles.

**Guizhou Soar Dragon** was developed by **Guizhou Aircraft Industry Corporation** and is designed for aerial reconnaissance missions.

The **PLANAF** also operates various helicopters. The **Changhe Z-8**, **Kamov Ka-28**, **Harbin Z-9**, and **Changhe Z-18** helicopters are mainly used for anti-submarine warfare. The **Kamov Ka-27** is dedicated to maritime search and rescue operations.

Various other planes are used for reconnaissance (**Xian JH-7**, **Shenyang J-80**), electronic warfare (**Shaanxi Y-8**), maritime patrol (**Shaanxi Y-8**), or transport (**Shijiazhuang Y-5**, **Xian Y-7**, **Shaanxi Y-8**, **Harbin Y-12**, **Xian MA60**).

## X. THE PLAN'S DESTROYERS

### 1. Type 07

The **Type 07** Anshan-class Destroyer<sup>138&139</sup> was **China's** first destroyer. In 1953, **China** bought worn-out Gordy-class destroyers from the **Soviet Union**. They served as the backbone of the **PLAN's** surface fleet for nearly four decades. The Anshan-class ships were withdrawn from active service by the 1990s. The four destroyers imported from the **Soviet Union** were respectively named the "Anshan", the "Fushun", the "Changchun", and the "Taiyuan". They were the **PLAN's** most powerful surface fighting ships at that time.

They had a length of 112.8 meters and a displacement of 2,040 tons at full load. They were powered by two sets of Tosi-gear steam turbines, producing 48,000 horsepower and enabling a maximum speed of 34 knots.

Initially, the **Type 07** were armed with four 130 mm guns, two 76.2 mm guns, four 37 mm guns, and torpedo tubes. They were modernized in the early 1970s, transitioning into ship-

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<sup>138</sup> "Type 07 Anshan-class Destroyer", GlobalSecurity.org,

<https://www.globalsecurity.org/military/world/china/anshan.htm>

<sup>139</sup> "Anshan-class destroyer", Wikipedia, [https://en.wikipedia.org/wiki/Anshan-class\\_destroyer](https://en.wikipedia.org/wiki/Anshan-class_destroyer)

to-ship missile destroyers. Two twin **HY-2** surface-to-surface missile launchers replaced the torpedo tubes, and Chinese twin-mount 37 mm guns replaced the original Soviet guns. The **Type 07** destroyers were also equipped with advanced radar and sonar systems. The boiler was changed during the modernization, and electronic equipment was also upgraded.

## 2. Type 051

The **Type 051** Luda-class destroyers were developed starting in 1966 and operated between 1968 and 1981. They served as the backbone of the **PLAN** until the early 2000s and were the first domestically produced anti-ship missile destroyers, even though they were based on Soviet destroyers such as the Neustrashimy and the Kotlin-class. The first ships entered service in the early 1970s, but few were fully operational before 1985. Between 1971 and 1991, 16 **Type 051** were completed.

The **Type 051** destroyers were the **PLAN**'s first oceangoing warships, marking a significant milestone in the country's naval capabilities. They were equipped with cutting-edge weaponry, including two triple launchers for **HY-2** anti-ship missiles, twin 130 mm gun mounts and four twin 37 mm anti-aircraft guns, and, in the case of the Kaifeng, quadruple launchers for **C-802** missiles. The **Type 051** destroyers were also equipped with Soviet sonars, depth charges, and rocket launchers for anti-submarine warfare. They were the first Chinese warships to feature an integrated combat direction system.<sup>140</sup>

Subsequent variants of the **Type 051** destroyers were introduced, such as **Type 051B**, **Type 051D**, **Type 051DT**, **Type 051Z**, **Type 051G**, and **Type 051S**.<sup>141</sup>

## 3. Type 051B

The **Type 051B**<sup>142</sup> Luhai class was the first indigenous destroyer to incorporate modern anti-air and anti-surface warfare systems. The **China Warship Design Institute** designed the **Type 051B** Destroyer. It was laid down in the Dalian shipyard in May 1996, launched in October 1997, and commissioned in February 1999 as the Shenzhen. With a displacement of approximately 6,000 tonnes, it was larger than its predecessors. As it served as a technology testbed to continue to modernize the **PLAN** destroyers, only one was developed. The main armament of the Shenzhen included a **Type 79** Twin 100mm main gun. It was later replaced by either a **H/PJ-26** 76mm gun or a larger **H/PJ-38** 130mm gun.

The Shenzhen was initially equipped with four **Type 76A** 37mm anti-aircraft guns, which were later replaced with modern Close-In Weapon Systems such as the **H/PJ-11** eleven-barreled 30 mm Gatling gun positioned on both the starboard and port sides. The **Type 051B** also had Vertical Launch Systems (VLS) capable of deploying **HQ-16** surface-to-air missiles and was also fitted with **C-802** anti-ship missiles. The Shenzhen was initially fitted with the **YJ-83** subsonic sea-skimming anti-ship cruise missile, and in 2020, it was replaced by the **YJ-**

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<sup>140</sup> "Luda class", Military Today, [https://www.militarytoday.com/navy/luda\\_class.htm](https://www.militarytoday.com/navy/luda_class.htm)

<sup>141</sup> "Type 051 Luda – Variants", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/luda-variants.htm>

<sup>142</sup> "Luhai class", Military Today, [https://www.militarytoday.com/navy/luhai\\_class.htm](https://www.militarytoday.com/navy/luhai_class.htm)

**12** anti-ship cruise missile that can reach Mach 2-3 and has a maximum range of up to 400 km<sup>143</sup>.

It was also equipped with advanced radar systems, including the **Type 381** search radar and **Type 364** targeting radar. The hangar was initially built to accommodate **Z-9** helicopters but was later modified to fit a **Ka-28** anti-submarine warfare helicopter<sup>144</sup>.

#### 4. Type 051D, Type 051Z, Type 051G, & Type 051S

The **Type 051D** incorporated various improvements such as changes to electronics, replacement of the double 57 mm naval guns with double 37 mm naval guns, and upgrades to radar systems, anti-submarine equipment, communication systems, and navigation systems. The modernization to the **Type 051DT** served as a platform for testing new equipment in the mid-1980s. It saw the replacement of the original dual 37mm naval gun with the French **Crotale** ship-to-air missile system and the addition of four quadruple-mounted **YJ-83** anti-ship missiles, **HQ-7** surface-to-air missiles, and **YJ-8** anti-ship missiles, significantly enhancing the destroyers' combat capabilities. There were also modifications to the combat data system, radar, and communication system, as well as the replacement and modernization of fire control systems and electronic equipment.

The **Type 051Z** served a command role and featured the **ZKJ-1** combat data system. It also had Soviet 57 mm anti-aircraft guns and a modern **Type 381A** 3-D radar system. Some ships of this class were converted into helicopter destroyers, replacing aft gun turrets with hangars and flight decks for helicopters.

The **Type 051G** and **Type 051G2** variants marked another evolutionary step compared to previous versions of the 051 destroyer. They incorporated advanced radar systems, **YJ-8** anti-ship missiles, Italian anti-aircraft guns, and French sonar technology. It also featured enclosed bridges and hulls.

The **Type 051S** was originally intended to modernize the **Type 051** destroyers fully. However, the project faced challenges, and only a few modifications were implemented due to budget constraints.

#### 5. Conclusion:

Despite their technological advancements for the time, the **Type 051** destroyers still fell short compared to contemporary Soviet and American destroyers. They lagged in terms of

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<sup>143</sup> "Chinese Navy Type 051B destroyer upgraded with 16 container launchers for YJ-12 supersonic anti-ship missile", Army Recognition, 04 May, 2020, <https://www.navyrecognition.com/index.php/focus-analysis/naval-technology/8355-chinese-navy-type-051b-destroyer-upgraded-with-16-container-launchers-for-yj-12-supersonic-anti-ship-missile.html>

<sup>144</sup> "Chinese Navy (PLAN) Refitting its Type 051B Destroyer Shenzhen with CIWS and VLS System", Navy Recognition, 04 January 2016, [https://www.navyrecognition.com/index.php?option=com\\_content&view=article&id=3429](https://www.navyrecognition.com/index.php?option=com_content&view=article&id=3429)

command-and-control facilities, living conditions, communication and electronic equipment hull design, armament, and sensor systems. The **Type 051** destroyers were criticized in military circles due to shortcomings in air defense, anti-submarine capabilities, structural design, and overall seaworthiness.

