PALACKÝ UNIVERSITY OLOMOUC

Faculty of Arts

Department of Politics and European Studies

Bc. Jiří Kubec

Modernisation of the Chinese People's Liberation Army Navy in Xi Jinping's era: An Offensive Realist Perspective

Master's Thesis

Supervisor: Martin Lavička, Ph.D.

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I hereby declare that I am the sole author of this master's thesis and that I have not used any sources other than those listed.

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Bc. Jiří Kubec

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Thesis Outline

Introduction

"The Chinese now understand that the United States is staying in this [Indo-Pacific] region. We're the leader in this region." (U.S. Chamber of Commerce, 2023, 57:05)

— Robert Nicholas Burns, US Ambassador to China, 2023

General background

The so-called "rise of China" is one of the most consequential events at the onset of the 21st century. The rapid economic, political, technological, as well as military development of the People's Republic of China in the past three decades has become a subject of significant academic, governmental, and even popular interest.

While the first political and economic reforms in China began shortly after the end of the Maoist era, the results of these reforms were not immediate and started to come to fruition slowly: at first during the second half of the 1990s, and then mainly after the beginning of the new millennium. Similarly, the Chinese People's Liberation Army, or in English more commonly referred to simply as the People's Liberation Army (PLA), was recently put on the path of a wider, gradual modernising effort. The results of these complex modernising efforts are, however, only beginning to fully materialise at the present time.

Historically, China has been a continental power. Its might has been traditionally found not on the sea, but on land, as the necessity and experience with invading foes dictated. This paradigm, lasting – with temporary exceptions, such as the Song and Yuan dynasties' naval undertakings or the ambitious maritime expeditions during the Ming dynasty – for centuries and even millennia, changed only during the 19th century, when it did not survive the collision with the modern navies of the European powers and Japan (Xie, 2014, p. 113). The First Sino-Japanese War in 1894-1895 serves, unbeknownst to many China observers and analysts in the West,[1] as a grim cautionary tale about the importance of sea power. In 2014, the People's Liberation Army Navy

[1] While there has been resurgence of the Chinese study of the First Sino-Japanese War accompanied by scholarly conferences, CMC members speeches, and academic publications, few of the published papers have circulated outside of China or been translated into English (Rhodes, 2020, p. 44).

(PLAN) commander Admiral Wu Shengli commented on the war in an article in PLA professional journal, pointing out that "both sides' navies were central" and that the war "was won through naval battles" (Wu, 2014, as cited in Rhodes, 2020, p. 44), and other Chinese scholars highlighted the importance of "sea consciousness" (*haiyang yishi*, 海洋意识), "awareness of sea power" (*haiquan yiyi*, 海权意识). Moreover, many studying the conflict stress the importance of employing the navy aggressively, ensuring sea control and avoiding passivity and ceding initiative (Rhodes, 2020, pp. 44-46).

During the Second World War, or more specifically the Second Sino-Japanese War, China was left completely vulnerable to Japanese attacks and invasions from the sea, as its navy could not repel the Japanese fleet and prevent the landing of the ground forces, or as Hans van de Ven (2003, pp. 210-211) aptly characterised the situation of Chinese navy as being "unable to prevent smuggling let alone take on the Japanese navy". Once again has the sea, in the eyes of the Chinese, proved to be an "invasion route for foreign aggressors rather than as a medium for achieving national goals" (Cole, 2014, p. 43). The circumstances were, however, not surprising, as the development of a capable naval force would require significant costs and was therefore not on the agenda of the day (van de Ven, 2003, p. 163).

After the end of the Second World War, the resumption of the Chinese civil war and the founding of the People's Republic of China (PRC) in 1949, the new state has found itself lacking proper naval force. In May 1950, the People's Liberation Army Navy was officially established as a new branch of the PLA. However, the new navy was mostly composed of defected coastal defence vessels and could not compare to the fleet still under the command of the Kuomintang (Cole, 2014, pp. 49-50), guarding their last stronghold in Taiwan. With the beginning of the Korean War and the US naval forces "neutralising" the Taiwan strait for the time being, the Chinese Civil war froze.

While in the 1950s the PLAN slowly began to develop mainly with the assistance and guidance of Soviet military advisors, this collaboration came to an end with the Sino-Soviet split. The development of the Chinese navy was further constrained by major domestic events, such as the Great Leap Forward and the Cultural revolution. By the mid-1970s, the PLAN modernisation was slowed down by almost two decades and the navy was seen only as an extension of the army (Cole, 2014, pp. 51-53).

Sign of change came with the Four Modernisations (*si ge xiandaihua*, 四个现代化) programme set by Deng Xiaoping in the late 1970s. A defence modernisation, one of the four goals, included the advancement of the PLA Navy, mainly in terms of qualitative improvement. These efforts focused on increasing China's offshore defence capabilities in the North, East and South China seas. The PLAN was streamlined, older ships were decommissioned and first indigenously built vessels began entering service. Despite these incremental modernising efforts, the Chinese navy as a whole was, arguably, not capable of defending itself in warfare against modern navies and was unable to perform blue water combat missions (Huang, 2010, pp. 22-23).

While 1980s modernisation progressed, as Cole (2014, p. 56) puts it, "at a measured pace," it did set solid foundations for a future build up. The beginning of the expansion and first steps towards a creation of a blue water navy can be seen in the second half of the 1990s. The number of PLAN major surface combatants increased from 50 in 1995 to 75 in 2005 and the number of submarines grew from 48 in 1995 to 64 in 2005 (Huang, 2010, pp. 23-25). Facilitated by political demand and an abundance of financial resources, the development of powerful naval force continued, albeit with rationales behind it unknown to the external observers (Lim, 2014, p. 3).

Since the beginning of the new millennium, China has commenced an ambitious naval construction program, that markedly improved the People's Liberation Army Navy's ability to undertake blue-water operations within the first and second island chains and even carry out far-seas deployments (Fanell, 2019, p. 16). This reflects shift in China's maritime strategy, that no longer confines navy to coastal defence, but incorporates offshore defence as well as limited power projection (Tayloe, 2017, p. 9).

With the single exception of the US naval build-up during Reagan's presidency, the Chinese naval expansion between 2000 and 2018 has by far exceeded any other nation's post-World War II era naval growth (Fanell, 2019, p. 16). However, as Tayloe (2017, p. 9) further points out, China has "record of failing to communicate the intentions underpinning its defence policies and actions" which has resulted in distressing the US and its allies in the East Asia region. Despite the peaceful nature of China's naval expansion so far, regularly stressed in official statements and proclamations, concerns have likewise grown among countries in South and Southeast Asia (Huang, 2010, pp. 31-32), and only intensified with time.

The Scope of the Thesis

This thesis examines the transformation of the People's Liberation Army Navy (PLAN), i.e., the naval forces of the People's republic of China, in the past decade. While there are many distinct ways to approach this topic, the thesis focuses on analysing the gradual process of modernisation and development of the key constituent branches of the PLAN from the perspective of the international relations theory of offensive realism.

While the PLAN is composed of five branches – i.e., surface force, submarine force, marine corps, naval aviation, and coastal defence force (State Council Information Office, 2019), this thesis is focused on the three key branches, namely the PLAN Surface Force, PLAN Submarine Force and the PLAN Marine. The naval aviation and the coastal defence force will not be included in the analysis because of the character of the thesis and the set-out goals. Due to the selected theoretical approach and overall scope and level of analysis, the analytical part will focus almost solely on the military-technical aspects of the aforementioned branches, and not on the "soft" factors of the People's Liberation Army Navy, such as leadership, training, and education developments, etc.

Timewise, the thesis is delineated to the period of "the past decade," i.e., from the years 2012/2013 to the years 2022/2023, and is so for several reasons. First, in certain aspects the thesis freely follows up on the 2014 work of Yves Heng-Lim, *China's Naval Power: An Offensive Realist Approach*, which in its analytical chapter dealing with the modernisation of the PLA Navy at large goes up to the year 2011.

Second, the change of the top Chinese leadership in the years 2012 and 2013 and the accession of the new generation, headed by Xi Jinping, into power lends itself as an appropriate starting point for the analysis. Specifically, the thesis will therefore cover the modernisation of the Chinese navy during Xi Jinping's first two terms in office as the General Secretary of the Central Committee of the Communist Party of China (CPC), chairman of the Central Military Commission (CMC) of the CPC, and the corresponding state offices of the President of the People's Republic of China (PRC) and the chairman of the Central Military Commission of the PRC—a duplicate of the CPC's CMC in all but name, and elected with a half year delay.

Aims of the Thesis & Research Questions

The primary objective of this thesis is to examine the development and the modernisation of the People's Liberation Army Navy and its key constituent branches, and to provide an overall analysis of the Navy's modernisation through the lenses of offensive realism. The secondary objective of the thesis is to present a quantitative analysis of the vessels, aircraft, and possibly other equipment of the PLAN affected by the ongoing modernisation.

The thesis seeks to answer following research questions:

1) Does the modernisation of the People's Liberation Army Navy align with prescriptions and expectations of the offensive realism? If so, how?

2) Which of the analysed branches of the PLAN underwent the most significant transformation within the selected timeframe?

Answering these research questions will contribute to fulfilling the defined objectives of the thesis.

Methodology & Thesis Outline

In terms of methodological approach, the thesis is conceived as a unique qualitative case study, which utilizes the methods of analysis, synthesis, description, and explanation. As a single-case study, this work is highly focused, intensive study of a single selected case. This furthermore allows for the least amount of superficiality in the analysis, compared to studies of multiple cases (Gerring, 2017, pp. 28-29).

Given the chosen theoretical approach, this study could be also viewed as loosely bordering a theory-guided case study (Levy, 2008), or a disciplined-configurative study (Eckstein, 2000). The theoretical perspective is, however, not intended to serve as a focal point of this thesis, but rather as "thought background" or an ideological foundation, upon which is analytical part of the thesis constructed. Furthermore, the study will serve as a bridge, of sort, or a connector between the broader, theoretical approaches to international relations, geopolitics and geostrategy, and the more narrow-focused analysis of a specific military branch. While either of these are amply represented on their own, only rarely are they combined.

The thesis is informally divided into two main parts. The first part, consisting solely of the first chapter, introduces offensive realism as the theoretical approach of the study and thus provides the theoretical background for the subsequent analysis and conclusion. The second part, consisting of the other three chapters, serves as the analytical part of the thesis and deals with the People's Liberation Army Navy's modernisation itself.

The first chapter presents the structural international relations theory of offensive realism as the theoretical approach of the thesis and the issue of the modernisation of the PLA Navy. The first subsection of the chapter retraces the logic of offensive realism as developed by John J. Mearsheimer and others. The second subsection introduces a novel argument by Yves-Heng Lim regarding the role naval power contrary to the original Mearsheimer's assumption. This expanded offensive realist approach will be then utilized as the perspective for the analysis in later chapters.

The second chapter focuses on the surface forces of the PLAN, the traditionally most important segment of the Navy as a whole. For the sake of clarity, the chapter is further subdivided into several sections and subsections, each analysing a different part of the surface forces: a) principal surface combatants (aircraft carriers, cruisers, destroyers and frigates), b) patrol and coastal combatants (corvettes, missile boats, submarine chasers and gunboats), c) amphibious warfare vessels (landing helicopter docks, landing platforms docks, landing ships and landing crafts), d) mine warfare vessels.

The third chapter examines the submarine forces of the PLAN. The chapter is likewise divided into sections and subsections, each focused on a different submarine type: a) nuclear-powered ballistic missile submarines and conventional ballistic missile submarines, b) nuclear-powered attack submarines, and c) conventional attack submarines.

The fourth chapter focuses on the PLAN Marine Corps, a quickly evolving branch of the Chinese Navy. Attention is paid to the new, post-reform organisational structure, ongoing modernisation of the land-warfare equipment, as well as the development of combined arms capabilities, and introduction of the aviation element. The assessment of the PLAN Marine Corps' role is part of the analysis.

Literature review

The thesis utilizes a wide range of sources, reflecting the broad objective of analysing both the military-technical aspects of the selected key branches of the PLAN, altogether with an underlying theoretical background. Nevertheless, given the high relevance of the topic at the present time, there is abundance of sources and literature dealing with the issue of modernisation of the Chinese navy.

In terms of combing the offensive realist theoretical perspective and the analysis of the PLAN, the 2014 monograph by Yves-Heng Lim, *China's Naval Power: An Offensive Realist Approach*, proves to be a seminal work in the field. Besides introducing a novel theoretical argument for understanding China's naval rise, Lim explores the political contexts of Beijing's bid for regional hegemony, the Chinese naval strategy and doctrine, the question of Taiwan, the territorial and maritime issues in China Seas, as well as the military-technical aspects of the PLAN's modernisation itself.

The 2015 monograph *Assessing China's Naval Power: Technological Innovation, Economic Constraints, and Strategic Implications* by Sarah Kirchberger is an outstanding in-depth analysis of the ongoing Chinese naval modernisation, with much detail paid to the technical and technological aspects of the development, and as such has proved highly reliable and useful for the purposes of this thesis.

At more theoretical level, the topic of the modernisation and development of the PLAN is explored from many angles by a variety of authors, such as Tayloe (2017), Fanell (2019), or Rhodes (2020), who comments on the modernisation and the motivations behind PLA Navy structure design in a thought-provoking article *Same Water, Different Dreams: Salient Lessons of the Sino-Japanese War for Future Naval Warfare*, noting the influence of the institutional setting (military, government, party) on the fleet architecture. Despite arguing for a different motivating factor, he notes the clear shift towards an oceangoing navy with full blue-water combat capabilities and the desire to "[push] the strategic forward area ... outward to defend against the enemy as far away as possible" (Rhodes, 2020, pp. 49-47).

For the purposes of analysing the individual branches and segments of the PLAN, typically more focused works of narrower scope were utilized. A key work in the area of the PLAN Surface Force is the 2017 edited volume *China's Evolving Surface Fleet*

by Dutton and Martinson, covering a wide range of developments in an up-to-date perspective. In contrast, the topic of amphibious fleet modernisation, as well as Chinese decision-making, operations, and concepts in regard to the Taiwan-scenario is aptly covered in a comprehensive edited book *Crossing the Strait: China's Military Prepares for War with Taiwan* (Wuthnow et al., 2022). For the analysis of the submarine component of the PLAN, the works of Harris (2016), Sarkar (2019), and Ray (2020) exploring the Chinese submarine capabilities, have likewise proved useful. These complement a large number of scientific journal articles, online news and magazine articles, many of which are from *Proceedings* magazine published by the U.S. Naval Institute, expert military server *janes.com*, and or news articles from sites such as *navalnews.com*, *naval-technology.com* and *thediplomat.com*.

A number of highly useful, in-depth and reliable reports from the series *China Maritime Reports* by China Maritime Studies Institute of the U.S. Naval War College have been likewise utilized for the purposes of the thesis, namely works by Kennedy (2021), Kennedy & Caldwell (2022) or Caldwell, Freda, & Goldstein (2020).

Many of the typically annual *China Naval Modernization: Implications for U.S. Navy Capabilities* reports by Ronald O'Rourke (2013, 2015, 2020, 2022) and the U.S. Congressional Research Service are of more technical nature but provide an excellent up-to-date overview of the PLAN developments. As a cornerstone of the quantitative analysis have proved to be the annual issues of *The Military Balance* by The International Institute for Strategic Studies (IISS). Notable is also the annual overview *Jane's Fighting Ships*, of which the 2009 issue has been utilized (Saunders, 2009), especially due to the immense level of detail in regard to the older PLAN vessels.

1 Theoretical Background

This chapter provides the theoretical foundation of the thesis and introduces the theory of offensive realism as the basis for the analysis and understanding of the modernisation of the People's Liberation Army Navy (PLAN). The first section of the chapter presents the theory of offensive realism as developed by John J. Mearsheimer and others. The second section introduces an alternative argument of Yves-Heng Lim regarding the role of sea power in a setting, where a potential regional hegemon is opposed by a distant great power and endorses the claim that modernization of Chinese naval forces stems primarily from China's need and ambition to secure a hegemonic position in the East Asian region.

1.1 The Theory of Offensive Realism

Offensive realism is a structural theory of international relations. As such, it follows the basic explanatory assumption that it is the structure of the international system that causes states to pursue power (Mearsheimer, 2014, pp. 18-21). While offensive realism is currently one of the most prominent international relations theories, it builds upon the dominant position of structural theories not only within the realist school of thought but also their widespread popularity in the field of international relations in general (Smith & Dawson, 2022, p. 177). In many aspects, the offensive realists, and structural realists in general, both follow up on the long tradition of the classical realists.

One of the main similarities between classical and offensive realism is the assumption that states desire to relentlessly increase, and even maximize, their power and influence. Roots of this axiom can be found as early as in the writings of Thucydides, who in the famous Melian Dialogue declared that "the strong do what they can and the weak suffer what they must" (Lobell, 2010, p. 3). However, while classical realism dominated the field of international relations mainly in the 1950s and 1960s (Mearsheimer, 2014, p. 19), its' grip on the discipline weakened during the so-called 'behaviourist revolution' in the social sciences, often perceived as the second great debate of international relations (Curtis & Coivisto, 2010). With the end of the 1970s came a significant turning point within the discipline and to a certain extent 'reboot' of the study of international relations.

The 1979 book *Study of International Politics* by Kenneth Waltz marked the emergence of structural realism, alternatively also called neorealism. Waltz (1979) introduced the assumption that the defining cause for states' behaviour is the structure of the international system, especially its defining characteristic – anarchy. As Johnson & Thayer (2016, p. 3) point out, compared to classical realism, Waltz's structural realism, or neorealism, enjoyed more solid foundations. Although the impact of classical realists and their work was not limited only to the academic sphere, but also significantly affected the policymaking of its day, the argument upon which the theory rested was arguably weak. One of the most acclaimed realist thinkers, Hans Morgenthau, thought human nature to be the ultimate causation of state behaviour. Such a claim, however, is noumenal, i.e., not scientifically verifiable, or demonstratable. In contrast, the neorealist conception of international anarchy as a structural cause of state behaviour in the international system is a measurable, tangible phenomenon.

Offensive realists follow Waltz's elementary argument. However, contrary to their defensive realist counterparts, offensive realists do not perceive the naturally anarchic international system as secure, quite the opposite. As Layne (2006, p. 17) states, offensive realists believe that the international political system is a security-scarce environment. The basic logic ensuing from this assumption is well reflected in the concept of "security dilemma" (Mearsheimer, 2014, pp. 36-35).

While both offensive and defensive realists consider the security dilemma, a concept first introduced by John Herz (1950), to be the cause of structural insecurity, offensive realists think that such a dilemma is practically insolvable (Lim, 2014, pp. 10-11). Herz (1950: 157) succinctly captured the substance of the security dilemma as follows:

> Groups or individuals ... must be, and usually are, concerned about their security from being attacked, subjected, dominated, or annihilated by other groups and individuals. Striving to attain security from such attack, they are driven to acquire more and more power in order to escape the impact of the power of others. This, in turn, renders the others more insecure and compels them to prepare for the worst. Since none can ever feel entirely secure in such a world of competing units, power competition ensues, and the vicious circle of security and power accumulation is on.

