CHINA-U.S. NAVAL BUILD-UP AND EMERGING BALANCE OF POWER IN INDO-PACIFIC

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Abstract

The article highlights fast track naval build-up by China and United States which is imparting transformative impact on the power dynamics of Indo-Pacific region. Rapid production of naval vessels by China's industrial complex has turned People Liberation Army Navy (PLAN) into largest navy in the world. However, United States Navy (USN) still dominates PLAN in terms of qualitative advantage and net-tonnage as superior technological systems are being employed by U.S. Navy's bigger and more capable naval vessels. This article provides detailed overview of current strength of PLAN and U.S. Navy as well as their on-going and near-future modernization programs. These modernization programs cover the surface, sub-surface, and aerial domain. The article also provides analysis how these advancements will enhance their combat capability with respect to emerging threat environment in Indo-Pacific region. Using theoretical lens of Balance of Power (BoP) theory, the article predominately focuses on naval prowess to gauge the relative strength of both nations. However, it also incorporates and briefly discusses other important parameters including differences in strategies being employed, role of geographical factor, and formulation of new alliances and security arrangements by Washington like AUKUS and Quad, and their efficiency particularly from when compared with NATO's example. The analysis concludes by assessing the impact of these factors on the evolving balance of power in the Indo-Pacific, and how balance of power in Indo-Pacific is likely to change depending upon future trajectories of China and U.S. force modernization drive.

Key Words: People Liberation Army Navy (PLAN), United States Navy (USN), Info-Pacific Region, Naval Build-up, Balance of Power

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1. Introduction

China's rise as a major power is redefining the global geopolitical order. China is actively pursuing ambitious projects like the Belt and Road Initiative (BRI), aiming to enhance its influence through infrastructure development and economic partnerships at global scale. Over the past few decades, China's economic prowess has translated into substantial military advancements, with a particular focus on expanding and strengthening its naval capabilities. The construction and militarization of artificial islands in South China Sea, and growing friction with Taiwan, underscore Beijing's intension to assert its territorial claims in strategically important regions. These developments signify China's strategic intent to project power, protect its extended maritime interests, and secure critical sea line of communication (SLOCs) which in turn is reflection of a broader strategy to extend Beijing's sphere of influence.

The United States perceives China's growing influence as a major threat to its long-standing hegemony – particularly in the Indo-Pacific region. For decades, the U.S. has maintained a significant influence in the region. However, Washington fears that Beijing's expanding footprint – both economic and military, can undermine the economic and strategic architecture that has supported U.S. led order in the Indo-Pacific region. Therefore, Washington is following a multi-faceted strategy involving modernization of its military capabilities – particularly United States Navy (USN) and establishment of strategic alliances with key regional players.[1]

2. Indo-Pacific from Balance of Power Theoretical Lens

Balance of Power (BoP) is one of the key subsets of the Realist school of thought and has been defined in several ways. Classical or traditional realist scholars such as Hans J. Morgenthau have argued that balance of power is a state of affairs in which power is distributed among several nations with roughly equal strength, preventing any one nation from dominating the others.[2] Palmer and Perkins has described the balance of power as a system of countervailing pressures and shifting alliances that prevent any one state or coalition from becoming so powerful that it can dominate others.[3] According to them the balance of power functions as a stabilizing force in international relations by ensuring that no single state or group of states can upset the equilibrium necessary for global security.

Morgenthau, while taking a traditional realist perspective and its emphasis on human beings dictating the drive for domination and power, argues that the balance of power can mitigate this behavior and will subsequently ensure the order and stability of the international system. According to him, the balance of power and its resultant policies aimed at the establishment and maintenance of order are deemed quintessential for

[1] Ahmad, I., & Khan, M. A. (2024). Great power rivalry in Indian Ocean: Implications and options for Pakistan. *Academic Journal of Social Sciences, 8*(1), 77–78.

[2] Morgenthau, H. J. (1985). *Politics among nations: The struggle for power and peace* (6th ed.). McGraw-Hill.

[3] Palmer, N. D., & Howard, C. P. (1969). *International relations: The world community in transition* (3rd ed.). Houghton Mifflin.

international political stability. However, his core argument is that the balance of power is a consequence of the struggle for power in which states primarily intend to acquire superiority rather than the explicit establishment of a balance of power.