Still, these destroyers marked a significant advancement in Chinese shipbuilding technology and laid the groundwork for future developments in the country's naval fleet as they provided valuable experience in the design and operation of medium and large naval vessels.<sup>145</sup>

## 6. The Sovremenny-class

In 1996, the **PLAN** purchased two unfinished Sovremenny-class destroyer hulls from the Russian Navy. The initial two vessels were acquired under **Project 956E**, and later variants under **Project 956EM**. The **Project 956E** vessels (Hangzhou and Fuzhou) were commissioned in 1999 and 2000, and the **Project 956EM** vessels (Taizhou and Ningbo) were commissioned in 2005 and 2006. It is estimated that the cost of purchasing the two ships of Project 956A was approximately \$600 million in the mid-1990s, while the cost for Project 956EM was around \$1.4 billion in the early 2000s.<sup>146</sup>

The acquisition of Sovremenny-class destroyers reflected **China's** aspiration to develop a blue-water fleet capable of projecting power across vast distances. These destroyers bolstered **China's** surface warfare capabilities and posed a significant threat to Taiwan, challenging its regional naval defenses, which in response deployed Kidd-class destroyers. Their Sunburn missile system, designed to engage carrier battle groups also presented challenges to the **U.S. Navy**. However, this acquisition did not fundamentally shift the power balance in the Pacific region. The **PLAN** also continued to focus on submarine construction and procurement with a strategic focus on deterring the deployment of carrier battle groups.

In 2016, the **PLAN** significantly upgraded its Hangzhou and Fuzhou destroyers with modern domestic systems in order to enhance their combat and communication capabilities. As part of the upgrade program, all original electronic systems and sensors were replaced with modern Chinese equivalents. Vertical Launch Systems replaced the **3S90** launchers for surface-to-air missiles in order to accommodate the latest **HQ-16C** naval SAM missiles. **YJ-12A** supersonic anti-ship missiles replaced the **KT-190** quadruple launchers for the **SS-N-22 Sunburn**. The destroyers retained their AK-130 main guns forward and aft.<sup>147</sup>

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<sup>145</sup> "Type 051 Luda-class guided missile destroyer", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/luda.htm>

<sup>146</sup> Liu Xuanzun, "PLA Navy's 2nd Sovremenny-class destroyer returns after upgrades", Global Times, 17 March 2022, <https://www.globaltimes.cn/page/202203/1255081.shtml>

<sup>147</sup> "China's PLAN Upgrading its Project 956E Destroyers with VLS and YJ-12A Anti-Ship Missiles", Navy Recognition, 15 April 2016, [https://www.navyrecognition.com/index.php?option=com\\_content&view=article&id=3848](https://www.navyrecognition.com/index.php?option=com_content&view=article&id=3848)

## 7. Type 052

The **Type 052**<sup>148</sup> Luhu-class destroyers consisting of the Harbin and Qingdao were intermediate between the obsolete **Type 051** and the modern **Type 052B** destroyers. Their introduction in 1993 was a significant advancement for the **PLAN** as they departed from older designs. They served as important milestones in the **PLAN**'s modernization and were essential in **China**'s efforts to build a blue-water navy capable of power projection beyond its traditional sphere of influence<sup>149</sup>.

The **Type 052** destroyers had a displacement ranging from 4,200 tons to 4,800 tons at full load and measured approximately 144 meters in length and 15.3-16 meters in beam. They were developed using a blend of indigenous design and imported technologies from the **U.S.** and the **E.U.** Faced with limitations due to the embargo imposed after the events of 1989 in Tiananmen Square, **China** had to turn to **Russia** and **Ukraine** for technology support.

The **Type 052** destroyers were the first to use a combined diesel or gas propulsion system. It featured two GE LM 2500 gas turbines and two MTU 12V 1163 TB83 diesel turbines.

They were equipped with modern combat direction systems, advanced sensors, air and surface search radars, sonar systems, and weapons systems. The armament consisted of eight **YJ-1** or **C-802** anti-ship missiles, a Crotale octuple launcher for surface-to-air missiles, and a mix of 100mm and 37mm guns for close-in defense. The **Type 052** could also hold two **Harbin Z-9A** or **Kamov Ka-27** helicopters for anti-submarine warfare.

The **Type 052** had advanced radar and sonar systems, including the **TSR 3004 Sea Tiger** and hull-mounted active search and attack sonars. They were also equipped with torpedoes, mortars, and decoy launchers for anti-submarine and electronic warfare systems.<sup>150</sup>

The Luhu-class ships underwent significant upgrades in 2011, addressing integration issues and enhancing their electronic warfare capabilities. Over their lifespan the **Type 052** destroyers underwent refits to improve their capabilities, including changes to sensors and weapons, gas turbine replacements, and hull modifications. However despite their advancements, they fell short of matching contemporary designs from western countries and their allies in the pacific region.

## 8. Type 052B

The **Type 052B**<sup>151&152</sup> Luyang-class destroyer represents a significant advancement in **PLAN**'s capabilities as it incorporates stealth features in its design. The sloped sides reduced external features, and radar-absorbent paint applied to the hull reduced the radar signature.

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<sup>148</sup> Dreadnaughtz, "Type 052 Luhu Class Destroyers", Naval Encyclopedia, 06 June 2018, <https://naval-encyclopedia.com/cold-war/china/luhu-class-destroyers.php>

<sup>149</sup> "Type 052 Luhu-class Multirole Destroyer", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/luhu.htm>

<sup>150</sup> "Type 052 Luhu-class Multirole Destroyer", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/luhu-specs.htm>

<sup>151</sup> "Type 052B Luyang-class Multirole Destroyer Guangzhou", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/luyang.htm>

<sup>152</sup> "Type 052B destroyer", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_052B\\_destroyer](https://en.wikipedia.org/wiki/Type_052B_destroyer)

Only two ships of this class, the Guangzhou and Wuhan, were commissioned in July and December 2004, respectively. The **Type 052B** also demonstrates **China's** progress in building a modern and capable surface fleet.

The **Type 052B's** were equipped with a wide variety of weapons systems, ensuring its capability to engage and neutralize various threats. These destroyers were the first to incorporate medium-range air defense by installing two Russian-made surface-to-air missile launchers with the **9M317 Shtil** air defense missile system. The air defense capabilities were nonetheless considered obsolete compared to contemporary destroyers from **Japan** or the **U.S.** The **Type 052B** destroyer was also equipped with four 4-cell launchers for the **YJ-83** anti-ship cruise missile with a striking range of 200 kilometers. Furthermore, a single-barrel 100mm gun mounted on the bow deck was capable of engaging both surface and air targets. The destroyers had anti-submarine warfare capabilities with two triple 324mm **Yu-7** antisubmarine torpedo tubes and two **Type 75** twelve-barrel antisubmarine rocket launchers. These capabilities were extended by accommodating a **Kamov Ka-28** helicopter equipped with torpedoes and deep charges in its stern hangar. The **Type 052B's** also had four 18-barrel multiple rocket launchers (MRLs) that could be used for various purposes such as antisubmarine warfare and launching decoys/chaffs, and the Type 730 seven-barrelled close-in defense system (CIWS).

## 9. Type 052C

The **Type 052C**<sup>153</sup> The Luyang II-class stealth destroyer shares similarities with the Type 052B destroyer, such as the same basic hull design as the **Type 052B**. One of the main differences is the addition of four fixed-phased array antennas in the forward superstructure. It incorporates Russian and Chinese indigenous systems. The first two ships, the Lanzhou and the Haikou, were laid down at the **Jiangnan Shipyard** in Shanghai in 2002 and entered service in 2004 and 2005, respectively, as part of the South Sea Fleet based at Zhanjiang. A total of six ships were operational by 2019<sup>154</sup>. The Type 52C is equipped with powerful air-defense guided missiles and radar-detection equipment and incorporates advanced sensors and weaponry. It represents a significant advancement in China's naval capabilities.