Layne (2006, p. 15) points out, that the "security dilemma" is a misnomer and should be understood rather as an "insecurity condition" arising from the states' power-seeking behaviour. However, the security-scarce environment is merely one underlying aspect of the offensive realist understanding of the international system. To comprehensively explain why states, and chiefly great powers pursue might, compete, and strive for hegemony, John Mearsheimer (2014) presents in his ground-breaking work *The Tragedy of Great Power Politics* five, so-called, "bedrock assumptions" of offensive realism – five assumptions that only when "taken together ... depict a world in which states have considerable reason to think and sometimes behave aggressively" (Mearsheimer, 2014, pp. 29-32).

The first of these assumptions is the aforementioned anarchic nature of the international system. Anarchy, in an eye of an offensive realist, is by itself an "ordering principle" rather than a state of chaos, disorder or conflict. It describes a system of independent actors, states, which have no higher authority to respond to (Mearsheimer, 2014, p. 30).

The second assumption is that great powers possess "offensive military capability". This, Mearsheimer notes, is an inherent trait of states in general: the potential to harm other states. The level of danger a state or a great power might pose to other states also rises with the amount of might, i.e., military power it has at its disposal. And while states' military power is typically assessed by the amount of weaponry, even in the case of a state with no or very few weapon systems, the level of offensive military capability is non-zero (Mearsheimer, 2014, pp. 30-31).

The third 'bedrock assumption' is that the states are always uncertain about other states' intentions, especially when it comes to the possible use of offensive military capability. States, simply put, can never be sure whether they will not become targets of a hostile force, that is, whether they will not be attacked. Not only is it practically impossible to estimate the intentions of others with a hundred per cent certainty, but it is ever more so undoable considering the intentions can change within a day; as Mearsheimer puts it "benign one day and hostile the next" (Mearsheimer, 2014, p. 31). In the case of China, the 1969 Sino-Soviet border conflict and the impending threat of a Soviet nuclear attack may serve as a good example of the difficulty to estimate the intentions of other states. While from the Soviet point of view, premier Kosygin's visit to Beijing

and the negotiations with the Chinese side represented a certain *dénouement* of the crisis, in the eyes of the Chinese leadership a nuclear strike was imminent, and the diplomatic efforts were viewed either as a smokescreen or even a modern-day Trojan horse (Gerson, 2010, pp. 46-52).

The fourth assumption positions survival as the primary goal of great powers. The logic behind this presupposition is rather simple; after all, if a state does not survive, it cannot pursue any other goals. Survival in this case means the preservation of the territorial integrity of the country and keeping its "domestic political order" autonomous (Mearsheimer, 2014, p. 31). Indeed, this assumption becomes ever more so evident in the case of China, with its—nowadays—unique political system built around the Communist party's unquestionable leadership position, free from any Western liberal influence.

The fifth and final assumption is that great powers act rationally. They do not pursue their goals without consideration of the other actors and the international political environment, quite the opposite. States think strategically, consider the behaviour of other states, as well as the possible impact of their own actions, and pay attention to the long term (Mearsheimer, 2014, p. 31).

These five foundational assumptions of offensive realism then together motivate great powers to behave in a certain way towards one another. Specifically, they bring about three general patterns of conduct: fear, self-help, and power maximisation. (Mearsheimer, 2014, p. 32). As great powers possess the means to attack one another and their motivations to do so cannot be ruled out, they inevitably fear each other. While the amount of fear may vary from one state to another, and change in time, it is always present and "cannot be reduced to a trivial level", as the consequences of losing a conflict, a war, are potentially unlimited. A state in such a fearful condition will seek to guarantee its own survival. Even though states can form an alliance, offensive realists believe these are but "temporary marriages of convenience", and as such are always subject to change and do not last. All in all, states tend to see themselves as alone in an unsafe environment, and as such will resort to a self-help mode of operation, or simply put, will act selfishly. (Mearsheimer, 2014, p. 33). This imperative of states to act according to their own interests is only intensified when it comes to nuclear powers. Great powers possessing nuclear weapons, but exposed to the threat of

mutually assured destruction, are subjected to simple logic: "it's better one's allies be conquered than for one's homeland to be destroyed" (Layne, 2006, p. 165).

In such circumstances, states will find the logical solution to the struggle of ensuring their survival: power maximisation. As John Mearsheimer (2014, p. 33) writes: "states … understand that the best way to ensure their survival is to be the most powerful state in the system". It is important to note that from the offensive realist viewpoint, the ultimate goal is not to merely maximise the amount of power and occupy the position of the most powerful state *in stricto sensu*. States cannot define the precise level of power that would suffice to ensure their security in all and any scenarios, and especially the worst-case scenarios that states in the ever-uncertain anarchic system must anticipate (Lim, 2014, p.15). Therefore, the state will try to increase the relative share of power between itself and others *ad infinitum*. Following this logic, great powers will seek to become a hegemon—the only great power in the system (Mearsheimer, 2014, p. 2).

With the stress on hegemonic ambition, Mearsheimer and offensive realists intensify the logic of power maximisation in contrast to the assertions that the ultimate goal of states or great powers is primacy, even though there are clear similarities between the two (Lim, 2014, p.16). As Huntington (1993, p. 70) asserts:

> States pursue primacy in order to be able to ensure their security, promote their interests, and shape the international environment in ways that will reflect their interests and values. Primacy is desirable not primarily to achieve victory in war but to achieve the state's goals without recourse to war. Primacy is thus an alternative to war.

The substance of primacy, however, can be encapsulated with the expression *primus inter pares*, which makes the distinction between primacy and hegemony clear. Hegemony is, as Lim (2014, p. 16) points out, worth striving for precisely because of the unique—sole secure—position within the international system. Hegemony, by its very nature, assures safety in case of either individual or collective challenge by the other members of the international system.

Offensive realists disagree on the question of hegemony's limits. John Mearsheimer (2014, p. 41) makes the case—considering the existence of nuclear weapons—for a limit of the state's ability to grow its hegemonic position, mainly due to the perceived

difficulty of power projection across oceans. This so-called "stopping power of water" is what prevents great powers from achieving global hegemony and limits their ambitions to their respective regions and possibly land-accessible regions adjacent to them.

In contrast, Christopher Layne (2002) argues that the five bedrock assumptions of offensive realism hold true for both regional and global levels of the international system and that once great power achieves regional hegemony, it will continue its quest for power, regardless of natural barriers. He points out that "it is difficult to understand why, once a great power becomes a regional hegemon, the stopping of water transforms it from a power maximiser into a status quo power" (Layne, 2002, p. 129). The point is that regardless of the eventual outcome, the behaviour of the state does not change.

Whether great powers can achieve global hegemony or not, offensive realists follow Mearsheimer's assertion that a regional hegemon already in being will not stand idly to see a creation of its peer—another great power becoming a hegemon in its own region (Lobell, 2010, p. 4). If such a 'second regional hegemon' were to emerge, it could assume the role of "peer competitor", a rival power that could potentially undermine the position of the original regional hegemon. Thus, it is in the interest of the regional hegemon to ensure that in any other region, there are at least two great powers competing against each other, and therefore having to pay more attention to their regional neighbour, rather than thinking about upsetting the position of the distant hegemon (Mearsheimer, 2014, pp. 42-43).

Before moving on to examining the relationship dynamic between a distant hegemon and its potential peer, attention deserves to be shifted to several other key concepts of offensive realism regarding the conduct of states, namely the strategies they employ for gaining power and strategies to counter the aggressive states. Mearsheimer (2014, pp. 147-155) identifies four power-gaining strategies states might use to increase their power: 1) war, arguably the most controversial strategy, considering how unpredictable the results may be; 2) "blackmail", in practise often unsuccessful strategy, consisting of threatening to use military force, rather than actually using it, to achieve the desired outcome and gain power at the expense of the rival state; 3) "bait and bleed" strategy, which consists of causing two rivals to fight, or to "bleed each other", while the baiter

retains his strength intact, thus improving its own relative position; and 4) "bloodletting" strategy, i.e., helping to prolong a war between rival states. The bloodletting strategy can be perceived as "a more promising variant" of the bait and bleed strategy, as there is no 'baiting' and the state seeking to improve its standing must merely continually support one or the other side while staying out of the fight (Mearsheimer, 2014, pp. 147-155).

To counter these strategies, and generally the efforts of a highly aggressive state vying for regional hegemonic position, great powers may follow two main strategies: balancing strategy, and buck-passing strategy. Offensive realists claim that states always prefer buck-passing and commit to balancing only in situations where there is no other option (Mearsheimer, 2014, p. 155).

Despite its widespread use in the sphere of international relations, the term 'balancing' is often rather ambiguous. Nevertheless, balancing is essentially a "countervailing strategy" that great powers employ when power asymmetries arise (Layne, 2006, p. 143). In such situations, states have three options for how to deal with the aggressor: a) try to deter the aggressive state by diplomatic means, i.e., issue a warning, or generally a confrontational—not conciliatory—message; b) try to "balance externally" by creating a defensive alliance to contain the aggressive state; and or c) mobilise their own resources—wealth, manpower, etc.—in order to brace against the aggressor on their own, in a pure self-help fashion, thus "balancing internal[ly]" (Mearsheimer, 2014, pp. 156-157). The internal and external balancing strategies can be considered the two basic categories of "hard" balancing, i.e., balancing by military means (Layne, 2006, p. 143). The alternative to balancing is the buck-passing strategy, delineated by Mearsheimer (2014, pp. 157-158) as follows:

> A buck-passer attempts to get another state to bear the burden of deterring or possibly fighting an aggressor, while it remains on the side-lines. The buck-passer fully recognizes the need to prevent the aggressor from increasing its share of world power but looks for some other state that is threatened by the aggressor to perform the onerous task.

Although the basic logic, as encapsulated in the paragraph above, is quite simple, buck-passing on a whole requires a significant diplomatic effort. To facilitate buck-passing, states can employ four measures. One is establishing good diplomatic relations with

the aggressor so that it will shift its attention to the intended buck-catcher. The second measure is the buck-passer keeping rather lukewarm relations with the intended buck-catcher, in order to seem more palatable to the aggressor on one hand and to not get unintentionally dragged into the conflict on the side of the buck-catcher on the other hand. Third, great power can further mobilise its resources—e. g., increase defence spending—to dissuade the aggressor from attacking, and make seem the buck-catcher an 'easier target' in comparison. The fourth measure is to allow, or even help the intended buck-catcher to gain more power with the aim of enabling the buck-catcher to better contain the aggressor state (Mearsheimer, 2014, pp. 158-159).

It ought to be pointed out that these terms are not mere theoretical expressions disconnected from the functioning of international politics, but to the contrary are a firm part of the tense reality. In an editorial published by the Chinese military in March 2022, the US is accused—amongst other things—of being a buck-passer (Jun, 2022).[2]

To conclude the first section of this chapter, one last key concept of offensive realist theory deserves attention: offshore balancer. The term 'offshore balancer' describes a role a regional hegemon might assume in relation to other regions where buck-passing strategies have failed, and local states cannot stop a rising great power on their own. John Mearsheimer (2014, pp. 234-266) deals with the concept of offshore balancing chiefly in relation to the cases of the United States and the United Kingdom and points out that offshore balancing "might appear to provide the strongest evidence against [his] claim that great powers are dedicated to maximising their share of world power" (Mearsheimer, 2014, pp. 234). While offshore balancing is a grand strategy based on the realist theory of international relations, it is a balance-of-power strategy and does not subscribe to the hegemonic assumptions of later offensive realists (Layne, 1997, p. 113).

As a concept, it focuses on the question of maintenance of the systemic balance. Offshore balancers follow the notion that outside of the Western hemisphere, there are three "primary overseas regions" with significant importance to the United States—the hegemon of the Western hemisphere: namely Europe, East Asia and the Persian

[2] The article is part of a series authored by certain 'Jun Sheng', a pseudonym for "Voice of the Military" that is generally interpreted to represent the PLA Daily editorial board's opinions on issues of concern (deGategno & Waidelich, 2022).

Gulf. If one of these regions were to come under the control of a rival power, a potential regional hegemon, it might provide the adversary with enough strength to endanger the position of the U.S. itself (Brands, 2015, p. 13). In essence, offshore balancing is a "counterhegemonic" grand strategy. Although the hegemon prefers to deal with the rising great power, a potential peer competitor, by buck-passing, in cases where regional balancing fails, the hegemon will intervene military to restore the regional balance of power. Then, the hegemon falls back and does not act as a peacetime stabilizer (Layne, 2006, p. 24).

It should not be a surprise to state at this point that the major focus of offensive realists is the uneasy relationship between the United States of America and the People's Republic of China. As John Mearsheimer argues in the final chapter of his 2001 magnum opus *The Tragedy of Great Power Politics*, many offensive realists are of the view that China is not likely, or expressly cannot rise peacefully (Mearsheimer, 2014; 2006; 2010; Lim, 2014). This is not to say that it will be China who will 'shoot first' or that it has some hidden, sinister motives. Offensive realism simply offers insight into the workings of great powers and seeks to provide an explanation of international politics. To say metaphorically: "offensive realism is like a powerful flashlight in a dark room: even though it cannot illuminate every nook and cranny, most of the time it is an excellent tool for navigating through the darkness" (Mearsheimer, 2014, p. 11). And provided that 'navies sail downstream of international politics', it can, too, help us grasp the rapid growth of the Chinese naval might.

1.2 Potential Regional Hegemon & the Role of Navy

When it comes to China's naval rise, i.e., the development, modernisation and fast-paced growth of the PLAN, there are several prominent perspectives that try to explain the motives behind it. One of the more traditional explanations, frequently gaining the attention of the media, is that the naval expansion is motivated by the PRC's desire to conquer Taiwan. In October 2022, the US Secretary of State Anthony Blinken stated that China is "determined to pursue reunification [with Taiwan] on a much faster timeline" (Marlow, 2022), shortly after that the US Chief of Naval Operations Admiral Mike Gilday warned China could act against the island even before 2024 (Sevastopulo, 2022). In a US Congressional report, O'Rourke (2022, p. 4) indicates that "China's military modernization effort, including its naval modernization effort, is assessed as

being aimed at developing capabilities for, among other things, addressing the situation with Taiwan militarily, if need be." Another perspective is provided by the Chinese leadership itself, arguing for a "peaceful rise/development" logic of military build-up. Even the growth of the Chinese navy is being presented as a "blessing for world peace" (chinadailyhk.com, 2019) of which China seeks to be seen as a defender. Third explanatory perspective is Ross's "naval nationalism" and desire for prestige as the motivating factor behind China's naval ambitions (Ross, 2009). In contrast to these approaches, Yves-Heng Lim offers an alternative perspective in his book *China's Naval Power: An Offensive Realist Approach*, followed in this thesis.

Lim (2014) presents an approach based on a "navalised version of offensive realism" (Lim, 2014, p. 139), which claims that the modernisation of PLAN "stems primarily from China's need and ambition to secure a hegemonic position in the East Asian region" and argues that "naval forces will play a pivotal role in preventing the United States from interfering and, if necessary, in defeating US attempts to derail China's quest. (Lim, 2014, p. 6). First, it is however important to note two significant modifications to the standard 'Mearsheimerian' offensive realism, upon which Lim further constructs his argument: first, the redefinition of geographical obstacles as relative barriers, and second, introduction of 'distant great powers' as 'normal' powers in an overseas region they can reach.

As Toft (2005, pp. 393-394) points out, the offensive realist definition of a region is unclear. Mearsheimer does not address the boundaries of the regions in which intraregional competition for power plays out, which only adds to the problem of ambiguous understanding of a region. Lim (2014, pp. 18-20) addresses this issue by subscribing to the regional security complexes theory of Barry Buzan and Ole Waever (2003). Although those are in essence based on "a blend of materialist and constructivist approaches" (Buzan & Weaver, 2003, p. 4, as cited in Lim, 2014, p. 18), and might seem in direct contradiction to offensive realism, Lim approaches the issue pragmatically. Since the regional security complexes are established on "patterns of amity and enmity", they indeed fit the neorealist framework, as "amity and enmity are directly dependent on power relations". Therefore, these 'realist' regional security complexes are determined by power configuration (Lim, 2014, p. 18-19).

Lim (2014, p. 19) further argues, that the formation of specific power configuration depends on geography, or more specifically on the distance between the states, which in turn allows distant great powers to act as 'normal' powers in regions other than their own, provided they can reach them. In contrast to the more conventional understanding of obstacles in absolute terms, as demonstrates by Mearsheimer's (2014, pp. 83-137) well-established primacy of land power, Lim turns to more relative understanding through the so-called "loss-of-strength gradient".

As characterized by Kenneth Boulding (1962, p. 231), the loss-of-strength gradient is "a cost of transport of strength, whatever strength is", and is therefore related to the issue of power projection. The strength of a state, consequently, declines in proportion to the distance to its 'home base'. However, if the 'home base', i.e., hegemon's home region, can provide enough power to overcome the 'relative obstacle' of distance, then the hegemon, or 'distant great power' will be allowed to act as a "normal power" in a region different from its own. As such, it will then be able to claim hegemony in the region (Lim, 2014, p. 19-20).

As offensive realism assumes, states vie for power. Howsoever tragic it may be, the relentless logic of survival compels great powers to dominate each other, even if it is for no other reason but to secure their own survival (Mearsheimer, 2014, p. 3). Regional hegemons, in like manner, are compelled to deal with potential peer competitors in distant regions and are compelled to do so preventively, or as Layne (2002, p. 130) puts it: "to strangle the baby in the crib" and thus make a bid for extra-regional hegemony. However, due to the relative nature of obstacles—seas and oceans—between regions, and ultimately due to distance, both the rising great power and the regional hegemon trying to prevent their respective competitor's victory would proceed in their fight on an uneven playing field. Lim (2014, pp. 20-21) summarizes the nature of this imbalance as follows:

> While [the rival powers] play the same game for supremacy, they play it by somewhat different sets of rules. For distant great powers, membership to a region is never granted; it has to be conquered. To state the obvious, a distant great power is able to make its weight felt only in the regions that remain open to its military forces ... By contrast, a potential regional hegemon has, by definition, unlimited access to its own region and can be

> relatively unconcerned about how it will throw its weight around. However, as the intervention of a distant great power might thwart its hegemonic ambitions, a potential regional hegemon has a crucial interest in insulating its own region from external interference (Lim, 2014, pp. 20-21).

The consequences of the "uneven playing field" effect become readily apparent. Despite having the same goal in the same region, both the distant great power and the potential regional hegemon are 'pushed' towards different means through which they can achieve their goals. Therefore, in case of hegemonic extra-regional power competition between the United States and the People's Republic of China, both at home in their respective regions separated by the Pacific Ocean, this results in different structure of forces that can be utilized in such an environment—navy.

Turning back to the regional security complexes theory as presented by Buzan and Weaver (2003, p. xxvi), seas or oceans are what separate the majority of "regional dyads", with the sole exception of the Central African Complex being accessible only by land. Seas and oceans are therefore crucial for almost any extra-regional access to one of the regional security complexes. As suggested before, a suggestion of such kind of extra-regional intervention logically challenges Mearsheimer's "primacy of land power" (Lim, 2014, p. 22). Instead, it is more suitable to focus on the ocean as on "great highway" (Mahan, 1890, p. 25), that great powers may use to their benefit.