On the other hand, Neo-realists such as Kenneth Waltz have developed the balance of power as a refined theoretical approach in a systematic and consistent manner. According to Waltz, the international system is inherently anarchic, in which states must rely on self-help to ensure their survival. This leads to a natural tendency among states to balance against more powerful actors to prevent any one state from achieving overwhelming dominance. Waltz argues that this balancing behaviour is a structural consequence of the international system itself, rather than a deliberate policy choice by states. He emphasizes that the balance of power is not a result of conscious efforts to create equilibrium but is rather an outcome of states pursuing their own security in an anarchic world.[4]

According to neorealism, there are two key ways of balancing: internal balancing and external balancing. The former implies channeling the resources of states for increasing military capacity, prevention of internal crisis, and effective organization of the state in order to strengthen and safeguard oneself for competing in an effective manner. As far as external balancing is concerned, it deals with the formulation of alliances with the purpose of stopping a rising power. Waltz argues that despite the difficulty with respect to state collaboration, the emergence of existential or common threats leads states group together against a threatening-cum-dominating state.[5]

Sino-U.S. power struggle in the Indo-Pacific region reflects the applicability of balance of power theory. Beijing and Washington are engaged in mutual competition to expand their influence while undermining that of adversary in the process. China's rapid expansion of economic infrastructure, growing dependency on sea-lanes for trade, massive development of naval fleet, territorial issues with Japan and Taiwan, and militarization of artificial island to assert claims in disputed South China Sea, all accounts for Beijing's growing influence. As a counterbalance, U.S. is strengthening its naval prowess, increasing forward presence, and developing alliances with other major players. Initiative like Quad, AUKUS, and bilateral strategic agreements with India also represents Washington's power balancing measure against rising China. The most eminent aspect is rapid naval expansion by both China and United States to achieve naval superiority over each other.

3. People's Liberation Army Navy (PLAN): Current Strength and Modernization

People's Liberation Army Navy (PLAN) has undertaken remarkable expansion and technological improvements in recent years. With 355 naval platforms operational, plan is

[4] Waltz, K. N. (1979). *Theory of international politics*. Addison-Wesley.
[5] Andersen, M. S. (2018). Balance of power. *Norwegian Institute of International Affairs*. https://doi.org/10.1002/9781118885154.dipl0339

currently the largest navy in terms of number of ships.[6] However, majority of these ships are smaller in size when compared with American counterparts. Therefore, in terms of tonnage, PLAN is still two times smaller than United States Navy (USN). This tonnage gap, albeit, is rapidly shrinking since China is now producing heavier warships at much faster rate compared to United States.

Plan currently operates two aircraft carriers, *Liaoning* and *Shandong*. *Liaoning* was acquired from Ukraine in 1998 and was refurbished into carrier vessel. It is conventionally powered, with an estimated full load displacement of 60,000 to 66,000 tons, and can reportedly accommodate an air wing of 30 or more fixed-wing airplanes and helicopters. *Shandong* is domestically produced modified version of the *Liaoning* design and can operate a larger air wing of 40 aircrafts. Its displacement is estimated at 66,000 to 70,000 tons. Both utilize short take-off, barrier-arrested recovery (STOBAR) system for conducting carrier aviation operations.[7] Use of ski-jump significantly reduces the combat capability of both carriers.

To compensate this capability gap, China has produced *Fujian* flat-top aircraft carrier which features Electromagnetic Aircraft Launch System (EMALS). EMALS improves carrier operations by allowing more efficient, smoother, and flexible aircraft launches thereby improving the sortie rate and minimizing maintenance requirements. The 80,000 tons carrier is being equipped with niche technologies and will accommodate aviation wing of approximately 80 aircrafts including J-35 stealth aircrafts, fixed wing KJ-600 Airborne Early Warning (AEW) aircrafts, Z-20 anti-submarine warfare (ASW) helicopters, and drones of varying capabilities.[8]

Plan surface fleet comprises of mixture of new and aging naval vessels. Besides gradually phasing out obsolete platforms, China is also upgrading mid-tier warships with new sensors and weapon systems. In parallel, PLAN is commissioning new generation of modern and heavier warships equipped with cutting edge combat capabilities.

The largest and most capable warship in PLAN disposal is Type-055 *Renhai* class heavy destroyer. Displacing more than 12,000 tons, this warship is categorized as cruiser by United States. Equipped with 112 vertical launch tubes, these destroyers are armed with wide array of missile systems including HHQ-09 long-range SAM, YJ-21 hypersonic missile, and YJ-18 supersonic missile.[9] Currently eight warships are operational with more in various phases of production.[10] Type-052D/DL *Luyang-III* class destroyer, with 7500

[6] Congressional Research Services. (2022, January 20). China naval modernization: Implications for U.S. Navy capabilities—Background and issues for Congress. *Congressional Research Service Report*, 5.

[7] International Institute for Strategic Studies (IISS). (2024). *The Military Balance 2024* (pp. 19–20).