The **Type 052C**, which can accommodate a crew of 250 members, has a length of 153 meters, a beam of 16.5 meters, and a displacement of 6,600 tons at full load<sup>155</sup>. The **Type 052C** is powered by a combined diesel or gas (CODOG) propulsion system consisting of two Ukrainian DA80 gas turbines and two MTU 20V 956TB92 diesel engines. This provides the destroyer with a maximum speed of 30 knots.

The **Type 052C** destroyer is armed with a 100 mm **PJ-87** main gun with a rate of fire of 25 rounds per minute. It also carries 48 **HQ-9** naval surface-to-air missiles with a range of 200 kilometers. Additionally, the destroyer is equipped with two 4-cell launchers for the **YJ-**

<sup>153</sup> "Luyang-II Class / Type 052C Destroyer", Naval Technology, 06 October 2010, <https://www.naval-technology.com/projects/luyangclassmissilede/?cf-view>

<sup>154</sup> "Luyang II / Type 052C / Lanzhou Multirole Destroyer", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/luyang-ii.htm>

<sup>155</sup> "Type 052C Class (Luyang II Class) Chinese Destroyer", OE Data Integration Network (ODIN), [https://odin.tradoc.army.mil/WEG/Asset/Type\\_052C\\_Class\\_\(Luyang\\_II\\_Class\)\\_Chinese\\_Destroyer](https://odin.tradoc.army.mil/WEG/Asset/Type_052C_Class_(Luyang_II_Class)_Chinese_Destroyer)



62 anti-ship cruise missiles with a maximum range of 280 kilometers. Close-in defense is provided by two seven-barrel 30 mm **Type 730** CIWS. For Anti-submarine warfare, it is equipped with two triple 324 mm torpedo tubes that can fire the **Yu-7** torpedo. A Kamov **Ka-28** or Harbin **Z-9** helicopter can also operate from the rear hangar and flight deck.

The **Type 052C** destroyer features a four-array multifunction phased array radar (PAR) system similar to the Aegis AN/SPY-1 equipped by the American Arleigh Burke and Japanese Kongo classes. It is also fitted with a **Type 517H-1** long-range 2D air search radar, a Band Stand fire-control radar for anti-ship missiles and the main gun, two **Type 327G** fire control radars for CIWS, and a four-array multi-function phased array radar. The **Type 052C** destroyer is also equipped with a newly developed EW suite and a combat system derived from the French Thomson-CSF TAVITAC. Its command and decision system (CDS) system provides air defense, surface warfare (SUW), and anti-submarine warfare (ASW) capabilities. The **Type 052C** can also transfer combat data to other surface fleet units and aircraft through a data link and satellite communications.

In 2019, the **PLAN** deployed a new VTOL UAV from the Lanzhou **Type 052C** destroyer during a three-day maritime training exercise in the South China Sea. This UAV is designed to carry out various missions, including reconnaissance, search and rescue, communication relay, and damage assessment during amphibious landing operations.<sup>156</sup>

## 10. Type 052D

The **Type 052B** and **Type 052C** destroyers laid the groundwork for the advanced capabilities of the **Type 052D** Luyang III class destroyers<sup>157</sup>. The Kunming, the class's lead ship, was laid down in 2012 at the Jiangnan Shipyard in Shanghai and commissioned in 2014. The **Type 052Ds**, which have a crew of 280 people, are versatile destroyers capable of multi-role operations and effectively addressing air, surface, and underwater threats. The basic ship type and layout of the **Type 052D** is the same as that of the **Type 052C**, but the **Type 052D** superstructure has a larger inclination angle that provides better stealth performance.

The **Type 052D** destroyers are powered by a Combined Diesel or Gas (CODOG) propulsion system featuring two 28-megawatt gas turbines and two 6 MW diesel engines, driving two shafts, enabling a top speed of 30 knots.

The **Type 052D** destroyers are armed with a formidable array of weapons, including two 32-cell Vertical Launch Systems (VLS), allowing for the deployment of various missiles, such as the **HHQ-9** surface-to-air missile, **YJ-18** anti-ship cruise missiles, and **CY-5** anti-submarine missiles. They are also equipped with a 130 mm main gun and either a 7-barrelled or 11-barrelled close-in weapon system (CIWS) for close-range defense. The **Type 052D** also has torpedo tubes and **CY-5** anti-submarine rocket launchers.

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<sup>156</sup> Naval News Staff, "VTOL UAV Now Deployed From PLAN Type 052C Destroyer", Naval News, 05 March 2019, <https://www.navalnews.com/naval-news/2019/03/vtol-uav-now-deployed-from-plan-type-052c-destroyer/>

<sup>157</sup> "Type 052D destroyer", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_052D\\_destroyer](https://en.wikipedia.org/wiki/Type_052D_destroyer)

The **Type 052D**'s helicopter hangar typically holds either the **Kamov Ka-28** or the **Harbin Z-9C**, both of which serve in ASW roles. While the hangar space is limited to one helicopter, it still significantly enhances the destroyer's ability to conduct ASW missions.

In March 2021, an upgraded variation of the **Type 052D** destroyer, referred to as the **Type 052DL**, was commissioned<sup>158</sup> into the **PLAN**. Two years later, in March 2023, **China** launched two more **Type 052DL** destroyers<sup>159</sup>. The upgraded version was built by the **Jiangnan-Changxing Shipyard** and **Dalian Shipbuilding Industry Company** and featured improvements. The **Type 052DL** showcased significant improvements in design, sensors, and weapons compared to its predecessor. This included a new anti-stealth radar and an extended helicopter flight deck to accommodate the new **Z-20** helicopter. These destroyers have a displacement of 7,700 tons at full load and a length of 162 meters. They have 64 vertical launch system cells for various missiles, including surface-to-air, anti-submarine, and tactical cruise missiles.

**China** signaled its entry into modern surface combatant fabrication with the **Type 052C** and the **Type 052D**. Equipped with advanced systems and weaponry, they further underscored **China**'s commitment to naval advancement.

## 11. The Type 055

The development and construction of the **Type 055** destroyer<sup>160&161</sup>, the successor to **Type 052D** guided-missile destroyers, represent a significant milestone in **China**'s naval modernization efforts and its ability to compete with Western powers. It is a response to the **U.S. Navy**'s Arleigh Burke Class destroyers. The **Type-055** is a newer generation than its **U.S. Navy** counterparts, with a more modern appearance and design. While **China** classifies it as a destroyer, it would be categorized as a cruiser by international standards.

The origins of the **Type 055**<sup>162</sup> stealth guided-missile destroyer can be traced back to 1976, when the program was initiated. The **China Shipbuilding Industry Corporation 701 Research Institute**, **Jiangnan Shipyard**, and **Dalian Shipbuilding Industry Company (DSIC)**, collaborated on the initial design and development. The initial program ended up being canceled in 1983 due to technical obstacles. The program was once again approved at the end of 2009, and in April 2014, a full-scale mock-up of the **Type 055** superstructure was revealed. The lead ship, Nanchang, was built in just 29 months. It launched in June 2017 and was commissioned in January 2020<sup>163</sup>. By the end of 2022, eight vessels of this design were in

<sup>158</sup> "Chinese Navy commissions upgraded variation of the Type 052D destroyer", Army Recognition, 03 March 2021, <https://www.navyrecognition.com/index.php/news/defence-news/2021/march/9769-chinese-navy-commissions-upgraded-variation-of-the-type-052d-destroyer.html>

<sup>159</sup> Tayfun Ozberk, "China Launches Two More Type 052DL Destroyers In Dalian", Naval News. 12 March 2023 <https://www.navalnews.com/naval-news/2023/03/china-launches-two-more-type-052dl-destroyers-in-dalian/>

<sup>160</sup> Charlie Gao, "Why China's Type 055 Destroyer Deserves Your Attention", The National Interest, May 16, 2021, <https://nationalinterest.org/blog/reboot/why-chinas-type-055-destroyer-deserves-your-attention-185212>

<sup>161</sup> "Type 055 destroyer", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_055\\_destroyer](https://en.wikipedia.org/wiki/Type_055_destroyer)

<sup>162</sup> <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1004&context=cmsi-maritime-reports>

<sup>163</sup> Daniel Caldwell, Joseph Freda and Lyle J. Goldstein, "China's Dreadnought? The PLA Navy's Type 055 Cruiser and Its Implications for the Future Maritime Security Environment", China Maritime Report No. 5, China Maritime Studies Institute, U.S Naval War College, February 2020, <https://www.andrewerickson.com/wp->

service, with additional hulls under construction. Each **Type 055** has an estimated cost of approximately \$920 million. For comparison, the USS Zumwalt costs the U.S. Navy around \$7 billion<sup>164</sup>.