As Julian Corbett (1911, p. 91) famously put it, "the object of naval warfare must always be directly or indirectly either to secure the command of the sea or to prevent the enemy from securing it". This statement holds true when viewed through the prism of the 'navalised' offensive realism and even in the age of new technologies and weapon systems—submarines, aircraft, and long-range anti-ship missiles—unseen in Corbett's time, which in fact only intensify its veracity. Furthermore, command of the sea is not sought for its own sake, but for higher political goals and interests on land, in line with Mearsheimer's offensive realist assumptions (Lim, 2014, pp. 25-26). In the case of both the potential regional hegemon in East Asia—China—and the distant great power—the USA—command of the oceans, and chiefly seas in the immediate area of Southeast/East Asia, would be of crucial importance.

While for the distant great power command of the sea may allow power projection—either through amphibious operations, troop transport for land operations, or indirectly

through blockade—the rising great power or potential regional hegemon will seek to achieve command of the sea not to project its power, but rather to prevent its adversary from doing so. In short, the potential regional hegemon will try to turn the sea into an actual barrier by implementing a range of sea-denial strategies. Moreover, while the potential regional hegemon benefits from the uneven playing field to begin with, it will further seek to stress its advantage by structuring its naval forces in a manner so that they can 'insulate' the region and deny access to the region to any adversary. That can be most efficiently done by employing sea denial strategies (Lim, 2014, pp. 27-29).

The substance of 'sea denial' lies in ensuring "the condition short of full sea control that exists when an opponent is prevented from using an area of sea for his purposes" (Till, 2018, p. 193). The means of achieving such a condition are relevant as well. Turner (1977) points out that sea denial is not a matter of having numerically comparable forces level and facing the enemy directly, to the contrary: "sea denial is essentially guerrilla warfare at sea. The denying naval commander strikes at a time and place of his choosing to achieve maximum surprise" (Turner, 1977, p. 347). The importance of sea denial strategies, as well as Anti-Access and Area Denial (A2/AD) operational concepts, is further amplified by technological developments such as smart mines, fast attack crafts, anti-ship missiles, and even dedicated ballistic anti-carrier missiles (Till, 2018, pp. 193-195).

To conclude, if China attempts to achieve regional hegemony in the East Asia, it will face resistance at two levels, first from the regional actors themselves, and secondly from a distant great power—a regional hegemon on its own—trying to prevent the rise of a peer competitor. As Lim says (2014, p. 31), since the competition is not limited to the regional chessboard but is occurring on a "regional/global nexus", the role of navies is greater than offensive realism originally suggested. While both the potential regional hegemon and the distant great power are ultimately pursuing the same goal and both have interests on sea, their needs in terms of naval forces differ. The needs of China, the potential regional hegemon—to prevent the US, the distant great power from entering its region—will naturally translate into the structure of the Chinese naval forces, primarily along the sea denial capabilities.

Finally, it is important to note that offensive realism, and specifically "navalised" offensive realism does not consider Taiwan, Senkaku/Diaoyu or Spratly Island to be

non-issues, irrelevant to the rise of China or wholly unimportant to the development of China' naval capabilities. Rather, it argues that "China's naval anti-access capabilities and strategy would undoubtedly survive the resolution of Taiwan, Senkaku/Diaoyu and Spratly issues, even if the resolution was reached according to Chinese terms" (Lim, 2014, pp. 139-140). To put it in the most straightforward manner, even if Taiwan and the archipelagos and islands in the South and East China sea simply disappeared—as if they sunk into the oceans—overnight, the question of China's growing naval might, of its motivations, and goals would still stand.

2 Surface Force

This chapter analyses the modernisation and development of the People's Liberation Army Navy Surface Force, arguably the most significant PLAN branch. The chapter is divided into five main sections, four of which focus on the constituent segment of the Surface Force: a) principal surface combatants, b) patrol and coastal combatants, c) amphibious warfare vessels, d) mine warfare vessels. The fifth section offers a comprehensive conclusion.

The PLAN Surface Force is a highly varied branch that includes vessels ranging from small patrol boats to aircraft carriers. Compared to the previous periods, the surface fleet is gaining importance, with dozens of ships having been commissioned. The development of the PLAN Surface Force represents a key part of understanding the motivations behind China's naval modernisation.

2.1 Principal Surface Combatants

2.1.1 Aircraft Carriers

To follow the maxim noted by Admiral Sureesh Mehta (2017, 67), that "any discourse on PLAN modernization has to begin with the Chinese aircraft carrier program," this chapter, indeed, first analyses the developments of the PLAN aircraft carrier force.

On 25 September 2012, the first Chinese aircraft carrier, *Liaoning* (辽宁), was commissioned into the PLAN. Although originally unfinished Soviet and later Ukrainian carrier, laid down in 1988, its acquisition represented a significant development for the Chinese navy. The medium-sized carrier capable of accommodating an air wing of approximately thirty-six fixed-wing and rotary-wing aircraft marked "China's entry into an exclusive club of great powers" (Scobell, McMahon, & Cooper, 2015, pp. 1-2). *Liaoning's* air wing capacity was initially estimated to be 18-24 J-15 fighters, 4 JL-9 trainer/combat aircraft; and up to 17 helicopters, possibly Ka-28/Ka-31/Z-8S/Z-8JH/Z-8AEW (IISS, 2013, p. 289).

The second carrier, a single Type 002 class ship *Shandong* (山东), was subsequently commissioned on 17 December 2019. Although similar in its design to the *Liaoning*, notably both being fitted with a so-called ski-jump assisted "Short Take-Off But

Arrested Recovery" (STOBAR) launch system, *Shandong* was the first Chinese domestically designed and built aircraft carrier (Gady, 2019). Its air component consists of 32 J-15 fighters and 12 helicopters, similarly Ka-28/Ka-31/Z-8S/Z-8JH/Z-8AEW (IISS, 2021, p. 251). Although the second carrier's air wing configuration allows for a higher number of J-15 fighter aircraft, neither of them can fully compare with the American *Nimitz* and *Gerald R. Ford* classes of aircraft carriers.

Both aircraft carriers currently in service are further equipped with three 18-cell guided missile launching systems (GMLS) with HHQ-10 (CH-SA-N-17) surface-to-air missiles, two RBU 6000 *Smerch* 2 anti-submarine rocket launchers and the air defence is further complemented by three H/PJ-11 CIWS (IISS, 2023, p. 240).

Not long after the commissioning of the *Shandong*, a third Chinese carrier was launched. The first, or perhaps only unit of a Type 003 class is domestically designed and built and the first Chinese carrier with capabilities expected to rival those of its US counterparts. Unlike the first two carriers, *Fujian* (福建) does not utilize ski-jump to launch its aircraft but employs a catapult system (CATOBAR) and electromagnetic catapults (Rising & Moritsugu, 2022). While this newest carrier represents something of a step change, it is unlikely to be fully commissioned before 2025 (IISS, 2023, p. 222).

Table 1. PLAN aircraft carrier classes and number of units over time

Class	2012	2019	2022	2023
Type 001	1	1	1	1
Type 002	-	1	1	1
Type 003	-	-	fitting out	fitting out
Total	1	2	2	2 (+1?)

(IISS, 2013, p. 289; 2021, p. 251; 2023, pp. 222, 240)

Overall, the development of PLAN's aircraft carrier operations over the past decade can be assessed as steady and incremental, and perhaps even cautious (IISS, 2023, p. 222). The limited amount of carrier-based aviation at the present time may, however, constrain the execution of major amphibious operations, restricting them to areas within the range of land-based air support (Blasko, 2017, p. 12). Beyond the currently used J-15 multirole fighter aircraft, PLAN intends to put into service on its carriers the J-31 fifth-generation fighters (Mehta, 2017, p. 68). However, the stealth-capable J-31

made its maiden flight only in October 2021 (Cenciotti, 2021), and thus cannot be expected to operate from the carriers at full capacity in the immediate future.

Scobell, McMahon, & Cooper (2015, p. 4) argue that the carrier program of PLAN is principally motivated by an "evolving overarching strategic logic" and state that the Chinese demand for carrier capabilities shows "PLA and PLAN thinking and planning beyond a Taiwan scenario." O'Rourke (2022, p. 26) points out, that the carriers would not be "considered critical for Chinese operations in [Taiwan-related conflict] scenarios, because Taiwan is within range of land-based Chinese aircraft" and identifies their main use in a regional scenario that does not involve opposing US forces.

Considering the immense complexity of aircraft carriers and carrier-based operations, the PLAN will need years, likely decades, to match its rivals, be it the US Navy or the Japanese Navy. The disparity between the two counterparts is further deepened by the decades-long head start of the US naval forces in the aircraft carriers' domain, as well as the continuous—including combat—experience.

While the acquisition of aircraft carriers might seem unnecessary in the context of near-seas defence and sea-denial strategies, especially within the areas in close vicinity of mainland China, the PLAN carrier programme might prove useful after these areas have been secured and locked down. As Meraner (2023) points out, aircraft carriers would be indispensable if PLAN were to control the so-called third island chain, stretching from the northern Pacific and extending to Hawaii and New Zealand.

2.1.2 Cruisers

Cruisers represent a very recent development for the PLAN. The Type 055, although officially designated as a destroyer (*ling wu wu xing quzhujian*, 055 型驱逐舰), is—due to its properties—best classified as a cruiser (Caldwell, Freda, & Goldstein, 2020, p. 1), and as such is approached in this thesis.[3]

[3] Type 055 (NATO code name *Renhai* class cruiser) can be specifically described a class of stealth guided-missile cruisers, in Chinese terminology as guided-missile destroyers (*ling wu wu xing daodan quzhujian*, 055 型导弹驱逐舰).

The construction tempo of the Type 055 class cruisers can be described as fast-paced. The first ship of the class, *Nanchang* (南昌),[4] began construction in 2014. She was launched in 2017 and entered active service in early 2020. Between 2017 and 2020, a total of eight Type 055 cruisers were built at two shipyards in Shanghai and Dalian. Of these units, at least six were commissioned by 2022 (Wertheim, 2023). New intelligence further indicates that at least two more cruisers are being built, suggesting the possibility of another batch of eight cruisers (Sutton, 2022). The PLAN could have as many as 16 cruisers in service already by 2030 (Fanell, 2021), with some sources claiming that the class may be extended up to 24 vessels (Mizokami, 2019). In either case, this would represent a major transformation of the large combatant component of the PLAN Surface Force both in qualitative and quantitative terms.

Table 2. PLAN cruiser class and number of units over time

Class	2020	2021	2022	2023
Type 055	1	4	6/7	7 (+1?)
Total	1	4	6/7	**7** (+1?)

(IISS, 2021, p. 252; 2022, p. 258; 2023, p. 240; Wertheim, 2023)

Type 055 cruiser has a full displacement of more than 12,000 tons, a length of 180 meters and a beam of 20 meters, and as such is being described as having been built to accommodate future updates, be it weapons and self-defence systems or other technologies (Caldwell, Freda, & Goldstein, 2020, p. 10). Type 055 is armed with 112 universal vertical launch systems (VLS) missile tubes, 64 forward and 48 aft (Wertheim, 2023). VLS incorporates surface-to-air missiles (SAM) HHQ-9B with a range of more than 100 nautical miles (nm), antisubmarine rockets (ASROC), land attack cruise missiles (LACM), anti-ballistic missile (ABM) interceptors and advanced anti-ship cruise missiles (ASCM) YJ-18 with a 290 nm range (Caldwell, Freda, & Goldstein, 2020, p. 11; Wertheim 2023).

The Type 055 VLS cells also have a larger volume than cells of their American counterparts (*Ticonderoga* class cruiser, *Arleigh Burke*-class destroyer) primarily due to the ability to both "cold-launch" and "hot-launch" missiles (Trevithick, 2022)

[4] While the city of Nanchang, the namesake of the first ship of the class, is not commonly known in the West, in China it is symbolically significant due to it being a birthplace of the People's Liberation Army (Caldwell, Freda, & Goldstein, 2020, p. 5)

The cruiser is further armed with 1 single-barrelled 130-mm gun and a 30-mm H/PJ-11 close-in weapon system (CIWS) mounted forward of the bridge, complemented by a 24-cell HHQ-10 point-defence SAM launcher placed atop the helicopter hangar. In addition, 2 triple 324-mm torpedo launchers are included for short-range antisubmarine warfare (Caldwell, Freda, & Goldstein, 2020, pp. 12-13; Wertheim 2023). The "deceptively large" (Trevithick, 2022) flight deck at the stern of the Type 055 cruiser can accommodate 2 maritime helicopters, be it Harbin Z-9 or the newer Z-20F (Wertheim, 2023).

Overall, the Type 055 guided-missile cruisers are the culmination of China's efforts to build powerful long-range surface combatants and are presently "among the most formidable warships afloat" (Wertheim, 2023). The new large and heavily armed cruisers are typically seen as tools of power projection and—above all—the main escort vessels of the Chinese aircraft carriers (Wertheim, 2023; Sutton, 2022).

In this role, the Type 055 would probably serve as the main air defence command and control platform for the aircraft carrier battle group, similar to the US Navy's Ticonderoga-class cruisers. The expanded weapons magazine size of the PLAN's new cruiser, together with its advanced sensor suite and command and control (C2) capability, would seem to make it uniquely adapted to the role of aircraft carrier escort, particularly during out-of-area naval operations. Moreover, the Type 055 cruisers would also be suitable to form a 'backbone' of both anti-air and anti-submarine formations, given its very high number of VLS, towed sonar, as well as two anti-submarine warfare (ASW) capable helicopters (Caldwell, Freda, & Goldstein, 2020, p. 17-18).

2.1.3 Destroyers

PLAN destroyer force used to be rather varied, made up of a high number of classes consisting of typically only two units (see Table 3). Since 2013, the PLAN destroyer fleet has undergone not only quantitative, but also qualitative transformation—modernisation. As McDevitt (2017, p. 56) points out, the essentially 'experimental' approach towards the development of modern capable destroyers, together with a lack of credible open-source information on the ship's capabilities and performance of their combat systems, has over the years however proved to be an obstacle to study of the Chinese destroyers.

Table 3. PLAN destroyer classes and number of units over time

Class	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Type 956E	4	2	2	2	2	2	2	2	2	2	2
Type 956EM		2	2	2	2	2	2	2	2	2	2
Type 051	6	3	2	2	2	2	2	-	-	-	-
Type 051DT	2	2	2	2	2	2	2	-	-	-	-
Type 051G	2	2	2	2	2	2	2	2	-	-	-
Type 052	2	2	2	2	2	2	2	2	2	2	2
Type 051B	1	1	1	1	1	1	1	1	1	1	1
Type 052B	2	2	2	2	2	2	2	2	2	2	2
Type 052C	3	4	5	6	6	6	6	6	6	6	6
Type 051C	2	2	2	2	2	2	2	2	2	2	2
Type 052D	-	-	1	2	4	6	10	11	14	19	25
Total	24	22	23	25	27	29	33	30	31	36	42

(IISS, 2013, pp. 289-290; 2014, pp. 233-244; 2015, pp. 239-240; 2016, pp. 242-243; 2017, pp. 281-282; 2018, pp. 252-253; 2019, pp. 258-259; 2020, p. 262; 2021, p. 252; 2022, p. 258; 2023, p. 240)[5]

In 2013, at the beginning of the analysed period, the PLAN Surface Force included 24 destroyers of 9 (10) different classes. This was the result of the Chinese "build a little, test a little" approach (McDevitt, 2017, p. 56), that is, design a new class of destroyers, construct a limited number of units of the said class, analyse the flaws, reflect on those in another class, and repeat. In contrast, the 2023 composition of the Chinese destroyers clearly reflects a shift in the design and shipbuilding approach. Out of 42 units, more than half—25—are units of a single class of destroyers, the modern Type 052D class.

Type 051, 051DT & 051G

The 16 original units of the Type 051 class and its later modifications were built in several batches over a twenty-year period between 1971 and 1991. In terms of design, the Type 051 class followed older, early Cold War-era Soviet ships. By the time the production finished in the early 1990s, the Type 051 was comparatively closer to the obsolete World War II vessels, than to the modern destroyers deployed by China's north-eastern Asian neighbours as well as by the United States (McDevitt, 2017, p. 57).

[5] The 2013, 2014, 2015, 2016, 2017, 2018, 2019 issues of Military Balance classify the Type 051, Type 051DT and Type 051G destroyers as frigates. Reclassified as destroyers for the purposes of this thesis.

By the beginning of 2013, the PLAN had 10 destroyers of the Type 051 series in its service, specifically 6 Type 051, 2 Type 51DT and 2 Type 051G (IISS, 2013, pp. 289-290). Out of the total 24, these rather outdated vessels comprised a significant portion of China's destroyers.

The Type 051's main armament consisted of 6 HY-2 anti-ship missiles in 2 triple launchers, 6 324mm anti-submarine torpedoes (either B515 or Yu-2) in 2 triple tubes, and 2 twin 130 mm guns, one fore and one aft. Other pieces of equipment varied considerably from ship to ship, primarily due to successive, partial modernisation programmes (Saunders, 2009, p.139).

With the full load displacement of mere 3700 tons, the Type 051 proved to be relatively small and ill-suited for blue-water deployment. The issue was only exacerbated by limited fuel-storage capacity and difficulties with underway replenishment on high seas (McDevitt, 2017, p. 57).

Similarly problematic was the Type 051's steam propulsion. Not only was the ship's steam propulsion plant too manpower intensive, both to operate and to maintain (Tate, 2019), but the machinery produced too much self-noise, rendering the sonar systems ineffective. This, however, provided the PLAN with valuable experience, making it move towards gas turbine or combined diesel–gas turbine propulsion, which in not only quieter but also more reliable, easier to maintain and has better overall performance (McDevitt, 2017, p. 57). These problems were underscored by various hull construction deficiencies, poor welding, inoperable machinery, and many other issues (Kirchberger, 2015, p. 184).

The Type 051DT and Type 051G destroyers, in total 4 ships, were upgraded versions, armed with 16 YJ-82/83 antiship missiles in 4 quadruple launchers, and HQ-7 surface-to-air anti-air missile in 1 octuple launcher (IISS, 2013, p. 289). Even despite these upgrades, the Type 051 series classes had very limited capabilities, especially compared to the more modern destroyers entering service in the 2010s (Tate, 2019).

Although the remaining Type 051 destroyers were further reduced between 2013 and 2015, the last 6 units remained in service until the beginning of the third decade of this century. In May 2019, the PLAN decommissioned four Type 051 destroyers (Tate, 2019), the last two Types 051 and the last two Types 051DT. The final two Type 051G destroyers were decommissioned only later in 2020 (Zhao, 2020).

Type 052

The introduction of Type 052 foreshadowed a gradual shift towards more modern destroyer designs (McDevitt, 2017, p. 57). However, while the development of the Type 052 class began already in the 1980s, the US/EEC arms embargo against China following the 1989 Tiananmen Square massacre had a crippling impact on the development programme. The sudden unavailability of key components, including combat systems, propulsion technologies and advanced missiles, resulted in the construction of only two units of this class (Kirchberger, 2015, p. 186). Having been commissioned in 1994 and 1996 (Saunders, 2009, p. 138), both ships currently continue to be in service (IISS, 2023, p. 240).