[8] Dahm, J. M., & Singer, P. W. (2024, June 6). China's latest aircraft carrier is much more than a big ship. *Defense One*. https://www.defenseone.com/ideas/2024/06/chinas-latest-aircraft-carrier-much-more-big-ship/397188/

[9] Wertheim, E. (2023, March). Type-55 Renhai class cruiser: China's premier surface combatant. *U.S. Naval Institute Proceedings*. https://www.usni.org/magazines/proceedings/2023/march/type-055-renhai-class-cruiser-chinas-premier-surface-combatant

[10] Luck, A. (2024, May 28). China launches 10th Type-055 vessel. *Naval News*. https://www.navalnews.com/naval-news/2024/05/dalian-shipbuilding-launches-type-055-increases-production-at-dagushan/

tons displacement, is the most prolific destroyer in PLAN fleet. With 25 examples operational and more hulls in production, these destroyers are equipped with 64 VLS and carry similar weapon systems as Type-055.[11] Six ships of its predecessor class, called Type-052C *Luyang-II*, are also operational.[12] Beside this, numerous older generation destroyers, after necessary upgrades, are in active service with PLAN.

Plan has large inventory of frigates of varying capability. With 39 ships deployed, Type-54A *Jiangkai-II* class frigate is currently the most capable and most abundant frigate in PLAN inventory. These 4200 tons frigates have multi-mission capabilities but are primarily configured for ASW duties. After Type-054A, China has launched new 5000 tons heavy Type-054B class frigate which will carry more advance sensors and weapon systems and will replace outdated frigates in PLAN arsenal.[13] Beside destroyers and frigates, PLAN operates large fleet of corvettes and missile boats which are designed for littoral operations. Type-056A *Jiangdao* ASW corvettes and Type-22 *Houbei* class FACM account for a substantial share of PLAN surface fleet.

Plan underwater fleet, comprising of conventional as well as nuclear submarines, has been modernized and expanded in recent years. Currently, bulk of PLAN submarine fleet consists of conventionally powered submarines – including submarines equipped with Air Independent Propulsion System (AIP). Standard conventional submarines fleet consists of 08 improved *Kilo* class, 12 Type-39G *Song* class, and 04 vintage Type 35 *Ming* class submarines.[14] While AIP equipped submarine fleet comprise of 20 Type-39A/B/C *Yuan* class submarines.[15] China has recently launched Type-39C class of AIP equipped submarine which is being mass produced to replace obsolete non-AIP submarines. U.S. Department of Defense estimates that 42 Type-39 A/B/C *Yean* class submarines will be operation in PLAN by 2025.[16]

Plan nuclear submarine fleet is relatively moderate in size. Two Type-093 *Shang* class and four Type-093A *Shang-II* class SSNs are currently operational with three Type-91 *Han* class SSNs in active reserve.[17] Sea-based second strike capability is provided by six Type-94 *Jin* class SSBN each armed with 12 JL-02 SLBMs providing strike range of 7,000kms.[18]

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[11] Ozburk, T. (2023, March 12). China launches two more Type-52DL destroyers in Dalian. *Naval News*. https://www.navalnews.com/naval-news/2023/03/china-launches-two-more-type-052dl-destroyers-in-dalian/

[12] Sea Forces. (n.d.). Type-52C Luyang-II class guided missile destroyer. *Sea Forces*. https://www.seaforces.org/marint/China-Navy-PLAN/Destroyers/Type-052C-Luyang-II-class-DDG.htm

[13] Luck, A. (2024, January 18). Chinese Navy next-generation frigate starts builder trials. *Naval News*. https://www.navalnews.com/naval-news/2024/01/chinese-navy-next-generation-frigate-starts-builder-trials/

[14] International Institute for Strategic Studies (IISS). (2024). *The Military Balance 2024* (p. 256).

[15] International Institute for Strategic Studies (IISS). (2024). *The Military Balance 2024* (p. 256-257).

[16] Sutton, H. I. (2021, July 8). Chinese Navy's latest Type-39C Yuan class. *Covert Shores*. http://www.hisutton.com/Chinese-Type-039C-Yuan-Class-Submarine.html

[17] International Institute for Strategic Studies (IISS). (2024). *The Military Balance 2024* (p. 256).

[18] Rajagopalan, R. P. (2023, October 31). China's growing submarine capabilities. *The Diplomat*. https://thediplomat.com/2023/10/chinas-growing-submarine-capabilities/

China is also steadily replacing older nuclear attack and nuclear ballistic submarines with newer versions. PLAN is working to develop new class of nuclear attack submarine, designated Type-95, which will be equipped with VLS tubes for launching submarine launch cruise missiles (SSCMs). The induction of SSGNs will essentially enhance the operational flexibility of PLAN's nuclear attack submarine fleet. Similarly, Beijing's future sea-borne assured second strike capability will be structured on next generation SSBN, designated Type-096. These SSBNs will be integrated with new JL-03 SLBM which will provide estimated strike envelop in excess of 10,000kms and will be capable of delivering multiple-nuclear warhead per missile.[19] Estimates suggest that PLAN underwater fleet will grow to 76 submarines by 2030 including 08 SSBNs, 12 SSNs/SSGNs, and 55 SSKs/SSPs.[20]