The **Type 055** main missions are area air defense and anti-submarine warfare. These destroyers serve as primary escorts for Chinese aircraft carriers. They also feature a helicopter deck that can accommodate a single medium-sized helicopter such as the **Harbin Z-9** and **Changhe Z-18**. A stern hangar facility can also accommodate up to two helicopters<sup>165</sup>.

The **Type 055** has a displacement of over 12,000 tons and is propelled by four 28-megawatt gas turbine engines, making it capable of reaching top speeds of up to 30 knots. It has an estimated cruising range of 5,000 nautical miles at 18 knots. Its propulsion system can accommodate potential upgrades in power generation technology.

The **Type 055** has various features that enhance its stealth capabilities, such as integrating sensors into a single mast, enclosing exhaust stacks within the superstructure, and incorporating infrared suppression devices. It also eliminates early warning radars on its rear half, resulting in cleaner lines and reduced observability.

The **Type 055** destroyer is equipped with a wide range of weapons. The heart of its offensive capabilities is its 112 vertical launch system (VLS) cells that can accommodate a variety of air-to-surface and surface-to-surface missiles. These include **YJ-18** supersonic anti-ship cruise missiles, **CJ-10** cruise missiles, **YJ-83** subsonic anti-ship cruise missiles, and **HQ-16** and **HQ-9** surface-to-air missiles. The **Type 055** also has a 130mm **H/PJ-38** naval gun at the bow, a 30mm **H/PJ-11** close-in weapon system (CIWS), and a 24-cell **HQ-10** short-range surface-to-air missile launcher for close-in defense. It is also equipped with defensive launchers mounted on both sides, which can deploy flares, chaff, active decoys, and anti-submarine rockets for defense against missiles and submarines<sup>166</sup>. Future variants of the **Type 055** are expected to incorporate even more advanced weapon systems, including an electromagnetic railgun capable of shooting hypersonic projectiles, Anti-ship ballistic missiles (ASBM), and high-energy lasers.

The **Type 055** destroyer is equipped with advanced sensors and radar systems that enhance its situational awareness and combat effectiveness. It was the first Chinese warship to feature dual-band planar radar arrays, providing exceptional capability in detecting anti-ship missiles. Its S-band **Type 346B** planar array radar provides air surveillance and tracking capabilities. It enables the detection of airborne threats over long ranges and simultaneously facilitates tracking multiple targets. The **Type 055** also features an X-band radar for precise target tracking and weapons guidance.

The **Type 055** is equipped with electronic support measures (ESM) and electronic attack capabilities that enable the detection and disruption of enemy radar and communications

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[content/uploads/2020/02/CMSI\\_China-Maritime-Report\\_5\\_China%E2%80%99s-Dreadnought-The-PLA-Navy%E2%80%99s-Type-055-Cruiser\\_Caldwell-Freda-Goldstein\\_202002.pdf](https://www.cmsi.com/content/uploads/2020/02/CMSI_China-Maritime-Report_5_China%E2%80%99s-Dreadnought-The-PLA-Navy%E2%80%99s-Type-055-Cruiser_Caldwell-Freda-Goldstein_202002.pdf)

<sup>164</sup> Maya Carlin, "China's 21st Century 'Battleship': Type 055 Destroyer Is Oozing with Firepower", The National Interest, 24 January 2024, <https://nationalinterest.org/blog/buzz/chinas-21st-century-battleship-type-055-destroyer-oozing-firepower-208820>

<sup>165</sup> "Type 055 Class Destroyers", Naval Technology, 11 September 2020, <https://www.naval-technology.com/projects/type-055-class-destroyers/>

<sup>166</sup> Joseph Trevithick, "Our Most Detailed Look Yet At China's Type 055 Super Destroyer", The War Zone, 03 August 2022, <https://www.twz.com/our-most-detailed-look-yet-at-chinas-type-055-super-destroyer>

systems, providing a significant advantage in the electronic battlespace. Sensor turrets with electro-optical and infrared cameras, navigation radars, and communication antennas complement its radar and EW capabilities. They allow the ship to gather intelligence, maintain situational awareness, and communicate effectively.

The **Type 055** has an edge over some Western destroyers, but the **U.S.** maintains a qualitative and quantitative advantage in high-end destroyers. Compared to the **Type 055**, the Arleigh Burke class, the **U.S. Navy's** main surface ship, displaces 9,800 tons and has 96 VLS cells, and the **Japan Maritime Self-Defense Force** Atago-class destroyers displace about 10,000 tons and also have 96 VLS. Currently, the only allied ships that can compete in size and armament are the **U.S. Navy's** Ticonderoga class cruisers with 9,600-ton displacement and 122 VLS cells, and **South Korea's** Sejong the Great class with 11,000 tons and 128 VLS.<sup>167</sup>

Japanese and South Korean destroyers equipped with the AEGIS radar system and advanced ship-to-ship missiles possess capabilities that the **Type 055** currently lacks. Even though the number of these destroyers is still relatively small, with the rapid pace of its shipbuilding industry, **China** could soon field a fleet that rivals those of Western nations. These destroyers reflect **China's** ambition to wield a formidable fleet across the world's oceans.

## 12. Conclusion:

These last few years, **China** has been launching new destroyers at a rapid pace. Over the span of seven years between 2012 and 2019, **China** launched a total of 20 **Type 052D** destroyers<sup>168</sup>. In May 2019, **China** launched 19th and 20th **Type 052D** Guided Missile Destroyer from the Dalian shipyard. In 2021, the **PLAN** saw the addition of eight Guided Missile Destroyers (four **Type 055** destroyers and five slightly smaller, more economical **Type 052DL**). In August 2022, the Dalian Shipyard and the Shanghai-based **Jiangnan Changxing Shipyard** restarted mass production of the **Type 052D** destroyer after twenty-five vessels of the same class. By the end of 2022, eight **Type 055** destroyers were in service, with additional hulls under construction. In March 2023, two **Type 052DL** class destroyers were launched from **Dalian Shipyard**. **China** currently has 49 destroyers, making it the second-largest fleet of destroyers in the world after the **U.S.**

## XI. THE PLAN'S FRIGATES

### 1. Type 01

Following the establishment of the **People's Republic of China**, the **PLAN** had an extremely limited fleet comprised mainly of outdated and ill-equipped Kuomintang ships and vessels obtained from the **U.S.** and **Japan**. To address this deficiency and modernize its navy,

<sup>167</sup> Jeffrey Lin and P.W. Singer, "China launches Asia's biggest post-WWII warship", Popular Science, 28 June 2017, <https://www.popsci.com/china-launches-asias-biggest-post-wwii-warship/>

<sup>168</sup> Xavier Vavasseur, "China Launched the 24th Type 052D, 6th Type 055 & 71st Type 056 Vessels for PLAN", Naval News, 30 December 2019, <https://www.navalnews.com/naval-news/2019/12/china-launched-the-24th-type-052d-6th-type-055-71st-type-056-vessels-for-plan/>

**China** decided to turn to the **Soviet Union** for help. Both countries signed in 1953 an agreement that facilitated the transfer of naval equipment and shipbuilding technology. The **Soviet Union** provided **China** with four kits for Riga-class frigates, which entered **PLAN** service as the **Type 01 Chengdu-class**<sup>169&170</sup>. The **Huangpu Shipyard** in Guangzhou and the **Hudong Shipyard** in Shanghai undertook the construction of the four Riga-class frigates in 1955. Under the agreement, the Soviet Union provided materials, equipment, and technical documents. There was an extensive collaboration between Chinese and Soviet experts, as well as workforce training and technology transfer. The first **Type 01** frigate, Kunming, was completed and delivered to the Chinese Navy in 1957. They served in the East China Sea Fleet of **PLAN** until their retirement in 1994. The **Type 01** represented a significant milestone in **China's** naval modernization efforts and laid the ground for the country's advancements in shipbuilding technology. The expertise gained from constructing and operating the **Type 01** frigates resulted in the subsequent development of the **Type 065** frigate.