The Type 052 class destroyers are armed with 16 YJ-83 anti-ship missiles in 4 quadruple launchers, HHQ-7 surface-to-air missiles in 1 octuple launcher, further are equipped with 2 triple 324mm anti-submarine torpedo tubes with Yu-7 lightweight torpedoes, 2 FQF 2500 antisubmarine mortars, 2 H/PJ-12 CIWS, and 1 twin 100mm gun. Unlike its predecessors, the Type 052 has also a flight deck and a hangar and can accommodate two Z-9C helicopters (IISS, 2023, p. 240). The ships' YJ-83 missiles also allow for an engagement at a greater range of 150 km, compared to the 95 km of YJ-82 or HY-2 missiles of the preceding destroyer classes (Saunders, 2009, pp. 138-140).

While Type 052 represents an overall step ahead, its war-fighting capability could be compromised in the event of conflict due to system integration challenges and lack of 'vendor support' for the imported foreign-made systems (Kirchberger, 2015, p.189). Considering the PLAN's practise of retiring surface vessels after approximately 30 years (Kirchberger, 2015, p. 185), it is reasonable to assume that both units of Type 052 will be decommissioned between the years 2024–2026, very likely no later than the end of the decade.

Sovremenny (Type 956E & Type 956EM)

After the US intervention in the mid-1990s Taiwan Strait Crisis, the Chinese leadership became convinced that the PLAN must possess some countermeasures against a possible carrier strike group intervention in Chinese waters. This resulted in a purchase

of two Sovremenny class destroyers from Russia in 1997, and another two in 2002 (Pradt, 2016, p. 32).[6]

These new four destroyers, gradually commissioned into service in 1999, 2001, 2005 and 2006 (Saunders, 2009, p. 135), represented an important milestone in China's naval capabilities, especially in terms of carried combat systems (Kirchberger, 2015, p.189). Since their acquisition, the destroyers continue to be upgraded with newer, indigenously designed armament and can be thus expected to adequately fulfil their roles at least until the end of the decade, possibly early 2030s.

In 2013 all Type 956E/M destroyers were equipped with 2 quadruple launchers with 3M80/3M82 Moskit anti-ship missiles, 2 3K90 Uragan SAM launchers, 2 twin 533mm antisubmarine torpedo tubes, 2 RBU-1000 Smerch-3 anti-submarine rockets launchers, and 2 twin 130 mm guns (IISS, 2013, p. 289). While the Moskit missiles, capable of engaging targets at considerably long range (up to 210 nm) and high speed (Mach 3), noticeably strengthened the PLAN destroyer force, the SAM as well as the anti-submarine warfare capabilities were at best mediocre and limited the ships' operational radius to areas under PLA's land-based air cover (McDevitt, 2017, p. 62).

Presently, the two Type 956E destroyers have been refitted modern YJ-12A anti-ship missiles, 4 eight-cell vertical launch systems (VLS) capable of incorporating either HHQ-16 SAM or Yu-18 anti-submarine missiles, and 2 triple 324mm anti-submarine torpedo tubes with Yu-7 light-weight torpedoes, (IISS, 2023, p. 240), somewhat ameliorating their deficiencies.

In contrast, the other two Type 956EM destroyers have been fitted out with updated Moskit-E anti-ship missiles, and 2 single 3S90E launchers with 9M38E M-22E Shtil surface-to-air missiles (IISS, 2023, p. 240). All 4 units of both classes also have a helicopter flight deck aft, with a capacity for one Harbin Z-9C or Kamov Ka-28 (Saunders, 2009, p. 135). The formidable anti-surface warfare (ASUW) capabilities of *Sovremennys* combine especially well with the anti-air capabilities of the more modern Type 052(C/D) destroyers (Koda, 2017, p.33).

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[6] The first two destroyers were Pr. 956E class, or respectively Type 956E class, while the two units purchased in 2002 were of the more advanced Pr. 956EM, or respectively Type 956EM class (Kirchberger, 2015, p. 189).

Type 051B

As of 2023, the single Type 051B class destroyer remains in service (IISS, 2023, p. 240). The Type 051B was the first class of destroyers that went into production simultaneously with the Type 956 procurement program already underway. Although Type 051B can be perceived as an incremental improvement over the preceding Type 051 class, only one ship was built before the class was discontinued. This was most likely due to the performance of the ship having been deemed unsatisfactory (Kichberger, 2015, p. 193).

While the Type 051B shared broad similarities with the Type 051 (Saunders, 2009, p. 137), initially even in terms of armament, namely anti-ship missiles and air-to-surface missiles (IISS, 2013, p. 289), the Type 051B differs in size, being considerably larger, with full load displacement of 6000 tons (Saunders, 2009, p. 137), and has been designed with a reduced radar cross-section profile (Pradt, 2016, p. 33). Currently, Type 051 is equipped with YJ-12A anti-ship missiles in 4 quadruple launchers, and 32 H/AJK-16 VLS cells, capable of launching HHQ-16 surface-to-air missiles or Yu-8 anti-submarine missiles (IISS, 2023, p. 240), somewhat enhancing its combat capabilities in those respective areas.

Having been commissioned in January 1999 (Saunders, 2009, p. 137), *Shenzen* (深圳), the only ship of the class, can be expected to stay in service until 2029–2030.

Type 052B

The Type 052B class represented PLAN's first truly modern destroyers, however by the time the first ship was commissioned, it was already outdated (McDevitt, 2017, pp. 57-58). The class was based on Type 052, but with further improved stealth features (Saunders, 2009, p. 136). The ships of the class were equipped with 4 quadruple launchers with YJ-83 anti-ship missiles, 2 single 3S90E launchers with 9M317E Shtil-1 SAM, 2 triple 324mm anti-submarine torpedo tubes with Yu-7 light-weight torpedoes, 2 H/PJ-12 CIWS, and 1 100mm gun, are reportedly undergoing a refit (IISS, 2023, p. 240), and would thus deserve closer attention in the future.

Although the Type 052B's Russian anti-air missiles improved, at the time, relatively poor Chinese anti-air warfare capabilities (Kirchberger, 2015, p. 195), their short range limited effective defence radius to the ships themselves (McDevitt, 2017, p. 58).

Only two ships of the Type 052B class were built, both commissioned in July 2004 (Saunders, 2009, p. 136) and can be expected to stay in service until the early to mid-2030s. Although the class served mainly served as an intermediate stage between older and more modern designs after the refit it could remain an effective part of the PLAN destroyer force.

Type 052C & Type 051C

The Type 052C marked an important step in the development of PLAN destroyers, chiefly in weapons and sensor technology (Kirchberger, 2015, p. 195). The Type 052C class destroyers are equipped with 2 octuple launchers with YJ-62 anti-ship missiles, 8 6-cell VLS with HHQ-9 surface-to-air missiles, 2 triple 324mm anti-submarine torpedo tubes with Yu-7 lightweight torpedoes, 2 H/PJ-12 close-in weapon systems, and 1 100mm gun (IISS, 2023, p. 240). The anti-air missiles are controlled by an indigenous phased-array radar system, an introduction which makes China consistent with the trend followed by most advanced naval shipbuilding nations (Kirchberger, 2015, p. 197).

While the first two ships of the class were commissioned in 2004 and 2005 (Saunders, 2009, p. 137), the production continued only after an eight-year hiatus (McDevitt, 2017, p. 59). In 2013, the PLAN had 3 Type 052C destroyers in service (IISS, 2013, p. 289). Further three units were commissioned, and as of 2023, 6 Type 052C class destroyers are in service (IISS, 2023, p. 240).

Simultaneously with the Type 052C, a modernised version of the 051 series was also introduced. The Type 051C class, although incorporating some similar systems as the more modern Type 052C class (phased-array radar system, VLS), is in many respects less advanced. Namely, the Type 051C had no organic helicopter and relies on steam propulsion (Kirchberger, 2015, p. 195).

While the Type 051C class further improves on the preceding Type 051B, only two units of this class were built, and commissioned in 2006 and 2007 (Pradt, 2016, p. 33). Together with the early Type 052C, in total 4 destroyers can be expected to serve until at least 2034, in the case of the second batch (other 4) of the Type 052C destroyers early to mid-2040s respectively. These represent the latest development stage before the newest, mass-produced destroyer class.

Type 052D

In September 2012, the official Chinese media published an article revealing that a new destroyer, Type 052D, a successor to the Type 052C class, was under construction. The new ship class was likened to the sophisticated 'Aegis' destroyers (such as the US *Arleigh Burke*-class) and described with a focus on its anti-air role (McDevitt, 2017, p. 61). The first ship of the Type 052D class, the lead ship *Kunming* (昆明), was thereafter commissioned in March 2014 (Keck, 2014a). The new class emerged contrary to the expectation of many Western expert assessments claiming that China had slowed or completely halted the production of larger surface combatants (Yoshihara & Holmes, 2012).

At the beginning of 2019, PLAN already had commissioned 10 Type 052D destroyers (2019, IISS, p. 259), making it the most numerous destroyer class in service. In May of the same year, the 19th and 20th ship of the class was already launched on water, ready to be fitted out (Gady, 2019), underscoring the unprecedented speed of production.

Since 2020, new modification of the Type 052D, so-called Type 052DL class ships are being introduced into service. The Type 052DL version ships are notably longer, allowing them to accommodate the newer Z-20 helicopters (militarywatchmagazine.com, 2020).

Both the standard Type 052D and the modified, elongated version Type 052DL, are armed with a 64-cell missile vertical launch system (VLS) that is complemented by a four-panel Type 346A multifunction phased-array radar system, offering comprehensive anti-ship, air-defence, and in future possibly land-attack cruise-missile capabilities (Wertheim, 2020a). The VLS launchers can be fitted with YJ-18A anti-ship missiles, HHQ-9B surface-to-air missiles and Yu-8 anti-submarine missiles (IISS, 2023, p. 240). Considering this wide range of available weaponry and capabilities, the Type 052D may be considered PLAN's first full-fledged, dedicated multirole destroyer (Li, 2017, p. 44). Its main armament is further complemented by a 24-cell guided missile launching system (GMLS) with HHQ-10 surface-to-air missiles, 2 triple 324mm anti-submarine torpedo tubes with Yu-7 lightweight torpedoes, 1 H/PJ-12 close-in weapon system (CIWS) and 1 130mm gun at the bow of the ship (IISS, 2023,

p. 240). The ship's antisubmarine warfare (ASW) capabilities could be further strengthened by the ship-borne Harbin Z-20 helicopters (Gady, 2019).

Future developments

At the beginning of 2023, IISS (2023, p. 240) reported 25 Type 052D (including modified version) destroyers were already in PLAN's service. In late 2022, images published online showed 5 hulls of Type 052D destroyers in various stages of construction being built simultaneously in a single shipyard (Vavasseur, 2022a). In March 2023, two of those five (reportedly 27th and 28th destroyers) were launched (Ozberk, 2023). Another "at least one" was being built in a shipyard near Shanghai (Vavasseur, 2022a).

2.1.4 Frigates

During the 2013 – 2023 period, the PLAN frigate fleet underwent a significant qualitative transformation accompanied by substantive quantitative change, as the total number of frigates decreased by a third (see Table 4). The past decade saw the decommissioning of all but three newest classes of frigates, the Type 053H3, and the modern Type 054 and Type 054A.

Table 4. PLAN frigate classes and number of units over time

Class	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Type 053H	8	2	2	2	3	2	-	-	--	-	-
Type 053H1	5	6	6	6	6	6	6	3	2	1	-
Type 053H1G	6	6	6	6	6	6	6	6	4	4	-
Type 053H2	3	1	1	1	1	1	1	1	-	-	-
Type 053H1Q	1	1	1	1	1	1	-	-	-	-	-
Type 053H2G	4	4	4	-	-	-	-	-	-	-	-
Type 053H3	10	10	10	10	10	10	10	8	8	8	8
Type 054	2	2	2	2	2	2	2	2	2	2	2
Type 054A	13	15	16	20	22	25	28	30	30	30	31
Total	62	54	54	54	57	59	59	51	46	40	41

(IISS, 2013, p. 289; 2014, pp. 233-234; 2015, p. 240; 2016, p. 243; 2017, pp. 281-282; 2018, pp. 252-253; 2019, p. 259; 2020, p. 262; 2021, p. 252; 2022, p. 258; 2023, p. 240)

In 2013, the PLAN had at its disposal 8 Type 053H class frigates, 6 Type 053H1 class frigates, 6 Type 053H1G class frigates, 3 Type 053H2 class frigates, 1 Type 053H2

class frigate and 4 Type 053H2G class frigates, all of which—by 2023—are decommissioned.

The Type 053 series was a family of frigate classes, whose construction first began in mid- 1970s (Saunders, 2009, p. 144). The Type 053H frigates were armed with 6 SY-1 anti-ship missiles in 2 triple launchers, 4 RBU 1200 antisubmarine rocket launchers and 2 100mm guns. The armament of the Type 053H1 class differed only in terms of main anti-ship weaponry, as the SY-1 was replaced by HY-2, albeit also in a 2-triple-launcher configuration (IISS, 2013, p. 289). Units of these classes were arguably "obsolete or nearly obsolete" (Kirchberger, 2015, p. 206). This assessment was also proven true by the fact that while the Type 053H1 frigates, built in the 1980s, were expected to "reach the end of their maximum service lives by the mid-2020s," (Kirchberger, 2015, p. 161), most of them were already decommissioned before the end of the year 2020, suggesting their considerable unsuitability for modern warfare. As IISS (2021, p. 232) noted, by 2021, the handful remaining Type 053H1/H1G frigates were relegated to coastal patrol taskings. Their complete decommissioning in 2022, thus, was not a surprise.

The 6 ships of the Type 053H1G and 3 ships of the Type 053H2 class that were still in service in 2013, and were gradually decommissioned by 2022, were also armed in the same manner as the H/H1 variants, except for the anti-ship missiles. The Type 053H1G was equipped with 8 YJ-82/83 missiles in 2 quadruple launchers, while the Type 053H2 class utilized the configuration of 4 twin launchers with the same number of missiles (IISS, 2013, p. 289).

The Type 053H1Q class was somewhat unique, as it had the capacity to accommodate 1 Harbin Z-9C helicopter on the rebuilt aft of the ship, now with a flight deck and a hangar (Saunders, 2009, p. 147). The single unit of the class was armed with 1 triple launcher with HY-2 anti-ship missiles, 4 RBU 1200 anti-submarine rocket launchers and 1 100mm gun at the bow of the ship. However, before its decommissioning, the ship was utilized for training purposes (IISS, 2018, p. 252).

The four frigates of Type 053H2G class, commissioned between the years 1991–1994 (Saunders, 2009, p. 142) were armed with 6 YJ-83 anti-ship missiles in 2 triple launchers, 2 RBU 1200 anti-submarine rocket launchers and 1 100mm gun, and their capabilities were strengthened by an addition of one sextuple launcher with HQ-61

surface-to-air missiles and a flight deck with the capacity for 2 Z-9C helicopters (IISS, 2015, p. 240).

Even though the Type 053H2G was one of the four new indigenously built frigate classes (O'Rourke, 2015, p. 30), and despite the incremental improvements it had over the previous, older classes of frigates, all four ships of the Type 053H2G class were decommissioned already by the year 2015 (see table 4 above).

One of the three classes of frigates currently in PLAN active service, and the last remaining Type 053 series class, is the Type 053H3. It is a class of multi-role missile frigates designed for coastal patrol, surface strike and anti-submarine warfare missions. Between 1998 and 2005 a total of 10 units were commissioned into service (Pradt, 2016, p. 34). In 2013, the class was equipped with 2 quadruple launchers with YJ-82/83 anti-ship missiles, 1 octuple launcher with HHQ-7 surface-to-air missiles, 2 RBU 1200 anti-submarine rocket launchers, and 1 twin 100mm gun. Furthermore, it can accommodate a Z-9C helicopter. Since then, 6 units of the class were refitted and their air defence capabilities were improved by HHQ-10 surface-to-air missiles (IISS, 2013, p. 289; 2023, p. 240).

The class currently consist of 8 ships out of the original 10, as 2 vessels were sold to Bangladesh in 2019 (Dominiguez, 2019). Despite this partial decrease from the original state, the Type 053H3 class frigates can be expected to be an active part of the PLAN surface force at least until 2030, with the last units remaining in service possibly until after 2035.

The two most modern classes of frigates are the Type 054 and Type 054A. The Type 054 class is a new design (Saunders, 2009, p. 140), that incorporates numerous signature-reduction features (Wertheim, 2020b), improving its stealth qualities. Type 054 is equipped with 8 YJ-83 anti-ship missiles in 2 quadruple launchers, 1 24-cell guided-missile launching system (GMLS) with HHQ-10 surface-to-air missiles, 2 triple 324mm antisubmarine torpedo tubes with Yu-7 lightweight torpedoes, 2 RBU 1200 anti-submarine rocket launchers, 4 AK630 CIWS and 1 100mm gun. The ships of the class can further accommodate 1 Ka-28 Helix A or 1 Z-9C helicopter (IISS, 2023, p. 240). As such, the Type 054 class represents a significant step up in terms of armament and versatility compared to the older frigate designs.

While Type 054 class consists of only two units, commissioned in 2005 and 2006 (Saunders, 2009, p. 140), and was followed up by a much more numerous Type 054A class. The newer class design shares its predecessor's signature-reduction hull form and further ads a 4 8-cell surface-to-air missile vertical launch system (VLS), a smaller (76 mm) deck gun, and 2 H/PJ-11/12, a more advanced close-in weapon system (CIWS). Because of these and other enhancements, the newer Type 054A became the preferred ship to replace the older frigates (IISS, 2023, p.240; Wertheim, 2020b). Unlike the Type 054, the Type 054A is armed with 2 FQF 3200 anti-submarine rocket launchers. Besides HHQ-16 surface-to-air missiles with a range of 40 nautical miles (Wertheim, 2020b), the VLS can also incorporate Yu-8 anti-submarine missiles (IISS, 2023, p. 240).

In the past decade, the number of Type 054 class frigates in PLAN's active service has grown almost threefold, from 13 to 31 (see Table 4), confirming Kirchberger's (2015, p. 208) assessment, that the class will "form the backbone of Chinese future frigate fleet". In August 2021, a 32nd Type 054A frigate was launched (Tate, 2021), suggesting that the production has not finished after 31 hulls. While these vessels are designed to operate primarily in littoral waters, they have proved the ability to perform well even during extended operations, such as in the Gulf of Aden (Cole, 2017, p. 23).

It should be also noted, that as of late January 2023 a new hull, widely assumed to be the next generation frigate, has commenced its final assembly. The new vessel is being so far informally referred to as Type 054B or Type 057. Based on the ship's size, its displacement could be almost 50 % larger than that of the Type 054A class and its width would rival that of a Type 052D class destroyer (Luck, 2023). Due to the early stage of construction, no definite conclusions can be drawn about the ship's loadout. However, the new vessel is reportedly intended to be a "low-end anti-submarine ship working along the high-end Type 055 cruisers and Type 052 destroyers" (Honrada, 2023).

2.2 Patrol and Coastal Combatants

2.2.1 Corvettes

Type 056 and Type 056A classes are the two new and only classes of corvettes in PLAN.[7] First of these vessels entered active service only in 2013 and the last, the 72nd, corvette was commissioned in 2021 (O'Rourke, 2022, p. 32). The rate of construction can be described as unprecedented in Chinese shipbuilding. Between 2013 and 2022, each year saw commissioning on average of more than 7 corvettes.