China's is augmenting its amphibious warfare potential by commissioning more and bigger amphibious warfare vessels. Beside numerous small landing ship transport (LST) vessels, China has commissioned eight Type-71 *Yuzhoo* landing platform dock (LPD).[21] These 20,000 ton warships can carry amphibious missions by employing marines through watercrafts as well as rotary-wing aircrafts. More importantly, four Type-75 *Yushen* landing helicopter docks (LHDs) have been put into service in recent years.[22] Displacing approximately 40,000 tons, these vessels can deploy dozen rotary-wing aircrafts and landing crafts, and also function as command and control vessels for large scale amphibious operations. Follow up and even more capable LHD, designated Type-76 LHD, is in developmental phase.[23] Acting as mini-aircraft carrier, this LHD class will reportedly be equipped with EMALS for manned and unmanned fixed-wing aircrafts and will act as crucial asset for regional power projection.

Beside warships, submarines, and aircrafts, land based anti-ship ballistic missiles (ASBMs) can also be prominently featured in China's A2/AD strategy. DF-21D and DF-26 are road mobile ASBMs with ranges of 1,500km and 4,000kms respectively. These missiles serve as additional layer of China's A2/AD envelop, enhance PLAN's defensive perimeter and serve as deterrent against potential adversaries in the Western Pacific.[24]

China's naval modernization reflects a comprehensive and strategic effort to transform its navy into a formidable blue-water force capable of protecting its expanding maritime interests. PLAN technological developments have significantly enhanced its operational range, power projection, and combat readiness. As China continues to invest in its naval capabilities, it is poised to play a more influential role in regional and global

[19] Caggiano, L. (2023, May). China deploys new submarine-launched ballistic missile. *Arms Control Association*. https://www.armscontrol.org/act/2023-05/news/china-deploys-new-submarine-launched-ballistic-missiles

[20] Congressional Research Service. (2022, November 10). China naval modernization: Implications for U.S. Navy capabilities. *Congressional Research Service*, 15.

[21] International Institute for Strategic Studies (IISS). (2024). *The Military Balance 2024* (p. 257).

[22] International Institute for Strategic Studies (IISS). (2024). *The Military Balance 2024* (p. 257).

[23] Luckm A. (2024, June 17). Type-76 amphibious carrier takes shape in Shanghai. *Naval News*. https://www.navalnews.com/naval-news/2024/06/type-076-amphibious-carrier-takes-shape-drone-airwing-emerges/

[24] Filipoff, D. (2023, May 01). China's anti-ship firepower and mass firing scheme. *CIMSEC.* https://cimsec.org/fighting-dmo-pt-8-chinas-anti-ship-firepower-and-mass-firing-schemes/

maritime security dynamics, challenging the traditional naval superiority of United States and potentially redefining the strategic calculus of the Indo-Pacific region.

4. United States Navy (USN): Current Strength and Modernization

The United States Navy (USN) is most advanced navy in the world and operates a diverse fleet that includes nuclear powered aircraft carriers, nuclear submarines, destroyers, and amphibious assault ships, along with a growing number of unmanned vessels. USN currently operates 296 warships of all types and is structured into six fleets.[25] Designed for power projection on global scale, U.S. Navy is the largest navy in world when net-tonnage is taken into account.

The U.S. Navy aims to expand its fleet to as many as 523 ships, comprising 373 manned and 150 unmanned vessels.[26] However, the likelihood of achieving a fleet of this size is quite low. On average, it takes 10-15 years for a new class of ship to progress from the design phase to deployment.

U.S. Navy currently operates 11 nuclear powered air craft carriers. Existing Nimitz class aircraft carriers are gradually being replaced by Ford class aircraft carriers. Unlike Nimitz class, Ford class incorporates cutting edge technologies including Electromagnetic Aircraft Launch System (EMALS) and advanced arresting gear which significantly improves aircraft launch and landing mechanisms. These carriers serve as the centrepiece of the US Navy's power projection capabilities, enabling rapid deployment of air assets globally, supporting military operations, and serving as effective tool of naval diplomacy.

The U.S. carrier aviation has witnessed significant improvement in recent decades. Each carrier aviation wing comprising of fifth generation F-35B stealth aircrafts, advance blocks of F/A Super Hornet fighter aircrafts, E/A-18G Growler electronic warfare (EW) aircrafts, E-2D Hawkeye airborne early warning (AEW) aircrafts, and MH-60 SeaHawk ASW helicopters, provides formidable multi-spectrum combat capability. Additionally, carrier based drones, like MQ-25 Stingray are being deployed from flat-tops to serve as unmanned tanker as well as ISR asset.[27]

Although U.S. Navy is undertaking multi-domain modernization but its surface fleet modernization efforts have suffered numerous set-backs in past decade. The failure of Zumwalt stealth destroyer program and Littoral Combat Ship (LCS) program has undermined U.S. drive to expand the number of warships by and replace older hulls. Under Zumwalt program, USN was planning to commission 32 warships equipped with

[25] Congressional Research Service. (2022, November 10). China naval modernization: Implications for U.S. Navy capabilities. *Congressional Research Service*, 7.