The **Type 01** had three 100mm single-tube main guns, two 37mm double-tube naval guns, two triple 533mm torpedo launch tubes, and a 24-tube rocket-type deep-launch launcher. In the 1970s, double-mounted **SY-1** anti-ship missiles were installed to enhance their offensive capabilities.

## 2. Type 65

The **Type 065**<sup>171,172&173</sup> Jiangnan-class was the first domestically designed and built frigate in **China** following the Sino-Soviet split and the withdrawal of Soviet aid. The development of the **Type 065** frigates was initiated in the 1960s to address the urgent need for modern surface ships. These frigates provided a strategic edge to the **PLAN** over other regional naval forces. The development process for the **Type 065** began in 1962, with the first frigate, Haikou, launched in August 1966. The **Type 065** was based on the hull design of the Soviet Riga-class frigate obtained by **China** in the 1950s. The **China Ship Research Institute** was in charge of the design process in collaboration with various organizations and shipyards, including the **Shanghai Jiangnan Shipyard** and the **Guangzhou Shipyard**. They primarily served in the South China Sea Fleet and conducted coastal defense and patrol missions before being retired from active service in 1994. The **Type 065** were capable of fulfilling various maritime missions, including escort, patrol, surveillance, landing, anti-landing operations, and mine deployment.

The **Type 065** frigates were built entirely using domestic materials and equipment, marking a notable milestone in **China's** shipbuilding and naval modernization endeavors.

<sup>169</sup> "Type 01 Chengdu-class frigates", GlobalSecurity.org,

<https://www.globalsecurity.org/military/world/china/chengdu.htm>

<sup>170</sup> "Type 01 Chengdu-class – Origins", GlobalSecurity.org,

<https://www.globalsecurity.org/military/world/china/chengdu-origin.htm>

<sup>171</sup> "Type 065 Jiangnan-class Frigates", GlobalSecurity.org,

<https://www.globalsecurity.org/military/world/china/jiangnan.htm>

<sup>172</sup> "Type 065 Jiangnan-class Frigates – Program", GlobalSecurity.org,

<https://www.globalsecurity.org/military/world/china/jiangnan-program.htm>

<sup>173</sup> "Type 065 Jiangnan class frigates", Naval Encyclopedia, 29 July 2018, <https://naval-encyclopedia.com/cold-war/china/jiangnan-type-065-class-frigates.php>

Their development and deployment set the stage for **China's** progress in constructing larger and medium-sized surface combat ships.

The **Type 065** had a displacement of around 1,600 tons and had approximately a length of 91 meters, a width of 10.2 meters, and a draft of 3.16 meters. They were powered by two shafts driven by diesel engines, producing around 20,000 horsepower. The **Type 065** could achieve a maximum speed of 23 knots and had a range of 2700 nautical miles at 16 knots.

The armament of the **Type 065** frigates consisted of a mix of artillery, anti-aircraft guns, and anti-submarine weapons that allowed them to engage various threats effectively. The main armament against surface threats consisted of three 100/56mm guns. As for its anti-aircraft defense, it was equipped with eight 37mm AA twin machine guns and two 14.5mm dual-line guns. The **Type 065** was also capable of anti-submarine warfare as it had two 64-type 250mm rocket-type deep-bore launchers, four 64-type large-scale 432mm deep-bore launchers, deep-water bombs, and mines.

The **Type 065** frigates were equipped with various electronic systems and sensors such as sea-search radar, marine radar, foe identification systems, sonar systems, and command and control systems. Despite their electronics suite being considered obsolete by the 1970s, these systems played a crucial role in the frigates' effectiveness in fulfilling the **Type 065's** missions.

### 3. Type 053H

The **Type 053H**<sup>174</sup> Jianghu I frigate was domestically designed in the 1970s and was a significant evolution of **China's** goal to have ships capable of defending its territorial waters and asserting its maritime interests. The **No. 701 Institute** developed the **Type 053H** to replace older frigates. The **Type 053H** were constructed by the **Hudong Shipyard** and were primarily designed for anti-ship warfare. At least a dozen were built and entered service with the PLAN East Sea Fleet.

In terms of weaponry, the **Type 053H** were armed with a combination of anti-ship missiles, guns, and torpedo launchers. The frigates featured a single-barreled 100mm cannon as their primary gun armament, four SY-1 anti-ship missiles in two twin-missile box launchers, depth charges, and short-range ASW rockets. They had additional smaller caliber guns for anti-aircraft defense.

Regarding systems and radars, the **Type 053H** was equipped with basic but effective sensors and electronic warfare equipment for their time. They featured air and surface search radars as well as rudimentary fire control systems. The **Type 053H** lacked sophisticated command and control capabilities.

The **Type 053H** was followed by four successive subclasses (Jianghu-II through Jianghu-V).<sup>175</sup>

### 4. Type 053H1 & Type 053H2G

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<sup>174</sup> "Type 053 frigate", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_053\\_frigate](https://en.wikipedia.org/wiki/Type_053_frigate)

<sup>175</sup> "Type 053H Jianghu class Frigates (1974)", Naval Encyclopedia, 16 February 2019, <https://naval-encyclopedia.com/cold-war/china/jianghu-class-type-053h-frigates.php>

The **Type 053H1** Jianghu-II frigates represented an improvement over the **Type 053H**. It featured newer electronics, modernized turbines, and updated equipment. The notable upgrades were the installation of the **SJD-5** sonar and six **SY-2** anti-ship missiles in two triple launchers. The Zhaotong served as a prototype and featured advanced electronic systems and **PL-9C** SAMs. The first ship, Taizhou, was launched in December 1981 and commissioned in June 1982. The last one, Jishou, was launched in November 1987 and commissioned in June 1988.

The **Type 053H2G** frigates were developed in the late 1980s and represented a significant leap forward in **China's** naval capabilities. These provided the **PLAN** with a versatile frigate capable of operating in diverse maritime environments and conducting various missions such as anti-ship and anti-submarine warfare to air defense and maritime patrol.

The **Type 053H2G** frigates were equipped with a combination of anti-ship missiles, surface-to-air missiles, naval guns, and torpedo launchers that enhanced their offensive and defensive capabilities. These included the **YJ-83** anti-ship missile and **HQ-61** surface-to-air missile.

The **Type 053H2G** frigates had various radars and were also equipped with modern sensors and electronic warfare equipment. These included advanced radar systems for air and surface surveillance and fire control radars for accurately guiding their missiles and guns.

## 5. Type 053H3

The **Type 053H3**<sup>176&177</sup> Jiangwei-II frigate succeeded the **Type 053H2G** and preceded the **Type 054** frigates. Between 1996 and 2005, ten **Type 053H3** ships were constructed by **Hudong Shipyard** and the **Guangzhou Huangpu Shipyard**. The final frigate of this class, Mianyang, was launched in May 2004 and entered into service in 2006. In 2019, **China** handed over two **Type 053H3** frigates, formerly known as Lianyungang, to the **Bangladesh Navy**.

The **Type 053H3** frigate retained the hull design of the **Type 053H2G**, but it incorporated advanced weapon systems, sensors, modernized electronics, turbines, and equipment compared to its predecessor. It had a length of 114.5 meters, a beam of 12.4 meters, and a draft of 3.6 meters, with a full load displacement of 2,393 tons and a crew of 170. The frigate's propulsion system consists of a combined diesel and diesel (CODAD) unit powered by four 18E390VA diesel engines providing a maximum speed of 27 knots and a range of 4,000 nautical miles at an 18 knots speed.

The **Type 053H3** frigate weaponry includes a **Type 79A** dual-barrel 100mm gun as its main gun, two quadruple launchers capable of firing **YJ-83** anti-ship cruise missiles, the **HQ-7** surface-to-air missile system, eight **C-802** anti-ship missiles and four **Type 76A** dual-37mm anti-aircraft artillery guns. The **Type 053H3** anti-submarine warfare capabilities include two **Type 87** six-round anti-submarine rocket launchers, six torpedo tubes, and a **Harbin Z-9C** helicopter.