Table 5. PLAN corvette classes and number of units over time

Class	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Type 056	6	8	15	18	19	21	21	21	22	22	-
Type 056A	-	-	-	4	8	16	20	22	33	50	50
Total	6	8	15	22	27	37	41	43	55	72	50

(IISS, 2013, p. 253; 2014, p. 234; 2015, p. 240; 2016, p. 243; 2017, p. 282; 2018, p. 253; 2019, p. 259; 2020, p. 262; 2021, p. 252; 2022, p. 259; 2023, p. 240)

Between 2022 and 2023, the total amount of corvettes however decreased by 22. This was due to a transfer of all 22 ships of the Type 056 class to the China Coast Guard, likely motivated by the class's lack of a towed-array sonar and thus inadequate anti-submarine warfare (ASW) capabilities (O'Rourke, 2022, p. 33). Apart from this transfer, the number of corvettes has steadily grown at high rate, demonstrating the high shipbuilding potential.

The rapid launch of the first six corvettes within six months in 2012 was a sign of pressing near-seas concern within the PLAN, as the Type 056 was intended to replace the outdated frigate classes and give China greater control over its coastal areas and nearby enclosed seas, where the small new vessels could operate well within their capabilities (IISS, 2013, p. 253). Namely, it would excel in offshore operation inside the first island chain (Wertheim, 2022).

While the Type 056 was designed with the intention to close China's long-standing gap in anti-submarine warfare (ASW) capability, a weakness that many countries in

[7] Corvettes, in terms of displacement, fall between the smaller, lighter fast-attack crafts or missile boats, and the heavier frigates. Typically, corvettes displace one thousand tons or more (Blasko, 2017, p. 13)

the region are attempting to exploit by acquiring attack submarines (IISS, 2013, p. 253), the base version lacked any kind of sonar system, critical for performing ASW tasks (navalnews.com, 2021). The Type 056 can be seen as an effective replacement to be for the rapidly aging Type 037 patrol craft and part of larger overhaul of the littoral fleet (IISS, 2014, p. 208).

Type 056 is a smaller vessel; its length is 89 meters; the beam is 11 meters and the draft mere 4,4 meters. The total displacement is approximately 1360 tons. The corvette features an up-to-date stealthy hull design, integrating sloped surfaces and a compact superstructure (naval-technology.com, 2020).

As Type 056 was until its transfer to China Coast Guard, the Type 056A class is primarily armed with four YJ-83 anti-ship missiles carried amidship, allowing them to strike surface targets up to the range of 97 nm. They are further equipped with 2 triple 324-mm torpedo tubes with Yu-7 lightweight torpedoes, and point defence is ensured by an 8-cell FL-3000N surface-to-air missile launcher with HHQ-10 SAM (IISS, 2023, p.240; Wertheim, 2022).

Although a single naval helicopter can operate from the landing deck at the ship's aft, the Type 056A class has no organic hangar. Furthermore, the ship is fitted with a single 76 mm gun at the bow, and 2 remotely operated 30 mm guns, one mounted on the port and starboard side each (Wertheim, 2022).

Aside from the ASW duties, the Type 056 corvette augments the Type 022 missile boat in the fleet. Unlike the missile boat, the corvettes provide the PLAN with the capability to patrol littoral waters for several days or weeks at a time (Blasko, 2017, p. 2), and may be further used as a suitable escort for larger vessels in coastal waters (Cole, 2017, p. 24).

Having solved the ASW inadequacies present in the original Type 056 design, the PLAN has clearly decided for the 056A to serve as the core of its corvette fleet. Given the timespan during which the majority of the Type 056A corvettes were commissioned, it can be reasonably expected that they will remain in active service at least until the years 2045–2050, possibly even a few years in the second half of the 21st century. However, as Murphy & Roberts (2018, p. 77) point out, even despite the introduction of ASW-focused corvettes, the PLAN anti-submarine capabilities overall remain rather poor.

2.2.2 Missile Boats

In 2013, *The Military Balance* (IISS, 2013, p. 290) listed four classes of missile boats in the inventory of PLAN: Type 021, Type 022, Type 037II and Type 037IG.[8] However, as Blasko (2017, p. 2) points out, by 2013, the Type 021 missile boats were most likely already retired and should have not been included in the inventory of active vessels of the PLAN.

Table 6. PLAN missile boat classes and number of units over time

Class	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Type 021	11	11	11	-	-	-	-	-	-	-	-
Type 022	65+	65+	65+	65+	ε65	ε65	ε60	ε60	ε60	ε60	ε60
Type 037II	6	6	6	6	6	6	6	6	6	6	4
Type 037IG	20	20	20	22	20	20	20	20	18	18	18
Total	102+	102+	102+	93	91	91	86	86	84	84	82

(IISS, 2013, p. 290; 2014, p. 234; 2015, p. 240; 2016, p. 243; 2017, p. 282; 2018, p. 253; 2019, p. 259; 2020, p. 262; 2021, p. 252; 2022, p. 259; 2023, p. 240)

Thus, during the selected period, the core of the PLAN missile boat fleet was and continues to be, formed by the Type 022 missile boats. These are complemented by older and less numerous Type 037II and Type 037IG classes.[9] During the ten years under analysis, the number of missile boats in service remained highly stable. The mild numerical decrease in the total number of vessels, as can be observed in the table above, is caused by two issues of a 'bookkeeping' nature and does not accurately represent the real situation. First, the already mentioned undue counting of the Type 021 class missile boats in 2013-2015 issues of *The Military Balance*, and second, the gradual correction of the estimated number of the Type 022 class missile boats.

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[8] The Military Balance (IISS, 2013, p. 290) classifies Type 021 and Type 022 specifically as PCFG (patrol crafts, fast, with guided missiles), and Type 037II and Type 037IG as PCG (patrol crafts, with guided missiles).

[9] The missile-craft force of the PLAN consists of variety of small vessels with displacement of 500 tons and less. In Chinese these are called 导弹快艇 (daodan kuaiting), sometimes shortened to 导弹艇 (daodanting) or just 快艇 (kuaiting), which are typically (often loosely) translated as "patrol boat," "patrol craft," "missile fast-attack craft," "fast-attack craft," "missile escort boat," "missile speedboat," "missile boat," or "fast boat." (Blasko, 2017, p. 1). In this thesis, the term "missile boat" is used, as it accentuates the vessels' primary role and does place limitations upon the category based on vessels' speed.

The Type 022 class missile boats were first introduced in 2004, and their building apparently stopped by 2009 after production of about 60 units (O'Rourke, 2013, p. 30). The high-paced construction rate suggests the acquisition of these vessels was of high priority (Patch, 2010).

The Type 022 class missile boats have wave-piercing catamaran hulls, a maximum speed of 36 knots and an operational range of up to 300 nm (Li, 2017, p. 43). The 43-meter-long boats have a full displacement of mere 250 tons, very shallow draft and utilize water-jet propulsion, allowing for very high speed (Kirchberger, 2015, p. 209). The boats incorporate stealth features, which reduce radar, visual, acoustic, infrared, and electronic emission signatures, making them hard to detect (Li, 2017, p. 43; Pradt, 2016, p. 35).

The Type 022 missile boats are equipped with 8 YJ-83 anti-ship missiles in two quadruple launchers, forming the boat's main armament, and one H/PJ-13 close-in weapon system (CIWS), providing point-defence against incoming missiles (IISS, 2023, p. 240). The anti-ship missiles' maximum range of 100 nm may be utilized due to the datalink antenna that can receive off-board sensors for over-the-horizon targeting information (Li, 2017, p. 43).

While these small vessels are "ideal for littoral warfare in confined and shallow waters such as the East China Sea and the Yellow Sea" and could thus play "a critical role in asymmetric warfare scenarios, e.g., during possible conflicts over Taiwan, the Senkaku/Diaoyutai islands, or in the South China Sea" (Kirchberger, 2015, p. 210), their stable numbers suggest that the PLAN is satisfied with the amount of Type 022 currently in service.

The Type 022 missile boats are a key element of PLAN's sea-denial capabilities, as they "[make] it more dangerous for enemy surface vessels to conduct combat operations within a few hundred miles of China" (Blasko, 2017, p. 12). With their relatively low age, these vessels will likely remain in service until the 2040s, possibly mid-century.

The other two missile boats in PLAN inventory are the somewhat older Type 037-II and Type 037-IG classes. These are based on Type 037 class submarine chasers and were first introduced in the 1990s (Blasko, 2017, p. 2). Both classes are armed with

YJ-8 anti-ship missiles, the Type 037-II in two triple launchers (6 missiles) and the Type 037IG in two twin launchers (4 missiles) configuration (IISS, 2023, p. 240).

As seen in Table 6 above, the first two units of each of these two classes were decommissioned by 2020 and 2022 respectively. This may suggest the beginning of gradual phasing out of these vessels out of service, as they will begin to reach their 30-year lifespans during this decade.

Although a small number of units could see service even in the 2030s, if not replaced by newer types of missile boats in time, this would eventually mean an overall decrease in the total number of missile boats and a structural change of significant segment of the PLAN.

2.2.3 Patrol Crafts & Boats

The PLAN Surface Force has traditionally maintained a relatively large amount small patrol crafts and boats of several different classes. *The Military Balance* (IISS, 2013, p. 290) listed four classes of these vessels, Type 037, Type 037I, Type 037IS and Type 062I.[10] Over the course of the 2013–2023 period, these types of vessels underwent not only a significant reduction in numbers but essentially disappeared completely from the PLAN inventory. From more than 109 vessels in service in 2013, only about 10 remain as of 2023 (see Table 7).

Table 7. PLAN patrol crafts and boats classes and number of units over time

Class	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Type 037	50	48	48	30	30	30	30	30	some	some	-
Type 037I	3	2	2	2	2	2	2	2	some	some	-
Type 037IS	22	22	22	18	17	16	16	16	ε8	ε8	some
Type 062I	34+	34+	34+	34+	ε40	ε30	ε30	ε32	ε32	ε32	<10
Total	109+	106+	106+	84+	89	79	79	81	40+	40+	ε10

(IISS, 2013, p. 290; 2014, p. 234; 2015, p. 240; 2016, p. 243; 2017, p. 282; 2018, p. 253; 2019, p. 259; 2020, pp. 262-263; 2021, pp. 252-253; 2022, p. 259; 2023, p. 240)

The Type 037 class coastal patrol craft were of older design; the programme began already in the 1960s. The vessels had a displacement of almost 400 tons, were almost

[10] The Type 037, Type 037I and Type 037IS are listed as PCC (patrol craft, coastal), while the Type 062I as PB (patrol boat). These categories are followed in this thesis.

60 meters long and had a range of 1300 kilometres at 15 knots speed (Saunders, 2009, p. 150). The Type 037 class was armed with 4 RBU 1200 *Uragan* anti-submarine mortars, and 2 twin 57 mm guns (IISS, 2020, p. 263). They were further fitted with 18 depth charges in 2 racks and 2 BMB 2 depth charge projectors (Saunders, 2009, p. 150).

The less numerous Type 037I class was equipped in a similar fashion (IISS, 2020, p. 263), with the only notable difference being the slightly longer hull, as the class was likely a prototype for missile boats of the Type 037IG class (Saunders, 2009, p. 149).

Type 037 IS were armed with 2 FQF-3200 anti-submarine mortars (IISS, 2022, p. 259); these large anti-submarine mortars suggested the predominantly anti-submarine warfare (ASW) role of the class (Saunders, 2009, p. 150). This was, however, a commonality shared by all vessels of Type 037, Type 037I and Type 037IS classes, as they played the important role of "submarine chasers" (Erickson, Murray, & Goldstein, 2009, p. 26), a type of a ship whose primary task is to counter and 'chase down' submarines.

As the more modern classes of ships were introduced in the first two decades of the 21st century, often equipped with dedicated anti-submarine weaponry, in some cases even VLS purposed anti-submarine rockets (ASROC), the need for older designs of submarine chasers naturally declined. The virtual disappearance of Type 037, Type 037I and Type 037IS patrol crafts during the analysed ten-year period is the outcome of this trend. Although it could be viewed as a significant numerical reduction, it would be more appropriate to perceive this as a qualitative transformation of the anti-submarine warfare element of the PLAN surface force and generally a part of the modernisation process.

Similarly, the Type 062-I class gunboats have been decommissioned *en masse*, most notably in the last two to three years. The last up to 10 units in service (IISS, 2023, p. 240) are 40 meters long, 170 tons heavy vessels armed only with 2 twin 37 mm guns and several lighter weapons (Saunders, 2009, p. 151).

These patrol boats, first built in 1992 (Saunders, 2009, p. 151) are being decommissioned after almost precisely thirty years, as their roles and coastal patrol duties can be more than comfortably overtaken by modern vessels, especially the smaller Type 056 corvettes.

2.3 Amphibious Warfare Vessels

2.3.1 Landing Helicopter Docks

The Type 075 landing helicopter dock is a completely new type of vessel for the PLAN. China has ever built or fielded such a ship in history, and although the Type 075 does not introduce many dramatically new individual systems on its own, it can be considered a revolutionising element of the Chinese navy (Kennedy & Caldwell, 2022, p. 11). As of 2023, three units have been commissioned (see Table 8 below).

Table 8. PLAN landing helicopter dock classes and number of units over time

Class	2020	2021	2022	2023
Type 075	-	2	3	3
Total	-	2	3	3

(IISS, 2022, p. 259; 2023, p. 240; Kennedy & Caldwell, 2022, p. 10)

The first ship of the class, *Hainan* (海南), was commissioned in April 2021, and the second, *Guangxi* (广西), was commissioned already in December of the same year. The third landing helicopter dock, the *Anhui* (安徽), entered service in October 2022. These three ships very built in record time, with one being launched every 6 months (Vavasseur, 2022b), showcasing high capacity of the Chinese shipbuilding industry.

Type 075 is a class of landing helicopter docks (LHD), a sub-type of so-called amphibious assault ships, that provide the PLAN with a wide range of new options and capabilities.[11] The Type 075 is 237 meters long and displaces approximately 40 000 tons (Farley, 2020). The flight deck span over the entire length of the ship and is served by two aircraft elevators positioned inside the hull on the stern and forward section of the deck. The hull of the ship further incorporates radar cross-section reduction (stealth) features (Kennedy & Caldwell, 2022, p. 8).

To provide air support, the main purpose of the ship (Kennedy & Caldwell, 2022, p. 5), Type 075 is estimated to have enough capacity for 28 helicopters (IISS, 2023, p. 240). It should be noted that the Chinese military yet lacks either a STOVL fighter or

[11] Amphibious assault ships, or helicopter carriers, are large warships with landing/flight deck for several helicopters, a car deck, heavy duty goods lifts, davits (small cranes) for landing craft and rigid hull inflatable boats and a dock for landing craft (Kirchberger, 2015, p. 73).

transport aircraft (Farley, 2020), which—at the present time—limits the use of the LHD-type ship's deck to helicopters.

The Type 075 class is armed with 2 24-cell guided-missile launching systems (GMLS) with HHQ-10 surface-to-air missiles (SAM) and 2 H/PJ-11 (IISS, 2023, p. 240) or possibly H/PJ-14 (Kennedy & Caldwell, 2022, p. 14) close-in weapon systems (CIWS). Given the combat role of the ship, it lacks offensive weaponry such as anti-ship missiles.

The IISS (2023, p. 240) further estimates that Type 075 has a capacity for 3 Type 726 LCACs, 800 troops, as well as at least 60 armoured fighting vehicles (AFV). While the precise carrying capacity is difficult to observe, available footage suggests that there is sufficient vehicle space for PLAN Marine Corps (PLANMC) company-sized units (e.g., amphibious mechanized infantry company) with additional platoon-sized elements, such as tanks or self-propelled artillery (Kennedy & Caldwell, 2022, pp. 15-18).

Although the Type 075 LHDs are popularly characterised as the tools necessary for China be able to invade Taiwan (Axe, 2021), and they would likely be of value in Taiwan-related conflict scenarios (O'Rourke, 2022, p. 35), their possible uses and roles are far greater.

As Kennedy & Caldwell, (2022, p. 4) point out, the roles the Type 075 will play must be understood "in the context of the PLAN's larger strategic transformation and requirements." This view clearly coincides with the approach of this thesis, albeit this work focuses on more macro-strategic incentives behind PLAN's modernisation.

The Type 075 may be used as a platform for far-seas power projection and oceanic presence and may do so as a core—flagship—of an amphibious task force. Type 075 offers a blend of capabilities, with a wide range of possible operational tasks such as forward presence, deterrence, escort, overseas defence, and humanitarian assistance/disaster relief (HA/DR) missions (Kennedy & Caldwell, 2022, pp. 4-5), maritime security operations (such as antipiracy operations), and non-combatant evacuation operations (NEOs), and so on (O'Rourke, 2022, p. 35).

In contrast to the smaller Type 071 LPD, which introduced the capability of vertical landing operations in the PLAN, the Type 075 has "scaled up the aviation component

of amphibious forces, allowing for increased air assault capabilities" (Kennedy & Caldwell, 2022, p. 6).

The utility of the new LHD class may also lie in a joint island landing campaign across the Taiwan Strait. However, the Type 075 is not "optimized for large-scale delivery of combat forces in high intensity contested and confined battlespace." Rather, it would be more suitable for operations conducted together with the PLANMC in the South China Sea, where a warship of this kind would easily outclass vessels of local rival claimants (Kennedy & Caldwell, 2022, p. 7) and could help solidify China's position in the region.

Given the new position of the Type 075 LHD in the PLAN Surface Force, more precise estimates and analyses of its capabilities and roles will yet be in the next years. The Type 075 class ships can be currently expected to serve at least until 2050. Furthermore, the three vessels of the class do not fully represent the PLAN that is, but rather the PLAN of the future decades. This assumption goes along with the longer timeframe necessary for fully acquiring all the skills that relate to operating a vessel of this kind.

Although Type 075's purpose may likely not lie in enhancing China's sea-denial capabilities in the immediate future, it will help create a long-term favourable environment for China in the post-sea-denial phases of its regional behaviour.

2.3.2 Landing Platform Docks

The Type 071 class is the only landing platform dock (LPD) in the PLAN Surface Force. The first unit of the class was commissioned in 2007 (navaltechnology.com, 2016), and the Type 071 LPD has become a well-known class of ships since (Joe, 2019). As seen in the table below, in 2013 the PLAN had 2 Type 071s in service. A decade later, this number has grown to eight.

Table 9. PLAN landing platform dock classes and number of units over time

Class	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Type 071	2	3	3	4	4	4	5	6	6	8	8
Total	2	3	3	4	4	4	5	6	6	8	8

(IISS, 2013, p. 290; 2014, p. 234; 2015, p. 240; 2016, p. 243; 2017, p. 282; 2018, p. 253; 2019, p. 259; 2020, p. 263; 2021, p. 253; 2022, p. 259; 2023, p. 241)

Type 071 is equipped with 4 AK630 close-in weapon systems (CIWS) for defence against incoming missiles, as well as one 76 mm gun located on the bow of the ship (IISS, 2023, p. 241). This light weaponry and armament of primarily self-defensive nature correspond with the main purpose of the ship. Type 071 is a landing platform dock (alternatively also amphibious transport dock) and, like the Type 075 LHD, is a type of amphibious assault ship designed for a wide variety of missions ranging from troop and vehicle transport, landing support, to non-combat support duties. In some cases, these ships may serve as "surrogate aircraft carriers in lower-threat areas" (Kirchberger, 2015, p. 73). Thus, these ships represent a significant addition to the PLAN's amphibious fleet (Blasko, 2017, pp. 7-8).