[26] LaGrone, S. (2022, July 26). Navy's Force Design 2045 plans for 373-ship fleet, including 150 unmanned vessels. *USNI News*. https://news.usni.org/2022/07/26/navys-force-design-2045-plans-for-373-ship-fleet-150-unmanned-vessels

[27] Newdick, T. (2021, December 2). Navy's MQ-25 Stingray tanker drone goes aboard a carrier for the first time. *The War Zone*. https://www.twz.com/43361/navys-mq-25-stingray-tanker-drone-goes-aboard-a-carrier-for-the-first-time

futuristic technologies.[28] However, higher cost and reliability concerns regarding weapon systems compelled U.S. Navy to reduce the total order to mere three warships.[29]

Similarly, United States' Littoral Combat Ships program, consisting of Freedom class and Independence class warships, has also failed to meet the intended objectives. These two different classes of multi-mission warships are modular design and could be equipped with varying mission module depending upon mission requirement. In total, 35 warships consisting of 19 Independence class and 16 Freedom class were planned with option of more batches. However, both classes of LCS have suffered from propulsion issues, structural failures, high maintenance costs and poor availability rate. Similarly, the revolutionary modular design also has proven to be too complicated to be practical. These factors have compelled U.S. Navy to pre-maturely retire LCS warships.[30] The phasing out of LCS fleet has reduced overall numerical strength of U.S. Navy.

To compensate aforementioned programs failures, USN has initiated Constellation class frigate program for producing 20 advance multi-mission frigates.[31] Based on proven design, these frigates are meant to restore numerical gaps while providing next generation combat capabilities. However, construction of very first Constellation class frigate is already three years behind schedule.[32] Issues like increment in weight and design instability has compromised the delivery timeline of entire program.[33] Similarly, DDG(X) program, directed to serve as replacement of Ticonderoga class cruisers and old Arleigh Burke class destroyers, will materialize only in late 2030s.[34] In parallel, USN will continue to commission advance version (flight-III) of Arleigh Burke class destroyers which currently constitute the backbone of US Navy surface fleet.[35]

U.S. Navy submarine force purely comprise of nuclear submarines. Currently, 50 nuclear attack submarines (SSNs), 04 nuclear cruise missile submarines (SSGNs), and 14 nuclear ballistic missile submarines (SSBNs) are operational in USN. Ohio class SSBNs, each equipped with 20 Trident D-5/D-5LE Submarine Launch Ballistic Missiles (SLBMs), constitute the sea-leg of US nuclear triad and provides assured second strike

[28] Congressional Research Service. (2022, August 26). Navy DDG-51 and DDG-1000 destroyer program: Background and issues for Congress. *Congressional Research Survey*, 24. https://sgp.fas.org/crs/weapons/RL32109.pdf

[29] Congressional Research Service. (n.d.). Navy DDG-51 and DDG-1000 destroyer program. *Congressional Research Survey*, 24–27.

[30] LaGrone, S. (2022, March 29). All Freedom littoral combat ships in commission tapped for early disposal. *USNI News*. https://news.usni.org/2022/03/29/all-freedom-littoral-combat-ships-in-commission-tapped-for-early-disposal

[31] LaGrone, S. (2018, February 16). Navy picks five contenders for next-generation frigate program. *USNI News*. https://news.usni.org/2018/02/16/navy-picks-five-contenders-next-generation-frigate-ffgxprogram

[32] Shelbourne, M. (2024, April 3). Constellation frigate delivery delayed three years. *USNI News*. https://news.usni.org/2024/04/02/constellation-frigate-delivery-delayed-3-years-says-navy

[33] Trevithick, J. (2024, May 30). Navy's new Constellation-class frigate is a mess. *The War Zone*. https://www.twz.com/sea/navys-new-constellation-class-frigate-is-a-mess

[34] LaGrone, S. (2024, January 10). Navy wants three-year overlap between Arleigh Burkes and DDG(X). *USNI News*. https://news.usni.org/2024/01/10/navy-wants-3-year-overlap-between-arleigh-burkes-and-ddgx-considering-propulsion-system

[35] Shelbourne, M. (2022, April 25). Navy puts forth 9-ship multi-year deal for Arleigh Burke destroyers. *USNI News*. https://news.usni.org/2022/04/25/navy-puts-forth-9-ship-multi-year-deal-for-arleigh-burke-destroyers

capability.[36] Additional four Ohio class submarine have been modified to carry tomahawk cruise missiles. Three classes of nuclear attack submarines including Virginia, Seawolf, and Los Angeles, are operational with duties including destroying enemy vessels, supporting carrier operations, and undertaking surveillance.[37]