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<sup>176</sup> "Type 053H3 / Jiangwei II Class Frigates", Naval Technology, 24 July 2011, <https://www.naval-technology.com/projects/jiangwei-class/>

<sup>177</sup> "Type 053H3 frigate", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_053H3\\_frigate](https://en.wikipedia.org/wiki/Type_053H3_frigate)

In terms of sensors and radars, the **Type 053H3** frigate is equipped with a **Type 360** 2D air/surface search radar, a **Type 363** early warning radar, and an **RM-1290** navigation radar. It also features electronic countermeasures equipment. The **Type 053H3**'s command and control system is the indigenous **ZJK-2** which is derived from the French TAVITA. It facilitates threat evaluation, weapon allocation, engagement coordination, and weapon control.

A mid-life upgrade for the **Type 053H3** began in 2015, which included the replacement of ESM/EW suite/radars with systems from the **Type 054** and upgrades to the air defense missile system and the CIWS.

## 6. Type 053H1G

The **Type 053H1G**<sup>178&179</sup> Jianghu-V frigate was built by the **Huangpu Shipyard** in the 1990s to meet an urgent need for ships by the South Sea Fleet. With increasing challenges and tensions in the region during the early 1990s, **China** needed the capacity to patrol remote areas of the South China Sea, such as the Spratly Islands, to safeguard its maritime interests and assert its influence in the region. The **Type 053H1G** frigate addressed the limitations of existing vessels and offered an efficient solution for prolonged operations in challenging maritime environments.

It adopted the hull design and power system of the **Type 053H1** frigate and incorporated improvements from the **Type 053H2**. The frigate had upgrades to its weapon systems and living conditions for crew members. These improvements of the **Type 053H2** included air-tight cabins, a nuclear biochemical pressure defense system, central air conditioning to adapt to the humid and hot climate of the South China Sea, and an integrated combat system. There were also structural changes, such as changing the original open superstructure to a closed structure and a redesigned chimney structure with the exhaust opening facing the horizontal sides, reducing the heat signature.

The **Type 053H1G** was armed with comprehensive defense capabilities against various threats. This included double-mounted 100mm guns and eight **YJ-83** anti-ship cruise missiles in two four-box launchers. It also featured anti-aircraft artillery and anti-submarine rocket launchers.

The **Type 053H1G** was equipped with advanced radar systems, including air/surface search and fire-control radars as well as communication systems.

## 7. The Type 053H1Q

The **Type 053H1Q**<sup>180</sup> Jianghu IV frigate was a modified version of the **Type 053H** frigate. It had a crew of 185, a displacement of 1550 tons (standard) and 1860 tons (full load), a speed of 26 knots, and a range of 4000 nautical miles. The **Type 053H1Q** included a modified

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<sup>178</sup> “Jianghu-V Type 053H1G”, GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/jianghu-5.htm>

<sup>179</sup> “Type 053H1G Jianghu V class Frigate”, Seaforces.org, <https://www.seaforces.org/marint/China-Navy-PLAN/Frigates/Type-053H1G-Jianghu-V-class.htm>

<sup>180</sup> “Type 053H1Q Jianghu IV class Frigate”, Seaforces.org, <https://www.seaforces.org/marint/China-Navy-PLAN/Frigates/Type-053H1Q-Jianghu-IV-class.htm>



section to accommodate to accommodate the **Harbin Z-9** helicopter. It was armed with one **SY-1** surface-to-surface missile launcher and a 100mm gun. The **Type 053H1Q** also had anti-aircraft guns, ASW rocket launchers, and torpedo launchers. It was equipped with advanced radar and sonar systems, including air and surface search radar, fire control radar, and a hull-mounted sonar. Only one ship of this class was built, and it served to train future naval personnel.

## 8. Type 054

The Jiangkai **Type 054**<sup>181&182</sup> multi-role frigate represents a significant advancement in **China's** naval capabilities as it is the first real stealth frigate of the **PLAN** and designed to replace older **Type 053H3** frigates. Only two ships were commissioned in the **People's Liberation Army Navy Surface Force** in 2005 before the production was switched to the improved **Type 054A** frigate model. The Ma'anshan was launched in September 2003 at the **Hudong-Zhonghua Shipyard** in Shanghai and commissioned in February 2005. The Wenzhou was launched in November 2003 at the **China State Shipbuilding Corporation** in Shanghai and commissioned in September 2005. The **Type 054** was designed for a variety of mission profiles, such as escort and patrol duties, anti-piracy operations, protection of maritime interests and sea lanes, anti-submarine warfare, and search and rescue operations.

The **Type 054** had a displacement of approximately 4,000 tons and a length of around 134 meters, a beam of approximately 16 meters, and a draft of about 4 meters. The frigates were powered by a Combined Diesel and Diesel (CODAD) propulsion system. Stealth was an essential aspect of the **Type 054**. Even if it did not achieve the same level of stealth as some advanced Western counterparts, it still incorporated several design features to minimize its radar cross-section. These included angular surfaces to help deflect radar waves, extensive use of composite materials in the frigate's construction, and radar-absorbent coatings applied to the ship's surfaces. Critical sensor arrays, such as radar systems and communications antennas, were also housed in enclosed structures.

The **Type 054** frigates were armed with various offensive and defensive weapons systems designed to effectively engage air, surface, and subsurface threats. These could include the 32-launch cell **HQ-16** medium-range surface-to-air missile system designed to engage aerial threats. The **Type 054** could also carry two sets of four **C-803** subsonic anti-ship missiles for a total of eight missiles **C-803** capable of engaging surface targets at extended ranges. The **YJ-83** anti-ship missile, which could also be fitted on the **Type 054**, offers a more extended range and higher speed than the **C-803**. Close-In Weapon Systems such as the **Type 730** or **Type 1130** provided the frigates with close-range defense against incoming missiles and aircraft. The **Type 054** could also carry lightweight torpedoes to engage submarines. The frigate could also host one or two medium-sized helicopters for anti-submarine warfare, maritime surveillance, and search and rescue missions.

The **Type 054** frigate was equipped with a suite of sensors and electronic warfare systems such as phased-array radar systems for air and surface surveillance, sonar systems for

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<sup>181</sup> "Type 054 frigate", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_054\\_frigate](https://en.wikipedia.org/wiki/Type_054_frigate)

<sup>182</sup> "Jiangkai Type 054 Frigate", GlobalSecurity.org, <https://www.globalsecurity.org/military/world/china/jiangkai.htm>

anti-submarine warfare, electronic support measures (ESM) for threat detection and identification, and combat data systems for command and control.

Since their introduction in the mid-2000s, the **Type 054** multi-role frigates have evolved significantly, and upgraded versions such as the **Type 054A** and **Type 054B** frigates were introduced to meet the expanding requirements of the **PLAN**.

## 9. Type 054A

The **Type 054A** Jiangkai II frigates<sup>183&184</sup> were constructed by **Hudong-Zhonghua Shipyard** and **Huangpu Shipyard**. The **Type 054A** is an improved version of the **Type 054**, and the first ship, Xuzhou, was laid down in 2005 and entered service in 2008. Production of the **Type 054A** continues, and additional batches were commissioned in 2022 and 2023. As of 2023, a final batch of 10 ships was under development.

There are currently thirty-five active **Type 054A** Frigates that are regularly deployed in areas such as the Chinese coast, the South China Sea, the Indian Ocean, the Mediterranean Sea, and the African coast. The **Type 054A** frigates participated in anti-piracy naval patrols off Somalia and responded to regional crises, such as evacuating Chinese citizens from Libya in 2011 and Yemen in 2015. The **Type 054A** Frigates were also part of joint naval exercises with the Russian Navy in the Mediterranean and Baltic Seas.

This new class, heavily influenced by the La Fayette-class frigate from **France**, can conduct anti-air, anti-ship, and anti-submarine operations in coastal and far sea environments. The **Type 054A** frigates have a balanced anti-aircraft/anti-ship/anti-submarine configuration. They became a key component of the **PLAN**'s surface fleet by the late 2010s and the backbone of its frigate fleet. Since September 2006, on average, the two shipyards in charge of building the **Type 054A** frigate have launched a hull every four months.

The **Type 054A** has a similar stealthy to its predecessor hull design, such as a sloped hull design, radar absorbent materials, and reduced surface equipment. However, it represents a notable improvement in firepower. It became the first regional air defense frigate in service with the **PLAN**, even though it did not feature the latest naval defense technologies compared to its Western and Japanese counterparts. Each ship of the **Type 054A** class is estimated to cost around \$348 million.