The Type 071 class has a length of 210 m, a beam of 28 m and a full load displacement of 25 000 tons. The ships feature a vehicle deck, well-deck, landing deck, and hangar (navaltechnology.com, 2016) The estimated capacity of the Type 071 ships is 4 LCAC plus supporting vehicles, 800 troops, 60 armoured vehicles and 4 helicopters (IISS, 2023, p. 240). These would primarily be the amphibious armoured vehicles of the ZBD05/ZTD05 family, used by the PLAN Marine Corps (PLANMC), able to deploy directly from the ship to the beach (Joe, 2019).

The new Type 071 landing platform dock class provides overall better capabilities and much greater capacity than older landing ships. As such, the ships could play a key role in joint operations with the PLANMC, and provide sufficient amphibious lift (Fanell, 2019, p. 10).

Like the even larger Type 075, the Type 071 class is a novel addition to the PLAN Surface Force. While initially estimated to be a class consisting of 6 ships (Kirchberger, 2015, p. 217), by 2022 this expectation was proven wrong as 8 vessels were already in service.

The Type 071 class landing platform docks can be expected to be utilized in far-seas operations, as well as during the Taiwan-related and South China Sea scenarios, indicating a high degree of versatility. It is likely that these vessels will serve as part of larger task forces, possibly in collaboration with the elements of PLANMC. The Type 071 represents primarily an important qualitative addition to the PLAN Surface Force and its amphibious fleet and can be expected to serve at least until the second half of the 2040s.

2.3.3 Landing Ships

The landing ships are a significant component of the PLAN amphibious fleet and include several different classes offering diverse capabilities. As of 2023, the Chinese landing ships, containing both tank landing ships and medium landing ships, remain a highly varied grouping of eight classes with no more than ten units each.

Table 10. PLAN landing ship classes and number of units over time

Class	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Type 072(IIG)	7	7	7	-	4	4	4	4	4	4	4
Type 072II/III	9	9	9	6	10	11	9	9	9	9	9
Type 072A	10	10	10	10	9	9	9	9	9	9	9
Type 072B	-	-	-	-	6	6	6	6	6	6	6
Type 073III	1	1	1	1	1	1	1	1	1	1	1
Type 073A	10	10	10	10	10	10	10	10	10	10	10
Type 074	10	10	10	10	10	10	10	10	10	10	10
Type 079	28	28	28	-	-	-	-	-	-	-	-
Total	75	75	75	47	52	53	49	49	49	49	49

(IISS, 2013, p. 290; 2014, p. 234; 2015, p. 240; 2016, p. 243; 2017, p. 282; 2018, p. 253; 2019, pp. 259-260; 2020, p. 263; 2021, p. 253; 2022, p. 259; 2023, p. 241)[12]

While in 2017, Blasko (2017, pp. 5-6) assessed that during the first *circa* 15 years of the 21st century, the Chinese fleet of landing ships has undergone significant modernisation, but these efforts did not ultimately result in a notable increase in sealift capacity.

During the analysed period of 2013–2023, these efforts (not counting the Type 071 and Type 075 classes) stalled almost completely. As can be seen in the table above (table 10), there has been the introduction of only one new landing ship class with only six units, and none of the other landing ship classes currently in service has seen an increase in the total number of units.[13]

Notably, the originally 30-unit strong Type 079 class of medium landing ship, that has been subjected to gradual decommissioning already by 2013 (Blasko, 2017, p. 6), have

[12] The Type 073III incorrectly counted as Type 073II in *The Military Balance*. Corrected in Table 10.
[13] It ought to be noted that the said new landing ship class, the Type 072B (Yuting-III), as stated and counted in *The Military Balance* (IISS, 2017, p. 282; and subsequent issues), is sometimes counted as a continuation of the Type 072A class ("Type 072A Yuting II class Tank Landing Ship – LST," n.d.).

been completely phased out of the PLAN active service. The remainder of the PLAN landing ship fleet remained highly stable, suggesting lower, if not outright low, priority for modernisation.

If the qualified estimates of Kennedy (2022) regarding the capacity of various landing ship classes are employed, this further amplifies the argument of low modernisation priority of said segment of the Chinese fleet. Kennedy (2022, p. 227) estimates the capacity of Type-072B LST to be 260 troops, 10 ZTD-05s, 1 helicopter, of the Type-072A LST to be 250 troops, 10 ZTD-05s, 1 helicopter, of the Type-072III LST to be 250 troops, 10 ZTD-05s, 1 helicopter, of the Type-072II LST to be 200 troops, 10–11 ZTD-05s, of the Type-073A LSM to be 180 troops, 8–10 ZTD-05s, of the Type-073III LSM to be 180 troops, 6–7 ZTD-05s, and of the Type-074 LSM to be 250 troops or 2–3 ZTD-05s.

Following these estimates, the landing ships of the PLAN as discussed in this subsection would have the capacity to transport 10 710 troops, 436 ZTD-05s, and 24 helicopters. As such, all landing ships of these classes would barely be able to transport mere two brigades of the PLAN Marine Corps (PLANMC), which, as Blasko & Lee (2019) state, have approximately 10 to 12 thousand troops.

Together with the Type 071 landing platform dock ships and the Type 075 landing helicopter dock ships, the total capacity of the PLAN Surface Fleet amphibious forces reach up to 19 510 troops, 1096 armoured vehicles and 140 helicopters. In terms of troops, this represents only a slight increase compared to the 2013 estimates by Blasko (2017, p. 6) of “fifteen to sixteen thousand” troops. Even then, the three to four thousand troop capacity growth is exclusively due to more Type 071 class ships being commissioned into service and the introduction of the Type 075 class landing helicopter dock ships.

While the total amount would provide sufficient capacity to, for example, transport armoured vehicles for all the six PLANMC brigades—approximately 112 vehicles per brigade, as stated by Kennedy (2022, p. 6), and have enough space for the equipment of several other battalions, the maximum troop capacity would prove to be the limiting factor.

Furthermore, as Blasko (2022, pp. 11-12) points out, the PLAN landing ships in total cannot provide sufficient amphibious lift capacity to transport the approximately

30,000 troops and more than 2,400 vehicles of the six amphibious combined arms brigades of the PLA Ground Force, which would play a critical role in a large-scale amphibious assault in the Taiwan scenario.

An invasion of Taiwan would therefore have to rely on completely different means (i.e., civilian transport ships) to transport necessary force to the island at the present time. An introduction of new landing ship classes and the construction of a high number of units would be an early indicator of the possibility of an amphibious invasion. Currently, the lack of modernisation efforts and build-up of the landing ships suggests a different set of priorities of the PLAN, such as suggested in the first chapter of the thesis.

2.3.4 Landing Crafts

The amphibious assault ships and the landing ships are complemented by smaller landing craft. Like the fleet of landing ships, the lack of introduction of new classes, and only a minimal growth of the Type 726 class air-cushioned landing craft (LCAC), as seen in Table 11, suggests minimal priority in terms of modernisation and growth of this part of the PLAN Surface Force, further indicating factors other than amphibious landings motivating the PLAN modernisation. As seen in Table 11, the PLAN fleet of landing crafts includes the Type 067(A) class medium landing craft, the Type 074A class utility landing craft, and the Type 726 class landing craft air-cushion (LCUC) and Zubr-class LCUC.

Table 11. PLAN landing craft classes and number of units over time

Class	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Type 067(A)	120	120	120	56	56	56	ε30	ε30	ε30	ε30	ε30
Type 068/9	20	20	20	-	-	-	-	-	-	-	-
Type 074A	10	10	10	10	11	11	11	11	11	11	11
Type 726 & Zubr	1	2	3	5	5	8	14	14	14	19	19
Type 724	10	10	10	12	12	12	12	11	-	-	-
Total	161	162	163	83	84	87	67	67	55	60	60

(IISS, 2013, p. 290; 2014, p. 234; 2015, p. 240; 2016, p. 243; 2017, p. 282; 2018, p. 253; 2019, pp. 259-260; 2020, p. 263; 2021, p. 253; 2022, p. 259; 2023, p. 241)[14]

[14] The 2013, 2014, 2015 & 2016 issues of *The Military Balance* classify the Type 074A as landing ship LSM (landing ship, medium). Further issues reclassify it as landing craft LCU (landing craft, utility).

During the analysed decade from 2013 to 2023, the Type 067(A) landing crafts have undergone a significant reduction in numbers, reflecting the necessity of decommissioning due to old age. The remaining approximately 30 Type 067 crafts could be the newer units built in the 1980s, after the construction programme was restarted (Saunders, 2009, p. 154), however, even these crafts can be expected to be decommissioned in the upcoming years.

The acquisition of Ukrainian Zubr-class air-cushioned landing crafts is notable, as these are larger LCs capable of carrying up to three tanks or five hundred troops at speed of more than 60 knots over water and land (Blasko, 2017, p. 7).

Considering that landing crafts are "smaller, open vessels designed to transport personnel and equipment from a larger vessel to land or across small stretches of water" (IISS, 2023, p. 496), it can be expected that in case of shifting priorities, the PLAN could rapidly commence the development of new classes and mass production of new vessels. Given China's exceptional manufacturing and shipbuilding capabilities, it should be expected that such production of landing crafts could easily dwarf the current shipbuilding rates of larger vessels, provided the circumstances required it.

2.4 Mine Warfare Vessels

Cole (2017, p. 25) described mine- and anti-mine warfare as one of PLAN's marginal capabilities. Although this statement, arguably, remains seemingly true, the fleet of mine warfare vessels is undergoing partial qualitative and quantitative transformation, indicating continuing role of the mine warfare vessels in future PLAN strategy.

In the past 10 years, PLAN's mine warfare fleet has seen a reduction in the number of classes of ships from 9 to 6. This was accompanied by growth in the total number of ships of some classes, namely the Type 081A, the Type 082II and the Type 529. During this 2013–2023 period, other three classes of mine warfare ships were completely decommissioned and placed out of active service: the Type 010/6610 minesweeper class, the Type 312 drone minesweeper class, and the Type 918 minelayer class (see Table 12).

Table 12. PLAN mine warfare vessel types, classes, and number of units over time.[15]

Type	Class	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
MCO	Type 081	6	8	4	4	4	4	4	4	4	4	4
	Type 081A			6	6	6	6	6	6	8	9+	9+
	Type 082II	1	2	2	2	4	5	6	7	7	7+	7+
MSO	Type 010/6610	16	16	16	14	ε5	ε5	-	-	-	-	-
MSC	Type 082	16	16	16	16	4	4	4	4	4	4	4
	Type 082I					10	12	12	12	12	12	12
MSD	Type 312	4	4	4	-	-	-	-	-	-	-	-
	Type 529	3?	6	6	6	6	6	18	21	21	21	21
ML	Type 918	1	1	1	1	1	-	-	-	-	-	-
Total		47	53	53	49	40	42	50	54	56	57	57

(IISS, 2013, p. 290; 2014, p. 234; 2015, p. 240; 2016, p. 243; 2017, p. 282; 2018, p. 253; 2019, p. 259; 2020, p. 263; 2021, p. 253; 2022, p. 259; 2023, p. 240)

The Type 6610 class was introduced to the PLAN as a result of the 1953 Sino-Soviet accord and their production began in the 1960s (Ericson, Goldstein, & Murray, 2009, p. 7), and as such were severely outdated already by the beginning of the 21st century and in the process of gradual phasing out. Lightly armed with a variety of guns, depth charges and mines, some of these nearly 600-ton vessels had their sweep gears removed and were used as patrol ships (Saunders, 2009, p. 156). Similarly, out of the originally 50 Type 312 drone minesweepers, developed in the 1970s based on German 'Troikas' (Ericson, Goldstein, & Murray, 2009, p. 7), only the last 4 were left by 2013. These were decommissioned by 2015.

The Type 918 minelayer class began its development in 1981, and in 1988 the first and only ship of this class was commissioned. The ship reportedly had a "multidirectional hoist for non-pier loading, a mechanized mine-transport system, and advanced fire-control radar, and [could] carry three hundred sea mines" (Ericson, Goldstein, & Murray, 2009, p. 9). With a full displacement of 3100 tons and a maximum speed of 18 knots (Saunders, 2009, p. 155), the ship was slow, relatively easy to detect, and thus apparently lacked an operational purpose. This, perhaps, was the reason why only one

[15] The abbreviations of the types of vessels stand for: MCO = mine countermeasure, ocean; MSO = mine sweeper, ocean; MSC = mine sweeper, coastal; MSD = mine sweeper, drone; ML = minelayer (IISS, 2023, p. 574).

ship of the class was constructed and was being used as a technological test bed (Ericson, Goldstein, & Murray, 2009, p. 9).

Despite the decommissioning of these classes, the PLAN currently remains the largest operator of minesweepers and naval mines in the Indo-Pacific (Wong, 2022). Since 2013, the PLAN has commissioned at least seven new Type 081A class ships, six Type 082II class ships, and 15 or more Type 529 class minesweeping drones, representing a significant addition.

Type 081A is a class of mine countermeasure vessels, similar to the older Type 6610 class, but five meters longer (Ericson, Goldstein, & Murray, 2009, p. 9). It can be seen as a direct replacement of the older class, with the Type 081A class possibly remaining in service until the 2040s. As of now, the production of further Type 081A ships has, likely, stopped.

The Type 082II class mine countermeasure vessel was first introduced in 2005. After a six-year hiatus, the production of further vessels has restarted (navyrecognition.com, 2016), and as of 2023, there are seven units of the class in active service. The Type 082II has a displacement of around 600 tons, a length of 55 meters and a beam of 9,3 meters. There is a hydraulic crane installed aft of the ships, that can be used to deploy a number of either towed or tethered bodies, including a remotely operated vehicle (ROV). The ROV is equipped with cameras for identifying mines, has four thrusters for agile manoeuvring and is said to have the capability to lay explosive charges to destroy mines on the seabed (Tate, 2016). Furthermore, the Type 082II vessels serve as motherships to the Type 529 class drone minesweepers (IISS, 2023, p. 240).

Type 529 is a class of optionally manned/remote-controlled unmanned surface vehicle (USV) minesweepers. Each vessel has a displacement of approximately 100 tons and can be remotely embarked for mine location, identification, and destruction. Reportedly, up to three Type 529 minesweeper drones can be operated from one Type 082II class mothership (Arthur, 2017).

The ongoing process of modernisation, the decommissioning of older outdated classes of ships, and the production of newer vessels, including minesweeping drone ships, indicates continuing attention of the PLAN to the domain of mine warfare. AS Wong (2022) points out, the role of Chinese offensive and defensive mine-laying warfare has

largely gone unnoticed both in academic and military circles and as such creates a tangible danger of oversight on both tactical and strategic levels.

The PLAN has noticed how even the most primitive mines can hinder much larger and superior force (e.g., mine warfare in the Persian Gulf during the First Gulf War) and has capitalised on this fact accordingly. In 2009, the PLAN has been said to have over 50 thousand naval mines of various capabilities and sophistication, going as far as developing new mine-laying systems, including aircraft-deployed parachute mine systems, rocket mine deployment and submarine mine deployment (Wong, 2022). PLAN strategists assessed that sea mines are "easy to lay and difficult to sweep; their concealment potential is strong; their destructive power is high; and the threat value is long-lasting," (Ericson, Goldstein, & Murray, 2009, p. 1). While aircraft carriers and large surface combatants typically catch the headlines, the mine warfare capabilities of the PLAN and the mine warfare vessels should not be overlooked under any circumstances.

Mine warfare vessels must be analysed in the context of their practical capabilities and with the current regional power setting in mind. For example, unlike submarines, which "are large and difficult to hide, … mine warfare capabilities are easily hidden and thus constitute a true assassin's mace" and would allow the PLAN not only to "fully … blockad[e] Taiwan and other crucial sea lines of communication in the western Pacific area" but would also "constitute a deadly serious challenge to U.S. naval power in East Asia" (Ericson, Goldstein, & Murray, 2009, p. 2). Mine warfare vessels, as inconspicuous as they may seem, should be understood as part of wider anti-access/area denial (A2/AD) strategies, especially in littoral waters, and in the context of China's sea-denial approach to securing its regional position.

2.5 Conclusion

The People's Liberation Army Navy Surface Force has experienced significant qualitative as well as quantitative—albeit not uniform across the branch as a whole—transformation. The commissioning of a second aircraft carrier, with the first entering service in 2012—just before the beginning of the analysed period—and a third one nearing completion marks the continuation of unprecedented expansion of PLAN, but often overshadows other developments. Introduction of first cruiser class with eight

units already in service, doubling the number of destroyers and overall modernisation of the destroyer and frigate fleets, as well as commissioning of over 50 corvettes, a new type of ship in the inventory of the PLAN, are only some of the most significant aspects of the modernisation process.

While the missile boat fleet remained mostly unchanged, pointing towards both its indispensability within current PLAN strategy as well as leadership's satisfaction with the missile boat fleet architecture at the present time, the patrol crafts and boats in PLAN's service are being gradually phased out. Similarly, the number of landing ships and landing crafts has decreased, with the attention shifted towards construction of significantly larger landing helicopter docks and landing platform docks, both novelties in terms of Chinese naval forces. Often overlooked, the mine warfare fleet is undergoing a moderate quantitative increase as well as qualitative modernisation, highlighting the persisting importance of mine warfare in the eyes of the PLAN.

The focus on large surface vessels, improvement of anti-ship and anti-air capabilities, move away from the smallest coastal patrol crafts and boats towards more versatile littoral combatants, and a lack of construction of smaller amphibious vessels, suited for a large-scale invasion, points towards new roles for the PLAN Surface Fleet. Arguably, it will try to simultaneously act as a counterweight to its regional and extra-regional peer competitors, while assuming increasingly dominant position within its closest region vis-à-vis smaller, less capable navies of neighbouring countries.

3. Submarine Force

This chapter is focused on the People's Liberation Army Navy Submarine Force, one of the key branches of the PLA Navy. The chapter analyses the development of the Submarine Force during the past decade with special focus on the process of modernisation of the submarine fleet.

The chapter is divided into two main sections: 1) ballistic missile submarines, and 2) attack submarines, reflecting their distinct operational purpose. Each of these sections is further divided into two subsections, in order to differentiate between the nuclear-powered and conventional-powered segments of the Chinese submarine fleet. Third section offers a comprehensive conclusion.

It ought to be noted, that the PLAN Submarine force, and in particular the nuclear-powered submarines, are among the most classified Chinese military programs (Sarkar, 2019, p. 7). This results into a 'shroud of mystery' surrounding the topic and many contradictions, speculations, and propaganda, that often carry over even into official reports (Sterk, 2023).

Therefore, following the more easily verifiable information, such as the total count of analysed units, or assessing chiefly the main characteristics and aspects of the submarines, such as weaponry, can be considered especially sound approach to analysis, compared to for example surface vessels.