U.S. Navy is developing next generation submarines and in parallel also up-arming its submarine fleet with more capable weapon systems. Colombia class SSBN project is underway to fully replace aging Ohio class SSBNs by 2042. In total, 12 Colombia class SSBNs are planned and project has been regarded as top-priority by USN since 2013.[38]

Beside induction of new vessels, U.S. Navy is replacing its traditional missile systems with superior examples. Harpoon anti-ship missile is being replaced by Naval Strike Missile (NSM) which offers better range, advance targeting capability, and stealth characteristics. Tomahawk Block-V cruise missile also offers significant improvement over older versions in terms of precision, range, guidance system, payload modularity, and low-observability.

In the domain of hypersonic missiles, U.S. Navy has plans to equip its three Zumwalt destroyers and twenty Virginia class SSNs with Conventional Prompt Strike (CPS) hypersonic missiles by 2025.[39] Hypersonic missiles, when launched from stealth platform, will provide unmatched combat potential. It will enhance U.S. Navy's ability to conduct high-speed, long-range strikes potential while providing advantage associated with element of surprise, low observability, and survivability in parallel. The integration of next generation missile systems will not only strengthen the US Navy's naval warfare capabilities but also aligns with broader U.S. military objectives to maintain a technological edge and ensure strategic superiority in an increasingly contested maritime domain.

5. Comparative Assessment of Naval Forces and Related Factors

Plan, supported by China's vast industrial complex, has produced more naval vessels than any other nation in past decade. As discussed before, PLAN currently operates largest number of naval vessels in world. However, unlike U.S. Navy, majority of PLAN vessels are smaller in size. Therefore in terms of net-tonnage, U.S. Navy displaces 4.5 million tons, while PLAN displaces 2.0 million tons.[40] But U.S. Navy has to maintain and protect its interests at the global scale. This dilutes U.S. Navy ability to concentrate overwhelming combat prowess against China. On flip side, China can direct its entire fleet

[36] NTI. (n.d.). United States. *NTI*. https://www.nti.org/countries/united-states/

[37] NTI. (2024, March 6). United States submarine capabilities. *NTI*. https://www.nti.org/analysis/articles/united-states-submarine-capabilities/

[38] Congressional Research Service. (2024, February 16). Navy Columbia (SSBN-826) class ballistic missile submarine program: Background and issues for Congress. *Congressional Research Service*. https://s3.documentcloud.org/documents/24434027/report-to-congress-on-columbia-class-ballistic-missile-submarine-program-feb-16-2024.pdf

[39] Axe, D. (2022, November 20). The U.S. Navy is about to pack hypersonic missiles into its new stealth destroyers. *Forbes*. https://www.forbes.com/sites/davidaxe/2022/11/20/the-us-navy-is-about-to-pack-a-dozen-hypersonic-missiles-apiece-into-its-new-stealth-destroyers/

[40] Marrone, A., & Calcagno, E. (2023). Naval combat systems: Development and challenges. *Istituto Affari Internazionali*, 21; 32.

in its immediate maritime neighbourhood. This significantly strengthens PLAN position against U.S. Navy as it can numerically overwhelm U.S. forces' qualitative superiority.

It's worth noting that China is now mass producing larger vessels with heavier tonnage and superior weapon systems, and is narrowing down the qualitative gap against American counterpart. China has already switched to medium STOBAR carriers to bigger and more capable CATOBAR carriers. Next generation LHDs, destroyers, and frigates, all are bigger in size and weapon load capacity than current generation counterparts. Additionally, Chinese shipyards have much higher production rate than American shipyards. Combine all these factors, it can be predicted that PLAN will be in dominant position in Indo-Pacific in coming years. A comparative account of major warships operated by both navies is given below.

Table 5-1 Numeric Comparison of Major Naval Vessels of Current PLAN and U.S. Navy [41]

Naval Vessel Type	**People's Liberation Army Navy (PLAN)**	**United States Navy (USN)**
Nuclear Powered Aircraft Carrier (CVN)	00	11
Conventional Powered Aircraft Carriers (CV)	02	00
Landing Helicopter Dock (LHDs)	03	09
Landing Platform Dock (LPDs)	08	22
Cruisers (CG)	08	15
Destroyers (DDGs)	42	73
Frigates (FFGs)	49	00
Corvettes/Littoral Combat Ships (FFLs/LCS)	50	23
Conventional Submarines (SSK)	46	00
Nuclear Attack Submarines (SSNs/SSGNs)	06	52
Nuclear Ballistic Missile Submarines (SSBNs)	06	14