The **Type 054A** frigate has a displacement of approximately 4,000 tons, a length of 134 meters, a beam of 16 meters, a draught of 5 meters, and can accommodate a crew of 165. The frigates can reach a top speed of 27 knots and reportedly travel up to 8,000 nautical miles<sup>185</sup>. It is powered by a combined diesel and diesel propulsion system composed of 16 PA6V-280 STC diesel engines<sup>186</sup>.

<sup>183</sup> “Jiangkai II Type 054A Frigate”, GlobalSecurity.org,

<https://www.globalsecurity.org/military/world/china/type-054a.htm>

<sup>184</sup> Eric Wertheim, “China’s Multipurpose FFG”, U.S. Naval Institute, Vol. 146/6/1,408, June 2020 <https://www.usni.org/magazines/proceedings/2020/june/chinas-multipurpose-ffg>

<sup>185</sup> “New Chinese Navy’s frigate Ziyang conducts live-firing exercise”, Navy Recognition, 27 October 2022, <https://www.navyrecognition.com/index.php/naval-news/naval-news-archive/2022/october/12414-new-chinese-navy-s-frigate-ziyang-conducts-live-firing-exercise.html>

<sup>186</sup> “Type 054A (Jiangkai II) Class Frigate”, Naval Technology, September 4 2020, <https://www.naval-technology.com/projects/type-054a-jiangkai-ii-class-frigate/?cf-view>

It is equipped with advanced weapons systems and sensors. These include a 32-cell vertical launching system for medium-range **HHQ-16** Surface-to-Air Missile that can engage aerial targets within a range of 50 km and the **YJ-83** sea-skimming anti-ship cruise missile that has a range of 250km. Additionally, it features two autonomous **Type 730** seven-barrel 30mm Close-In Weapon Systems (CIWS) for close-in anti-aircraft and anti-missile engagements, a single-barrel 76mm main gun. The **Type 054A** also has enhanced anti-submarine warfare capabilities and is therefore equipped with two **Type 87** six-tube 240-mm anti-submarine rocket launchers and 324mm **YU-7** torpedo launchers. In some versions of the **Type 054A** frigate, **Yu-8** anti-submarine rockets can also be launched from the same VLS as the **HHQ-16** missiles. These anti-submarine operations are expanded by the use of a **Z-9** or **Kamov Ka-28 Helix** naval helicopter. The **Type 054A2** was produced starting with the 17th unit and focused on enhanced anti-submarine warfare capability. The **Type 1130** CIWS replaced the **Type 730**, and variable depth and towed array sonar were added<sup>187</sup>.

The **Type 054A** frigate is equipped with sophisticated sensors, radars, and electronic warfare (EW) systems. The primary sensor suite is the **Type 382** Radar, a 3D air/surface search radar used to detect, monitor, and track aerial and surface targets. Complementing this is the **Type 344** Radar, optimized for target acquisition and precise fire control for surface-to-surface missile engagements. The frigate also features four **MR-90** Front Dome SAM fire control radars for its surface-to-air missile system and an **MR-36A** surface search radar for detecting and tracking surface vessels. The **Type 347G** radar facilitates fire control for the **Type 054A**'s 76mm gun. Two **Racal RM-1290** radars support navigation, and the MGK-335 medium frequency active/passive sonar system and the **H/SJG-206** towed array sonar detected underwater threats.

Other systems include electronic warfare capabilities such as missile jamming systems collectively provide detection, countermeasure, and jamming capabilities against electronic threats,

## 10. Type 054B

The **Type 054B**<sup>188&189</sup> represents a significant advancement in design and capabilities over the **Type 054A**. Despite its designation, the **Type 054B** is an entirely new frigate and marks a significant milestone for the PLAN. It further strengthens the PLAN fleet and solidifies its position as a dominant maritime force in the region. There are currently only two **Type 054B** frigates, which were launched, respectively, in August 2023 and October 2023<sup>190</sup>. There are multiple hulls under construction, suggesting confidence in the maturity of the design and readiness for large-scale procurement.

<sup>187</sup> Eric Wertheim, "China's Multipurpose FFG", U.S. Naval Institute, June 2020, <https://www.usni.org/magazines/proceedings/2020/june/chinas-multipurpose-ffg>

<sup>188</sup> Alex Luck, "China's New Type 054B Frigates Break Cover At Two Shipyards", Naval News, 15 July 2023, <https://www.navalnews.com/naval-news/2023/07/china-new-type-054b-frigates-break-cover-at-two-shipyards/>

<sup>189</sup> "Type 054B / Type 57 frigate", Global Security, <https://www.globalsecurity.org/military/world/china/type-054b.htm>

<sup>190</sup> Alex Luck, "First New Generation Frigate For Chinese Navy Launched In Shanghai". Naval News, 29 August 2023, <https://www.navalnews.com/naval-news/2023/08/first-new-type-054b-frigate-for-chinese-navy-launched-in-shanghai/>

It has a length of around 150 meters, a width of 18.5 meters, and a displacement of approximately 6,000 tons, making it approximately 50% larger than its predecessor. It maintains stealthy design features aimed at reducing radar cross-section. The **Type 054B** has a bulkier superstructure and higher bridge compared to the **Type 054A**. It appears to be powered by a gas turbine-powered, a departure from the diesel-powered **Type 054A**.

The **Type 054B** is equipped with a 32-cell vertical launch system (VLS) on the bow, but the exact type of VLS remains to be confirmed as the design and features have yet to be revealed. It is believed that it could be the universal VLS found on other Chinese destroyers or the VLS used by the **Type 054A** frigate. A notable upgrade on the **Type 054B** is the installation of a 100mm main gun, likely a modified variant of the **H/PJ-87** gun. Additionally, a **H/PJ-11** 30mm CIWS is mounted ahead of the bridge, while a **HQ-10** launcher for 24 surface-to-air missiles provides short-range air defense. Despite the absence of visible anti-ship missile launchers, there are speculations on the possibility of a second VLS or slanted ASM launchers. The **Type 054B** is also expected to host the **Z-20F** maritime helicopter, providing enhanced capabilities for anti-submarine warfare (ASW) operations and eventually operating vertical takeoff and landing (VTOL) drones.

The **Type 054B** is equipped with various advanced sensors that enhance its situational awareness and threat detection capabilities. These include a rotating active electronically scanned array (AESA) radar on the main mast that facilitates target detection and tracking across various ranges and altitudes. Additionally, the frigate has an integrated mast for electronic support measures (ESM), which enhances the ship's ability to detect and analyze electronic signals, including radar emissions, to identify potential threats and assess the electronic environment. The **Type 054B** also features anti-submarine warfare (ASW) sensors, including a bow sonar, variable-depth sonar (VDS), and provisions for a towed-array sonar (TAS) to detect and track submarines effectively.<sup>191</sup>

## XII. THE PLAN'S CORVETTES

The first ship of the **Type 056**<sup>192,193&194</sup> Jiangdao-class corvette was launched by **Hudong-Zhonghua Shipbuilding** in May 2012 and entered service in 2013. These corvettes were built in large numbers to replace several older patrol craft, corvettes, and frigates in service within the PLAN. In May 2019, the **Huangpu shipyard** located near Guangzhou in southern **China** launched the 60th corvette. This model was a variant specialized in anti-submarine warfare, called **Type 056A**. The two **Types 056** models were developed and produced independently but have slightly different configurations. The unit cost of the **Type 056** corvette is estimated to be \$200 million for the baseline **Type 056** configuration.