3.1 Ballistic Missile Submarines

3.1.1 Nuclear-powered Ballistic Missile Submarines

The Chinese nuclear-powered ballistic missile submarine (SSBN) fleet currently consists of a single class, the Type 094, with 6 units. Since 2013, the number of units of this class in active service has doubled. However, the total number of SSBNs has increased only incrementally, as the numerical growth of the Type 094 class was accompanied by the decommissioning of the outdated Type 092 class (see Table 13). Notably, during the analysed period, a construction of newer, more capable class of SSBNs, so far called Type 096, has not yet begun.

Table 13. *PLAN ballistic missile submarine classes and number of units over time*

Class	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Type 092	1	1	1	-	-	-	-	-	-	-	-
Type 094	3	3	4	4	4	5	5	5	6	6	6
Type 096	*Construction to begin in early 2020s* (DOD, 2022)										
Total	**4**	**4**	**5**	**4**	**4**	**5**	**5**	**5**	**6**	**6**	**6**

(IISS, 2013, p. 289; 2014, p. 233; 2015, p. 239; 2016, p. 242; 2017, p. 281; 2018, p. 252; 2019, pp. 258; 2020, p. 261; 2021, p. 251; 2022, p. 257; 2023, p. 239; Ray, 2020, p. 3)

The Type 092 class was, arguably, an unsuccessful project. First designed in 1967, the construction of the class began in 1971. The unit was however commissioned only in 1983 (Ray, 2020, p. 3). The class was a product of a 'trail and error' type of approach, being subjected to many system upgrades and spending most of its time at a base, rather than at the sea. The class was rumoured to consist of two units, with the second submarine allegedly having been lost in an accident in the 1980s (Kirchberger, 2015, p. 220). The Type 092 suffered from a number of issues, including a high noise levels and radiation leakage (Ray, 2020, p. 3). The submarine was armed with 12 JL-1 strategic submarine-launched ballistic missiles (IISS, 2013, p. 289), but these single-warhead first-generation SLBMs were limited by their short range (Ray, 2020, p. 3). Reportedly, the only Type 092 class submarine has never completed a single deterrent patrol (Harris, 2016, 348). After some three decades of 'active' service, the only unit of the class was decommissioned by 2016 (see Table 13 above).

China's first credible sea-based nuclear deterrence came only with the introduction of the Type 092's successor, the Type 094 class (Sarkar, 2019, p. 8). The construction of first units began in the early 2000s and in July 2004 the first submarine was launched (Harris, 2016, p. 349), entering service in 2007 (Ray, 2020, p. 3). At first, the Type 094 has also experienced reactor problems, similar to other Chinese-designed nuclear submarines (Kirchberger, 2015, p. 220), but overall, the new class can be described as a significant improvement in terms of Chinese submarine design and construction.

The Type 094 class has length of approximately 135 meters and is estimated to have submerged displacement of around 14000 tons. As such, it is a bit smaller to the French *Triomphant*-class SSBN and lags considerably in terms of size behind the American *Ohio*-class and Russian *Borei*-class SSBNs of 24000 and 18750 tons, respectively

(Sarkar, 2019, pp. 8-9). In terms of detectable noise levels, the Type 094 is louder than Soviet submarines designed in the 1970s, and thus presents an easy target for Japanese and American ASW forces (Harris, 2016, p. 349).

Type 094 submarines have been armed with up to 12 JL-2 strategic submarine-launched ballistic missiles (IISS, 2022, p. 256), with the latest assessments stating submarines' rearmament with the latest JL-3 SLBMs (Capaccio, 2022; IISS, 2023, p. 239). While the JL-2 ballistic missile system has a range of 7,000 to 8,000 km (Kirchberger, 2015, p. 220), and would thus compel the Type 094 class submarines to operate in areas north and east of Hawaii, if the PLA sought to hit targets on the East coast of the US (DOD, 2022, p. 96), the newer ballistic missiles significantly expand the possible area of operations. The JL-3 has estimated range of more than 10,000 km and would allow to strike the aforementioned targets from littoral waters close to China (O'Rourke, 2022, p. 19). The new JL-3 ballistic missiles can be expected to capitalize upon and or significantly improve the capabilities of the second-generation JL-2, which Sarkar (2019, p. 9) described as follows:

> [JL-2] has a potential payload of 1-2.8 tons and has a three-stage solid propellant engine with a launch weight of 42 tons. It can carry a one megaton warhead or multiple independent re-entry vehicles of 20-150 kilotons each. The missile may be outfitted with penetration aids and decoys to overwhelm ballistic missile defences (BMD) systems. The missile uses an inertial guidance system and a GPS system. It may also use the Bei Dou navigational satellite system. These missiles will likely have an accuracy of 150-300m circular error probability.

With six Type 094 nuclear-powered ballistic missile submarines in service as of 2023, the PLAN has firmly positioned itself as a key part of China's nuclear deterrence capabilities. The newer, more capable missiles with greater range will also compensate for other deficiencies of the Type 094 class design, such as the high noise levels.

The 'loudness' of the submarines, and thus their easy detectability, will likely force China and the PLAN to implement a "bastion deployment strategy" and confine the submarines to the seas adjacent to the mainland, i.e., the Bohai, Yellow or South China sea, where they could be 'shielded' by other Chinese naval and air assets (Harris, 2016, p. 349).

While the Type 094 class submarines form a part of China's nuclear deterrence system, their usefulness, i.e., the ability to actually perform a missile launch and strike a desired target, is conditioned by their survival in the first place. Limiting their region of operation to a compact area such as the South China sea clearly shows the dilemma faced by the PLAN. On one hand, as mentioned above, this would facilitate protection by other PLA systems, including ASW surface combatants, carrier-based or land-based aircraft, etc., but would simultaneously grant the enemy the advantage of knowing, so to speak, where to look.

As Ray (2020, p. 4) further points out, the South China sea would be the most suitable option out of the three mentioned, mainly because of its exceptional depth, size (the largest of the three seas), and due to Japanese and American seabed arrays and monitoring devices in the choke points between the East China sea and the Pacific Ocean.

While this highlights the importance of the South China sea from a rare, often completely undiscussed point of view, it should be noted that the Type 094 is not complexly defenceless against hostile submarines. *The Military Balance* (IISS, 2023, p. 239) further lists armament of Yu-6 heavyweight torpedoes in 6 single torpedo tubes. This would allow the Type 094 to act against both surface and subsurface targets.

While the Type 094 represents a step ahead in Chinese sea-based nuclear deterrence capabilities, the class is often seen as a "harbinger for future strategic … capabilities" (Harris, 2016, p. 348) associated with the upcoming Type 96. The Type 96 class is going to be China's next generation SSBN, and its construction is likely to commence in the early 2020s (DOD, 2022, p. 96). Based on these expectations, the Type 096 submarines are unlikely to be delivered before 2030 (Ray, 2020, p. 10).

The US Department of Defence (DOD, 2022, p. 96) states that the next generation Type 96 is probably intended to field "MIRVed SLBMs," i.e., submarine-launched ballistic missiles with multiple independently targetable re-entry vehicle (MIRV) capabilities and will likely be in active service concurrently with the Type 094, based on 30-plus-year service life of the Chinese first-generation nuclear submarines. However, as nuclear submarines are amongst the most classified Chinese military programs (Sarkar, 2019, p. 7), a lot of information regarding the Type 096 is of speculative character.

Ray (2020, p. 4) asserts that the Type 096 could have displacement of about 18,000 tons, and thus be comparatively closer to its American and Russian counterparts, higher number of ballistic missiles, possibly up to 24, with greater range. Harris (2016, p. 349) also points that increasing the number of SLBM compartments would be necessary in order to match the capacity of American SSBNs, which typically house between 16 and 24 missiles.

Overall, during the analysed period, the PLAN has continued to improve its capabilities in the domain of nuclear ballistic missile submarines, effectively doubling the size of this component of the Submarine Force, while decommissioning the older class, thus adding to the qualitative transformation of the Navy. This was accompanied by the introduction of longer-range ballistic missiles, further enhancing the nuclear deterrent capabilities of the PLAN Submarine Force. Greater changes are, however, to be expected later with the introduction of the Type 096 class.

3.2.3 Conventional Ballistic Missile Submarines

Besides the nuclear-powered Type 094 class, and formerly the Type 092 class, the PLAN Surface Force continues to keep one conventionally powered ballistic missile submarine class, Type 032, in active service. While the development of the Type 032 class began in 2005, and the construction started in 2008, the unit was completed only in 2010 and entered service in October 2012 (Keck, 2014b), just before the period analysed in the thesis, and thus represent an interesting addition that should not be overlooked.

The Type 092 class is unique as it combines the conventional, i.e., diesel-electric propulsion (Keck, 2014b), with the capability to launch nuclear missiles, namely the JL-2 ballistic missiles, also used in the Type 094 class (Kirchberger, 2015, p. 229). The Type 032 has a surface displacement of 3,797 tons and a submerged displacement of 6,628 tons. Its length is reportedly 92.9 meters, and its height is 17.2 meters. As such, it is considered to be the world's largest conventional submarine (Keck, 2014b). The Type 032 class is likely a "trial platform," an experimental submarine, with single unit constructed for the purpose of testing new missiles (Kirchberger, 2015, p. 229), including the JL-2A ballistic missiles, JL-18B anti-ship cruise missiles and CJ-20A cruise missiles. Unconventionally, the submarine is further armed with a single 533 mm torpedo tube paired with an extra-large 650 mm one. The submarine has also been

allegedly used to test submarine-launched surface-to-air missiles, new underwater escape pods and possibly also the deployment of undersea drone(Roblin, 2021).

Although it has the capacity to carry and launch nuclear ballistic missiles, the submarine cannot operate for a prolonged periods of time due to its propulsion (Kirchberger, 2015, p. 229), and therefore most likely does not represent a novel development branch. While the unit can be expected to reliably serve as a test platform until the 2040s, it does not represent a key part of the PLAN Submarine Force.

3.2 Attack Submarines

Besides the ballistic missile submarines, the PLAN operates a numerous fleet of attack submarines, both nuclear-powered and conventionally powered.[16] In terms of conventional attack submarines, the People's Liberation Army Navy continues to be amongst the largest operators, with 46 units in active service (IISS, 2023, p. 239).[17]

This segment, i.e., the conventionally powered attack submarines, has also seen the most substantial change of the PLAN Submarine Force in the past decade, including the reduction of number of classes in active service by a third, slight decrease in the total number of units, and simultaneous quantitative growth of units of the most modern classes, resulting in partial rejuvenation of the conventional stack submarine fleet.

3.2.1. Nuclear-powered Attack Submarines

Currently, the PLAN Submarine Force operates 6 nuclear-powered attack submarines of two classes, 2 Type 093 submarines and 4 Type 093A submarines. While this segment of the Chinese submarine fleet has not seen a quantitative growth (see Table 14), it has been subjected to measured qualitative modernisation focused on sectional improvements.

During the 2013–2023 period, the PLAN oversaw the decommissioning of the Type 091 class of nuclear attack submarines. Type 091 was the oldest Chinese class of

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[16] Both nuclear-powered and conventional attack submarines are submarines armed primarily with torpedoes against submarines and surface vessels, possibly also with underwater-to-surface missiles (USM) and cruise missiles for land attack.

[17] The second is Japan with 24 conventional attack submarines (IISS, 2023, p. 259), followed by Russia with 21 (IISS, 2023, p. 186)

nuclear submarines. The construction of the first unit of the class began in 1967 and entered service in 1974. In total 5 Type 091 submarines were commissioned, with the last one becoming part of the PLAN Submarine Force in 1991 (Ray, 2020). The Type 091 proved to be a problematic design, as it initially had problems with excessive levels of radiation, endangering the crew, and suffered from an inability to fire missiles when submerged, a critical issue for a nuclear submarine with strategic operational purpose (Kirchberger, 2015, pp. 144, 218). By 2013, three Type 091 submarines remained in active service (IISS, 2013, p. 289), armed with YJ-82 surface-to-surface inertially guided cruise missiles with range of up to 40 km, and 6 bow torpedo tubes with Yu-3 torpedoes (Saunders, 2009, p. 130).

Table 14. *PLAN nuclear-powered attack submarine classes and number of units over time*

Class	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Type 091	3	3	3	3	3	3	(3r)[18]	(3r)	(3r)	(3r)	(3r)
Type 093	2	2	2	2	2	2	2	2	2	2	2
Type 093A	-	-	-	-	-	4	4	4	4	4	4
Total	**5**	**5**	**5**	**5**	**5**	**9**	**6**	**6**	**6**	**6**	**6**

(IISS, 2013, p. 289; 2014, p. 233; 2015, p. 239; 2016, p. 242; 2017, p. 281; 2018, p. 252; 2019, pp. 258; 2020, p. 261; 2021, p. 251; 2022, p. 257; 2023, p. 239)

As seen in the table above, last of the Type 091 submarines were decommissioned by 2019 and moved to reserve. Furthermore, during its service, the Type 091 class has been accompanied by Type 093, a newer class of 2 nuclear-powered attack submarines, that continue to be in active service after Type 091's retirement.

The Type 093 class consists of two units, laid down in 1994 and 2000, launched in December 2003, and commissioned in 2006 and 2007 respectively. The dived displacement of Type 093 is approximately 6,000 tons (Saunders, 2009, p. 129). The Type 093 submarines have, similarly to other Chinese nuclear submarines, experienced issues with radiation levels; those have been alleviated only after Russian technical assistance (Kirchberger, 2015, p. 144). Since at least 2018, further four nuclear-

[18] The (r) marks units in reserve, no longer in active service. As such, they are not counted in the total amount of submarines in the given year.

powered attack submarines have been commissioned into service, all belonging to the newer, improved Type 093A class.

The Type 093A class has displacement of approximately 7,000 tons, with enough space for noise reducing features, reflecting the utmost importance of acoustic stealth. With newer classes, it can be assumed that the Chinese designs are becoming increasingly stealthy (Sutton, 2020). As of 2023, both Type 093 and Type 093A class submarines are equipped with 6 single 533 mm torpedo tubes that may be armed with YJ-82 or YJ-18 anti-ship missiles or Yu-3 or Yu-6 heavy-weight torpedoes (IISS, 2023, p. 240), indicating a qualitative improvement over the armament of the older design.

The Type 093A is 107 meters long and can reportedly accommodate 100 crew members. The submarines of this class are equipped with advanced sensors, namely improved radar and sonar systems, and can reach a maximum speed of 30 knots (navaltechnology.com, 2023). While the submarines are estimated to carry only 22 torpedo-sized weapons, i.e., considerably less than its American, British, or French counterparts, the Type 093A class currently represents the most powerful nuclear-powered attack submarine of the PLAN, and a cause for concern for potential adversaries (Sutton, 2020).

The US Department of Defence expects the construction of new class of guided-missile nuclear-powered attack submarines, possibly Type 093B, to begin by the mid-2020s. It is expected that this improved class will further enhance PLAN's anti-surface warfare capabilities and will possibly create an option for a clandestine land attack if equipped with land-attack cruise missiles (DOD, 2022, 53). However, as of 2023, the nuclear attack submarine segment of the PLAN Submarine Force underwent only gradual modernisation. This was characterised by the decommissioning of the Type 091 class and introduction of the new improved Type 093A class. In terms of quantity, the Chinese nuclear attack submarines did not register any significant growth, as the decommissioning of the older Type 091 class coincided with the Type 093A submarines entry into an active service.

3.2.2 Conventional Attack Submarines

The Chinese fleet of conventionally powered attack submarines has been subjected to partial, but substantial transformation. As seen in the table below, the number of classes of has decreased from 9 to 6, with the Project 877, Type 035, and Type 035G classes

having been decommissioned. While this still means a highly varied force, a reduction by a third is notable.

Concurrently, the total number of conventional attack submarines has gone down, despite a temporary increase during the years 2014 and 2015. As of 2023, the PLAN Submarine Force has at least 46 conventional attack submarines in service. Compared to the 55 in 2013, this represents nearly a 20% decrease in total numbers.

However, the decrease in numbers has been compensated by an increase in quality. The PLAN has been commissioning units of the modernised Type 039B class, overseeing the growth from mere 3 units in 2013, to more than 16 in 2023. Together with the Type 039/G and Type 039A class, the Type 039 series has become mainstay of the PLAN attack submarine fleet, with more than 30 units in active service.

Table 15. *PLAN conventional attack submarine classes and number of units over time*

Class	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Project 877	2	2	2	2	2	2	2	2	2	2	-
Project 636	2	2	2	2	2	2	2	2	2	2	2
Project 636N/M	8	8	8	8	8	8	8	8	8	8	8
Type 035	4	4	4	-	-	-	-	-	-	-	-
Type 035G	12	12	12	8	7	7	4	2	-	-	-
Type 035B	4	4	4	4	4	4	4	4	4	4	4
Type 039/G	16	16	16	12	12	12	12	12	12	12	12
Type 039A	4	4	4	4	4	4	4	4	4	4	4
Type 039B	3	8	8	11	8	9	12	14	14	14	16+
Total	**55**	**60**	**60**	**51**	**47**	**48**	**48**	**48**	**46**	**46**	**46**

(IISS, 2013, p. 289; 2014, p. 233; 2015, p. 239; 2016, p. 242; 2017, p. 281; 2018, p. 252; 2019, pp. 258; 2020, p. 261; 2021, p. 251; 2022, p. 257; 2023, p. 239)

In 2013, the Type 035 class submarines were the oldest ones still in service. These submarines, with the length of 76 meters, the displacement of approximately 2,100 tons and a maximum speed of 18 knots, were modelled after Soviet *Romeo*-class submarines. In early 2000s, some of these submarines were involved in tragic accidents. In one case, the entire crew of 70 suffocated after a technical malfunction (Kirchberger, 2015, pp. 223-224). Armed with a combination of Yu-4 and Yu-1 torpedoes in 8 single 533 mm torpedo tubes (Saunders, 2009, p. 133), submarines of this class were being described as inadequate, that could even serve as “bait or decoy

submarines" (O'Rourke, 2009, p. 5). By 2016, the last Type 035 units were finally decommissioned.

Simultaneously, the modified Type 035G class was being rapidly reduced in numbers. Armed with Yu-3 or Yu-4 torpedoes in 8 single 533 mm torpedo tubes (IISS, 2020, p. 261), only two last submarines were left in 2020, from the original 12 that were still in active service in 2013 (see Table 15), and eventually decommissioned altogether by 2021.

Third and latest class that was put out of service was the Project 877. The two submarines of this class were the oldest out of 12 purchased Soviet-designed submarines, the newer being improved Project 636 (Kirchberger, 2015, p. 227), of which all ten are still in active service. The Project 877 submarines were equipped with 6 single 533mm torpedo tubes, armed with TEST-71ME/53-65KE heavyweight torpedoes (IISS, 2023, p. 257), and lacked the ability to launch anti-ship cruise missiles (ASCM), that eight other Russian-build submarines have (DOD, 2022, p. 52). This comparative weakness arguably played a role in their selection for the decommissioning.

The 10 remaining submarines of the Project 636 class and the Project 636N/M, while not considered up to date with other modern competing designs, are relatively well armed, capable, and quiet (Kirchberger, 2015, pp. 227-228), and as such outweigh the deficiencies of the Chinese-designed submarines, especially in terms of acoustic stealth. While their primary torpedo armament corresponds with the armament of the now decommissioned Project 877 class, the improved Project 636N/M class is further equipped with 3M54E Klub-S short range anti-ship missiles (IISS, 2023, p. 239). This could eventually result in the two Project 636 class units being decommissioned first, compared to the eight missile-equipped N/M variation units.