Despite a favourable future outlook, the contemporary deficiencies on PLAN part cannot be ignored at all. Perhaps the biggest limitation is lack of experience regarding modern naval warfare in general and blue water operations in particular. U.S. Navy has rich history of employing aircraft carriers and other assets with synergy. Such learning is either derived from exercises or is purely theoretical in case of China. Beside gaps in experience in planning and training, Chinese naval systems are also not combat proven. Although PLAN has deployed naval warships for low-end threats like piracy and traffickers, but no Chinese vessel has ever seen high-mid intensity conflict in modern era. This suggests that PLAN growing might is untested and has high probability of suffering from unintended setbacks during conflict. China has taken measures to overcome these key deficiencies. Participation in joint exercises with allies, use of high-end tools like artificial intelligence (AI) and machine learning (ML) to better plan and execute training and planning can help to mitigate such gaps to considerable extent.[42]

[41] International Institute for Strategic Studies (IISS). (2024). *The Military Balance 2024*. For PLAN: 256–259; For USN: 39–53.

[42] Bresnick, S. (2024, April 3). China bets big on military AI. *CEPA*. https://cepa.org/article/china-bets-big-on-military-ai/

Beside numeric or tonnage comparison of both navies, there are numerous other factors which should be taken into account. Foremost, it's important to understand that Indo-Pacific theatre – characterized by maritime domain, is very different from that of Cold War's theatre which was predominately continental in nature. Indo-Pacific is about sea-control and sea-denial strategies where synergy between all dimensions of forces in maritime domain is required.

By design, sea-denial strategies are easier to employ than sea-control strategies.[43] Sea-denial focuses on preventing and deterring adversary from using specific maritime areas using assets like anti-ship missiles, submarines, and mines. China has invested heavily in this regard by developing multiple layered A2/AD network comprising of land based anti-ship ballistic missiles, MPAs equipped with long-range missiles, long-range supersonic and hypersonic missiles, and multi-range air-defense systems. This A2/AD network is supported by robust intelligence surveillance and reconnaissance (ISR) systems consisting of satellites, manned Airborne Warning and Control System (AEWCs), Electronic Intelligence (ELINT) aircrafts, radars, and drones linked together via data-link and centralized command & control (C&C) system.

In contrast, U.S. Navy is historically designed and operated for sea-control missions. Therefore, it needs much superior capability to successfully breach sea-denial envelop of China, sustain presence in increasingly complex and threatening environment, and achieve requisite objective without suffering unbearable losses. This necessitates a more extensive and technologically advanced fleet, which is far more resource-intensive. U.S. has invested significantly in this regard. Besides producing more and superior naval vessels, numerous other measures are being taken. United States is answer to China's A2/AD strategy is multi-domain operations and archipelagic defense, aiming to penetrate and disintegrate the enemy's A2/AD system to exploit the benefits of the regained freedom of movement to establish a favorable environment for the U.S. forces.[44] Measures like operationalization of F-35 B/C stealth aircrafts from aircraft carriers as well as LHDs, augmentation of ship-borne air-defense systems, strengthening of network centricity, advancement in early-warning systems, introduction of carrier-based drones, employment of low-radar signature cruise missiles, development of hypersonic missiles, standardization of long-range tilt-rotor crafts, proliferation of unmanned surface and underwater vessels, raising of forwards military bases on friendly nations, and improvement in logistical network are one of the few important examples in this regard.

One common attribute between Cold War model and contemporary Indo-Pacific model is the *containment strategy* of United States. Just like U.S. strategy of containing Soviet Union by encircling it with allies and off-shore military bases, Washington is attempting to restrict China within first island chain in Indo-Pacific. First island chain stretches from Japan to Taiwan and eventually leads to South China Sea. Another chain, known as, second island chain, runs from Japan to Guam and ends at Indonesia. These

[43] Chang, C. (2018, September 12). Nature of sea denial and sea control strategies. *CIMSEC*. https://cimsec.org/the-nature-of-sea-control-and-sea-denial/

[44] Meraner, F.-L. R. (2023, February 9). China anti-access/area denial strategy. *TDHJ*. https://tdhj.org/blog/post/china-a2ad-strategy/

chains represent physical barrier within which United States want to contain China's military forces in general and PLAN in particular. Washington is deepening military relations with Western Pacific nations to increase their military capability and also station U.S. forces and military infrastructure.[45]

Beside naval modernization, a concurrent approach followed by United States is formulation of alliances and establishment of security arrangements. Quadrilateral Security Dialogue (Quad), established in 2007, now provides an informal platform for mutual collaboration between United States, Japan, Australia, and India. Although not a military alliance, Quad has played important role in deepening military co-operation among all four nations as is evident in collective participation of Quad nations in Malabar exercises.[46] AUKUS, a trilateral security arrangement between Australia, United States, and United Kingdom, for providence of eight nuclear attack submarines (SSNs) and other modern military hardware to Australia, is key example how Washington is up-arming its regional alias for counterbalancing China.[47] Furthermore, the defensive posture of Japan is gradually incorporating offensive capabilities with the support of United States.[48] Similarly, Indo-U.S. bilateral security agreements like LEMOA, COMCASA and BECA, are directed to enhance logistics support, communication comparability, intelligence sharing, and procurement of high-end military technologies.[49] By formulating such militarized alliances and security arrangements, Washington seeks to collectively counter Chinese expansion and retain U.S. dominated balance of power in the Indo-Pacific region.