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<sup>191</sup> Rick Joe, "Assessing the Chinese Navy's New 054B Frigate", *The Diplomat*, 11 September 2023, <https://thediplomat.com/2023/09/assessing-the-chinese-navys-new-054b-frigate/>

<sup>192</sup> Alex Luck, "Stealthy New Warship Design Emerging At Shipyard In China", *Naval News*, 23 November 2023 <https://www.navalnews.com/naval-news/2023/11/stealthy-new-warship-design-emerging-at-shipyard-in-china/>

<sup>193</sup> Eric Wertheim, "China's Jiangdao-class Corvette: Mainstay of the First Island Chain", U.S. Naval Institute, September 2022, <https://www.usni.org/magazines/proceedings/2022/september/chinas-jiangdao-class-corvette-mainstay-first-island-chain>

<sup>194</sup> "Type 056 corvette", Wikipedia, [https://en.wikipedia.org/wiki/Type\\_056\\_corvette](https://en.wikipedia.org/wiki/Type_056_corvette)

The last **Type 056** corvette was built in December 2019<sup>195</sup>, and between 2021 and 2023, all 22 **Type 056** corvettes were transferred from the **PLAN** to the Coast Guard. This significantly enhances the Chinese Coast Guard's capabilities. The conversion of **Type 056** corvettes into Coast Guard cutters involved retrofitting work such as removing air defense and anti-ship missiles and adding LED screens and directional acoustic devices.<sup>196</sup>

72 **Type 056** and **Type 056A** variants were built across four shipyards at an average production rate of eight units per year. These corvettes represented a significant advancement in the **PLAN** maritime capabilities as they were the first modern corvettes produced by **China**. These warships specialized in coastal defense and were tailored for safeguarding operations within the first island chain. The **Type 056** corvette was designed to fill the capability gap between missile boats and frigates.

The **Type 056** corvette has a displacement of around 1,500 tons, measures 90 meters in length, 11.14 meters in width, and a draught of 4 meters. The corvettes are powered by 2 SEMT Pielstick PA6-STC diesel motors, which provide a top speed of 25-30 knots with a cruising range of 3,500 nautical miles at 18 knots.

The **Type 056** armament included a main **AK-176** 76 mm gun for surface combat, two **H/PJ-17** 30 mm autocannon for close-in defense against air and surface threats, and four **YJ-83** anti-ship missiles (AShM) for offensive capability against enemy surface vessels. Additionally, it is equipped with a **FL-3000N** surface-to-air missile launcher with eight cells for defense against aerial threats and two triple-tube 324 mm torpedo tubes for anti-submarine warfare operations. The **Type 056** also features a helipad for one **Harbin Z-9** helicopter, allowing for enhanced surveillance, reconnaissance, and search and rescue capabilities. The **Type 056A** variant, specializing in anti-submarine warfare, is equipped with advanced sensor systems such as passive towed-array and active variable-depth sonars, enhancing its capability to detect and engage enemy submarines.<sup>197</sup>

### XIII. CONCLUSION

**China's** territorial claims of sovereignty in the South China Sea<sup>198&199</sup>, rich in natural resources and fishing areas, have also antagonized its neighbors with competing claims, such as **Brunei, Indonesia, Malaysia, the Philippines, Taiwan, and Vietnam**. **China** uses the **PLAN** and its Coast Guard to impose its territorial claims in the South China Sea and challenge the presence of other claimant states and foreign navies.

<sup>195</sup> "China Builds its last and final Type 056 Corvette", Navy Recognition, January 2020, <https://www.navyrecognition.com/index.php/news/defence-news/2020/january/7945-china-builds-its-last-and-final-type-056-corvette.html>

<sup>196</sup> Liu Xuanzun, "Type 056 corvettes join China Coast Guard in law enforcement drills", Global Times, 15 September 2022, <https://www.globaltimes.cn/page/202209/1275327.shtml?id=11>

<sup>197</sup> Liu Xuanzun, "PLA Navy commissions final Type 056A corvettes specialized in coastal defense", Global Times, 17 February 2021, <https://www.globaltimes.cn/page/202102/1215722.shtml>

<sup>198</sup> "Territorial Disputes in the South China Sea", Center for Preventive Action, Council on Foreign Relations, 30 April 2024, <https://www.cfr.org/global-conflict-tracker/conflict/territorial-disputes-south-china-sea>

<sup>199</sup> "Territorial disputes in the South China Sea", Wikipedia, [https://en.wikipedia.org/wiki/Territorial\\_disputes\\_in\\_the\\_South\\_China\\_Sea](https://en.wikipedia.org/wiki/Territorial_disputes_in_the_South_China_Sea)

The **Philippines** is faced with Chinese territorial claims that overlap with its own, and the **Philippine Navy** has received assistance from allies such as the **U.S.** and **Japan** in enhancing its maritime surveillance and patrol capabilities. Following incidents elsewhere in the South China Sea in 2022 and 2023, the **Philippines** increased funding for the Navy and Coast Guard<sup>200</sup>. The country also relaunched a modernization program for its military, which included the acquisition of multirole fighter jets, radars, additional frigates, missile systems, helicopters, and the country's first submarine fleet.<sup>201</sup>

The tensions between **Vietnam** and China in the South China Sea have been escalating due to competing maritime claims. The **PLAN** and the Chinese Coast Guard have been instrumental in **China's** assertive actions in the region. **Vietnam** has strengthened ties with other countries, including the **U.S.**, to counterbalance **China's** growing influence in the region. Despite occasional efforts to de-escalate tensions, such as the recent agreements on joint patrols and fisheries incidents, the underlying territorial disputes continue to strain relations between **China** and **Vietnam** in the South China Sea.

**Japan** started providing support to Southeast Asian countries to strengthen their maritime capabilities. **Japan's Maritime Self-Defense Force (JMSDF)** is one of the most technologically advanced navies in the region, and it primarily defends the country's territory and maritime interests. Since 2022, the **JMSDF** has also enhanced maritime security around the southwestern Ryukyu Islands, including the disputed Senkaku/Diaoyu Islands in the East China Sea<sup>202</sup>.

**Malaysia** rejects **China's** claims in the South China Sea but has traditionally avoided antagonizing the country<sup>203</sup> and rarely publicizes Chinese intrusions into its EEZ. This position is mainly due to the reliance on Chinese investment and the relative weakness of the Malaysian military. Still, **Malaysia's** increasing need for oil and gas is leading to increased exploration activities in the South China Sea, bringing it into direct conflict with **China**. **Malaysia**, therefore, started increasing its military cooperation with the **U.S.**. However, **Malaysia** is wary of becoming involved in the geopolitical contest between the **U.S.** and **China** and prefers to maintain a delicate balance.

**China's** significant presence in the Indian Ocean, a vital route for its energy supplies, and its infrastructure dealing with **India's** neighboring countries, including **Bangladesh**, **Sri Lanka**, and recently the **Maldives**, has prompted **India** to enhance its naval capabilities. There has been increased investment in advanced ships, submarines, aircraft, and technology, with the navy's share of India's defense budget rising to 19%. **India**, the **U.S.**, **Australia**, and **Japan** are also part of the Indo-Pacific strategic alliance known as the Quad. The massive presence of

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<sup>200</sup> Aaron-Matthew Lariosa, "Philippines Starts Latest Naval Modernization Attempt Amid South China Sea Tensions", U.S. Naval Institute News, 28 February 2024, <https://news.usni.org/2024/02/28/philippines-starts-latest-naval-modernization-attempt-amid-south-china-sea-tensions>

<sup>201</sup> Leilani Chavez, "Philippines rethinks military modernization plan after China clashes", Defense News, 23 October 2023, <https://www.defensenews.com/global/asia-pacific/2023/10/23/philippines-rethinks-military-modernization-plan-after-china-clashes/>

<sup>202</sup> "Senkaku Islands dispute", Wikipedia, [https://en.wikipedia.org/wiki/Senkaku\\_Islands\\_dispute](https://en.wikipedia.org/wiki/Senkaku_Islands_dispute)

<sup>203</sup> Rebecca Tan, "Malaysia's appetite for oil and gas puts it on collision course with China", The Washington Post, 11 May 2024, <https://www.washingtonpost.com/world/2024/05/11/china-malaysia-south-china-sea/>

the **PLAN** in the South China Sea is a major concern, as 60% of **India**'s cargo passes through the shipping lanes in the region. **India** has also significantly increased its involvement with countries in the South China Sea. These include joint military exercises, enhancing defense cooperation, and providing military assistance. Still, India's priority remains to maintain dominance in the Indian Ocean.<sup>204</sup>

The **U.S. Navy**., the **Royal Navy**, and the **Royal Australian Navy** are active in the South China Sea as part of their strategies to maintain freedom of navigation, uphold international law, and support regional allies and partners. They continue to conduct regular freedom of navigation operations and joint exercises with regional allies. China has called these actions provocative and destabilizing.

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<sup>204</sup> Nian Peng, “*India's Growing Involvement in the South China Sea Disputes*”, *The Diplomat*, 10 November 2023, <https://thediplomat.com/2023/11/indias-growing-involvement-in-the-south-china-sea-disputes/>