The Indo-Pacific related alliances and arrangements have numerous key shortcomings and thus cannot be regarded equivalents of NATO. Unlike Article-V of NATO treaty, there is no clause of collective defense in any Indo-Pacific specific agreement conducted by United States. Thus, there is no legal binding for any Washington or its allied nation to commit for collective defense and support each other directly though military means in case of crisis with China. As a result, these alliances are more about strategic alignment and regional stability rather than a binding defense pact, limiting their deterrence power compared to NATO in the context of the Indo-Pacific naval competition.[50]

Another major shortcoming is limited compatibility in terms of military training, doctrines, equipment, and operational arts between U.S. forces and its Indo-Pacific allies.

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[45] Brands, H., & Cooper, Z. (2024, March 12). Dilemmas of deterrence: United States' smart new strategy has six daunting trade-offs. *CSIS*. https://www.csis.org/analysis/dilemmas-deterrence-united-states-smart-new-strategy-has-six-daunting-trade-offs

[46] Sharma, A. (2023, September 1). Malabar exercise bolsters Quad group amid growing strategic challenge in the Indo-Pacific. *Australian Institute of International Affairs*. https://www.internationalaffairs.org.au/australianoutlook/the-malabar-exercise-bolsters-quad-group-amid-growing-strategic-challenge-in-the-indo-pacific/

[47] Cheng, M. (2022). AUKUS: The changing dynamic and its regional implications. *European Journal of Development Studies, 2*(1), 1–7.

[48] Bradford, J. F. (2022). U.S.-Japan alliance modernization and maritime Southeast Asia. *Asian Survey, 62*(4), 666–694.

[49] Mann, B. S. (2024). Demystifying Indo-U.S. natural and strategic partnership. *International Studies, 60*(3), 349–368.

[50] Andrews, D. M. (2024, March 22). Faux alliances: AUKUS and Quad are no Asian NATO. *Australian Institute of International Affairs*. https://www.internationalaffairs.org.au/australianoutlook/faux-alliances-aukus-and-the-quad-are-no-asian-nato/

Unlike NATO, where decades of integrated planning and standardized procedures have created a highly cohesive military alliance, the Indo-Pacific allies of the U.S. have diverse military structure and varying levels of training standards and equipment's technology. Thus, requisite combat interoperability, despite shared strategic objectives and joint exercises, cannot be generated in case of conflict.

In nutshell, both United States and China have their strengths and vulnerabilities when power competition in Indo-Pacific is taken into consideration. The future balance of power will be determined by the ability of each state to augment its strengths and overcome its vulnerability. For United States, it is important to construct and commission next generation warships with cutting-edge technologies as per schedule. Delays or cost overrun will undermine U.S. Navy combat potential. Similarly, the progression of Washington's strategic agreements with Indo-Pacific allies will be key determinant. If Washington manages to replicate NATO in Indo-Pacific, it will greatly increase probability of USA dominating China and sustaining its order in the World. The likelihood of this scenario, despite all efforts involved, appears little. Otherwise, China is expected to gradually tilt the future balance of power in its favor which will not only transform the Indo-Pacific but the future global system as well.

6. Conclusion

China and the United States fast-track naval modernization efforts are gradually reshaping the power dynamics in Indo-Pacific region. China is modernizing and expanding PLAN to safeguard its diversifying interests and protect maritime trade. On the other hand, the United States aims to maintain its dominance by ensuring superiority of U.S. Navy in Indo-Pacific theatre. U.S. Navy currently retains significant qualitative and tonnage advantage. However this advantage is rapidly eroding as PLAN is also developing and deploying advance technologies and mass producing bigger and more capable vessels. Beside naval modernization, there are numerous contributing factors which can play

decisive role in shaping the regional balance of power. China benefits from its geographical proximity, enabling it to concentrate its forces more effectively within the Indo-Pacific, whereas the U.S. faces the challenge of dispersing its naval assets globally. Furthermore, the U.S. strategy of forming alliances, such as the Quad and AUKUS, seeks to counterbalance China's rise, although these alliances, unlike NATO, lack dedicated collective defence mechanisms. Despite the technological advancements and force expansion on both sides, the balance of power in the Indo-Pacific remains fluid. However, considering the extent of strategic, geographical, political and naval complexities involved for United States, there is higher probability that future balance of power in Indo-Pacific will be more inclined towards Beijing instead of Washington.