Besides the Project 636 and Project 636N/M, the conventional attack submarine classes in active service as of 2023 are the Type 035B class, and three classes of the Type 039 series: the Type 039/G class, the Type 039A class and the newest, fast-growing Type 039B class.

The keel of the first Type 039 class submarine was laid down in 1991. It was the first indigenously built Chinese submarine, intended to replace the older classes. The first unit was, however, commissioned only in 1999 due to design and performance issues.

Extensive redesign subsequently resulted in a modified version, the Type 039/G (naval-technology.com, 2010).[19] Type 039 has a length of about 75 meters, a beam of 7,5 meters and a draught of 5,3 meters. When surfaced, it displaces 1,700 tons and has full displacement of 2,250 tons when dived. Maximum speed on surface is 15 knots, while 22 knots when dived (Saunders, 2009, p. 131). The Type 039 class has a low-drag hydrodynamically profiled hull and sail and was the first Chinese conventional submarine to use a teardrop, i.e., hydrodynamically sleek, hull design. Its hull is covered with rubber tiles to absorb the sound waves and negate the effect of sonar, further enhancing the Type 039's acoustic stealth capabilities (naval-technology.com, 2010). As Sarkar (2019, p. 12) further points out, with the advent of the Type 039 series, the Chinese submarines have—to a large extent—become as stealthy as their Western counterparts.

The Type 039/G class is fitted with six 533mm torpedo tubes, located at the bow, for both torpedoes and anti-ship missiles. Namely, they can be armed with Yu-3 acoustic-homing anti-submarine torpedoes and Yu-4 passive acoustic-homing anti-ship torpedoes or possibly Yu-6 anti-ship/anti-submarine torpedoes. The submarine can also carry 24 to 36 tube-launched naval mines in place of torpedoes. Type 039 is also armed with YJ-82 or YJ-18 anti-ship cruise missiles launched from the torpedo tubes (naval-technology.com, 2010; IISS, 2023, p. 239).

The newer classes of Type 039A and Type 039B follow up on the design of the Type 039/G, but further accentuate its strengths. While the armament of these classes is identical to that of Type 039/G submarines (IISS, 2023, p. 239), the Type 039A and Type 039B are comparatively much more effective anti-ship cruise missile platforms, due to their enhanced sonar suites and greater tactical flexibility provided by the air-independent propulsion (AIP) systems. This capability is only limited by small salvo size and low load out of missiles in torpedo room (Carlson, 2015).

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[19] It should be pointed out, that the figures presented in *The Military Balance*, i.e., 16 units of the Type 039/G class in 2013, 2014 and 2015, are likely a miscount. As Kirchberger (2015, p. 222) states, 13 units of the Type 039 class have been built. It is similarly unlikely that one of these units has already been decommissioned, as even the first one would be less than 20 years old at the time of the assumed decommissioning. Therefore, the Type 039 class unit count as presented in the Table 15 should be approached with this in mind.

The Type 039A and Type 039B classes are also comparatively larger, with surfaced displacement of 2,700 tons and submerged displacement of 3,600 tons. The hull is similarly clad with anachronic tiles, minimizing the returning sonar echoes. The Type 039B class features a modified hull and a redesigned coning tower (Gady, 2017). Despite some categorisations of Type 039A & B as small, these two classes are those of large submarines, especially in terms of conventionally powered ones. The design aspects, such as the AIP, as well as its sonar suite, point towards deep waters in the near seas as the possible intended areas for future operation (Carlson, 2015).

Overall, the Type 039A class and the Type 039B class respectively, seem to become the cornerstone of the PLAN fleet of conventional attack submarines. As most of these vessels have been commissioned in the past decade, they will likely serve up until the late 2040s.

3.3 Conclusion

During the analysed period, the PLAN Submarine Force has been undergoing a qualitative modernisation, which is likely to continue. The decommissioning of older or outright outdated classes has been accompanied by introduction of units of modern classes into the active service, typically of a single class in each segment, i.e., attack or ballistic missile submarines. In case of conventional attack submarines, the decommissioning rate has surpassed the construction of new units, which led to an overall decrease of the number of active submarines of this segment by nearly one fifth. The number of nuclear ballistic missile submarines and nuclear attack submarine has, however, remained stable and grown in order of units.

The PLAN Submarine Force has, arguably, focused on rectifying the known issues and deficiencies, which have troubled the Chinese submarine fleet in the past decades, notably the lack of acoustic stealth of its submarines. The ongoing developments suggest accommodation of the development of the Submarine Force to strategies relying on the utilisation of the South China sea in the case of an open conflict. Namely the nuclear ballistic missile submarines, forming a part of the nuclear deterrent of the People's Republic of China, and the newest classes of the conventional attack submarines, could be employed in a manner that would exploit the oceanic depth of the South China sea as well as the support of other assets in the area.

The development of the PLAN Submarine Force does not correspond with the theoretical expectations assuming active preparation for a Taiwan-related conflict scenarios or even an imminent invasion of Taiwan. This can be expounded by highlighting not only the lack of quantitative build-up of submarines (to the contrary, a decrease in total numbers), but by the lack of dedicated coastal submarines suitable for operations in littoral seas and in the shallow waters of the Taiwan strait.

4. Marine Corps

This chapter analyses the modernisation and the development of the People's Liberation Army Navy Marine Corps, a land arm of the Chinese naval forces, and a unique part of the Chinese military. After several decades of status quo, the PLAN Marine Corps has been put on the path of significant expansion and reform, affecting not only its size, but organisational structure, fielded equipment, weaponry, as well as the Corps' potential future roles.

The chapter is divided into two main sections, The first section deals with the changes in the organisational structure of the PLANMC, the expansion of the Marine Corps and reforms of the corps-, brigade- and battalion-level units. The second section analyses the modernisation of the equipment of the Marine Corps, the vehicles and weaponry used by the PLANMC. Both sections are appropriately divided into subsections to allow for greater clarity.

4.1 New Organisational Structure

While the PLA Ground Forces continue to reduce in numbers, the PLAN Marine Corps has grown to a total of eight brigades with approximately 40,000 personnel (Iida, 2022, p. 2). According to some sources, PLANMC is set to grow to up to 100,000 marines (Hanson, 2020). Naturally, as the PLANMC adapts to the unprecedented growth, so does develop its organisational structure.

However, the PLANMC is not merely expanding in size. The whole PLAN Marine Corps has been subjected to a significant transformation at both brigade and battalion level. In terms of organisational structure, the PLANMC is currently the most rapidly developing service arm in the People's Liberation Army as a whole.

As Kennedy (2021, p. 3) points out, analysis of post-reform PLANMC construction is essential to assessing its capabilities. While the process is still ongoing, in some cases an almost full picture can be put together by examining the various changes and development in different units.

4.1.1 Corps- and Brigade-level Reforms

For the nearly 20 years since 1980, the PLA Navy had only a single marine unit—the 1st Marine Brigade—at its disposal,[20] subordinated to the South Sea Fleet. In 1997, a second unit was formed from the downsized and reformed former 164th Division of the PLA Ground Force, called the 164th Marine Brigade. Both units were stationed near Zhanjiang in Guangdong province (Blasko, 2010). While the two brigades gradually modernized their equipment, they were not subjected to any major changes in terms of their organisational structure or chain of command (Iida, 2019, p. 2). The two brigades numbered approximately 12,000 personnel and were largely responsible for operations in the South China sea and contributions of manpower to Chinese anti-piracy escort task forces (Kennedy, 2021, p. 1).

Major organisational changes began in late 2015 and early 2016, including a "reorganization of the bureaucratic structure under the CMC, creation of a system of five joint theatre commands (TCs), and establishment of two new quasi-services that will support joint operations: the Strategic Support Force (SSF) and Joint Logistics Support Force (JLSF)," and were accompanied by the continuation of further reform efforts: personnel reductions, overhaul of the PLA's education system, streamlining of the existing group armies and ongoing brigadisation (Wuthnow & Saunders, 2019, pp. 2, 5-10). The expansion of the PLAN Marine Corps began only a little later, in April 2017, as an important part of the reform of the PLA's operational forces (Blasko & Lee, 2019a).

The two existing brigades, the 1st Marine Brigade and the formerly 164th Marine Brigade, now renumerated as the 2nd Marine Brigade, remained in their original locations where they continue to be the most combat ready units of the PLANMC (Kennedy, 2021, pp. 3, 6), and constitute the core of the expanding PLAN Marine Corps. Besides these two original units, four new manoeuvre brigades were formed.

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[20] Some sources tend to incorrectly state that the People's Liberation Army Navy Marine Corps was founded already during the 1950s. However, in 1954 only a marine division of the PLA, not the PLA Marine Corps of its own, was founded in order to fight in the battle for Yijiangshan Island during the First Taiwan Strait Crisis. After the Korean War, PLA had formed a total of eight marine divisions composed of the returning soldiers, but these too were eventually disbanded. The establishment of a dedicated marine force subordinated to the PLA Navy was decided by the CMC only after an unsatisfactory performance by the PLA Ground Force units during the Xisha (Paracel) Island campaign in 1974. This resulted in the formation of the 1st Marine Brigade (Blasko, 2010).

The 3rd Marine Brigade was formed by conversion from the 13th Coastal Defense Division, Fujian Provincial Military Region, the 4th Marine Brigade was formed similarly from 2nd Coastal Defense Division, Shanghai Garrison, and the 5th Marine Brigades was likewise converted but from the Coastal Defence Corps of the Qingdao Garrison. Unlike these three brigades formed from various coastal defence units, the 6th Marine Brigade was formed by conversion from the 77th motorized infantry brigade of the 26th Group Army (Iida, 2020, p. 3; Kennedy, 2021, pp. 6, 9), which could have facilitated easier transformation, with more and newer equipment as well as better trained personnel at hand. Besides these, a new Marine Shipborne Aviation Brigade has been formed out of elements from all three PLAN independent air regiments (Blasko & Lee, 2019a). Sometimes enumerated as the 7th (Aviation) Brigade, it is a significant addition to the PLANMC, which until then had to complately rely on PLAN helicopters to provide aerial mobility (Kennedy, 2021, p. 7).

Furthermore, a new Special Operations Brigade has been formed out of the until then existing Jiaolong commando unit, a special operations forces (SOF) regiment subordinated to the PLA Navy command (Blasko & Lee, 2019a). The brigade is approximately 3,000 strong, with a third of the personnel having been transferred from other units. The number of battalion formations subordinated to the Special Operations Brigade is unknown (Kennedy, 2021, p. 6). In terms of size, the new brigade is around 50 % larger when compared to the old SOF regiment, assumed to be 2,000 strong (Blasko & Lee, 2019a). All eight brigades of the newly reformed PLAN Marine Corps can be seen in Table 16, together with the location of their home bases, as well as the Theatre Commands (TC) to which the brigades are subordinated.

Table 16. *PLAN Marine Corps brigades.*

Theatre	Brigade	Location
Southern	1st Marine Brigade	Zhanjiang, Guangdong
	2nd Marine Brigade	Zhanjiang, Guangdong
	Special Operations Brigade	Sanya, Hainan
Eastern	3rd Marine Brigade	Jinjiang, Fujian
	4th Marine Brigade	Jieyang, Guangdong
Northern	5th Marine Brigade	Qingdao, Shandong
	6th Marine Brigade	Qingdao; Yantai Shandong
	Naval Shipborne Aviation Brigade	Zhucheng, Shandong

(Kennedy, 2021, p. 4)

The six manoeuvre brigades are now evenly distributed between the three TCs (see Table 16), which is a notable change, as the two original brigades were both stationed in the Southern TC.

The expansion was accompanied by the establishment of the PLAN Marine Corps' own headquarters at the level of an army corps (Blacko & Lee, 2019b), which resulted in the PLANMC being the only branch of the PLA Navy with its own headquarters (Iida, 2022, p. 2). The new headquarters appears to be located in Chaozhou in Guangdong province, not far from Jieyang, a home base of one of the newly establish marine brigades. This is notable for two main reasons: first, the outside-of-Beijing location mirrors that of the PLA Air Force Airborne Corps headquarters, which is situated in Hubei province and commands over brigades dispersed in multiple theatres, and consequentially second, the location of HQ far from many of its subordinate units implies that the PLANMC is likely not intended to be deployed organically as a whole, like the group armies of the PLA Ground Force (Blacko & Lee, 2019b).

Thus, if the brigades, or their elements, were to be deployed situationally, either as part of overseas task forces or within one of the PLA theatres, they would be—naturally—subordinated to the commander either of the task force or of the theatre command. This expectation allows for the deduction of the possible roles of the new PLANMC headquarters. While the US Defence Intelligence Agency's threat report *2019 China Military Power* (DIA, 2019, p. 80) expects the new PLANMC headquarters to mainly "oversee the administrative man[anagement], train[ining], and equip[pment] functions of the growing Marine Corps," Iida Masafumi (2019, pp. 2-3) points out that the establishment of the headquarters may reflect a "relatively high degree of autonomy" of the PLANMC anticipated by the PLA/PLAN planners, namely in the areas of planning and implementing operations, planning and conducting exercises, planning equipment procurement, budgeting, and making personnel arrangements.

4.1.2 Sub-Brigade & Battalion-level Reforms

Before 2017, the two PLANMC marine brigades appeared to have roughly same organisational structure and each one consisted, in total, of one or two amphibious armoured battalions, four light infantry battalions, some of which were mechanised, an amphibious reconnaissance unit, probably composed of two or more smaller "frogmen" and special operations units, a self-propelled artillery battalion, a missile

battalion with an anti-tank (AT) missile company and an anti-aircraft (AA) missile company with man-portable surface-to-air missiles, an engineer and chemical defence battalion, a guard and communications battalion and a maintenance battalion. It is important to note, however, that not all of these battalions were directly subordinated to the brigade HQ. The amphibious armoured (tank) battalion, two amphibious mechanized (armoured) infantry battalions, and the self-propelled artillery battalion were grouped together in an organic amphibious armoured regiment, which was considered the main manoeuvre and strike unit of the brigade (Arostegui, 2022, p. 168; Blasko, 2010), while the support elements were subordinated to and at the disposal of the brigade commander.

The new, post-reform marine brigades seem to be more streamlined with flattened chain of command. The amphibious armoured regiment headquarters was eliminated altogether, and command is now passed directly from the brigade level to the battalion level, which corresponds with the reformed structure of the PLA Ground Force units (Blasko & Lee, 2019a).

Currently, the PLANMC marine brigade consists of nine battalions, specifically two amphibious mechanized infantry battalions, a light mechanized infantry battalion, an air assault infantry battalion, a reconnaissance battalion, an artillery battalion, an air defence battalion, an operational support battalion and a service support battalion (Kennedy, 2021, p.5). Manoeuvre core of the brigade is thus likely to consist of the three (or four) combined arms battalions.

However, the equipment of three of the four newly formed ones differs from that of the 1st and the 2nd Marine Brigade. The 6th Marine Brigade also appears to have at least three different types of battalions, not (yet) present in some other brigades. This could indicate that the brigades are not standardised like those of PLA Ground Force Army Groups (Arostegui, 2022, pp.168-170). These differences could, however, be only a temporary phenomenon caused by the ongoing transformation and reequipment with newer, more modern, and or simply different types of equipment (discussed later). For greater clarity, the full organisational structure of the new marine brigade, together with explanatory notes in the right column highlighting the type of the battalions (combined arms, air assault and support/other battalion type), is presented in the table below. The battalions' names in Chinese are added as well.

Table 17. *PLANMC Marine Brigade organisation structure.*

Marine Brigade		***Type***
1	Amphibious mechanized infantry 1st battalion (*liangqi jixiehua bubing yi ying*, 两栖机械化步兵一营)	*Combined Arms*
2	Amphibious mechanized infantry 2nd battalion (*liangqi jixiehua bubing er ying*, 两栖机械化步兵一营)	
3	Light mechanized infantry (3rd) battalion (*qingxing jixiehua bubing ying*, 轻型机械化步兵营)	
4	Air assault infantry battalion (*kongzhong tuji bubing ying*, 空中突击步兵营)	*Air Assault*
5	Reconnaissance battalion (*zhencha ying*, 侦察营)	*Support/Other*
6	Artillery battalion (*paobing ying*, 炮兵营)	
7	Air defence battalion (*fangkong ying*, 防空营)	
8	Operational support battalion (*zuozhan zhiyuan ying*, 作战支援营)	
9	Service support battalion (*qinwu baozhang ying*,勤务保障营)	

(Kennedy, 2021, p. 5)

The combined arms battalions of the brigade, i.e., the two amphibious mechanized infantry battalions and the light mechanized infantry battalion, seem to have standardized structure. Each battalion consists of four mechanized infantry companies, a firepower company, a recon platoon, an air defence element, an artillery element, an engineer element, and a repair team. The addition of the firepower companies, engineers, recon, and air defence elements to the battalion level would allow the battalion to operate independently (Kennedy, 2021, p. 6).

Table 18. *PLANMC combined-arms battalion organisation structure.*

PLANMC combined-arms battalion	
1	1st mechanized infantry company (*ji bu lian*, 机步连)
2	2nd mechanized infantry company (*ji bu lian*, 机步连)
3	3rd mechanized infantry company (*ji bu lian*, 机步连)
4	4th mechanized infantry company (*ji bu lian*, 机步连)
5	Firepower company (*huoli lian*, 火力连)
6	Recon platoon (*zhencha pai*, 侦察排)
7	Air defence element (*fangkong fendui*, 防空分队)
8	Artillery element (*paobing fendui*, 炮兵分队)
9	Engineer element (*gonbing fendui*, 工兵分队)
10	Repair team (xiuli xiaodui, 修理小队)

(Kennedy, 2021, pp. 5-6)

The newly established naval shipborne aviation brigade reportedly consists of at least two flight squadrons (*feixing dadui*, 飞行大队), and an aircraft maintenance group (*jiwu dadui*, 机务大队), but is expected to gradually grow as more helicopters and

pilots are available (Kennedy, 2021, p. 7). The expanding size of the aviation brigade will naturally affect its organisational structure and would thus deserve closer attention in the future.

The development at the battalion level and the introduction of the combined arms standardised battalions to the PLANMC marine brigades reflects the ongoing modernisation trends in the PLA Ground Forces units. The new PLANMC battalions will allow for greater flexibility, interoperability with other marine brigades' battalions and PLA Ground Forces group armies' battalions both, as well as independent deployment of a single battalion if needed.

4.2 New Equipment, New Roles

As the PLAN Marine Corps expands, with changing structure and new brigades, so does grow its vehicle park and continues the modernisation of its equipment. While some of the marine brigades are already combat-ready, others are having difficulties re-equipping for their new roles. The Naval Shipborne Aviation Brigade appears to lag behind in terms of hardware acquisition and the modernisation progresses only very incrementally. The overall development and new hardware fielded by the PLANMC also suggests reorientation towards new roles across a wider spectrum of settings.

4.2.1 Vehicle Park & Equipment Modernisation

As Iida (2022, p. 3) summarizes: "The PLANMC is steadily expanding its equipment inventory, alongside enlarging its units and strengthening the chain of command." Given the state of the PLANMC before reforms, and notably the conversion of coastal defence units of varying quality in terms of equipment into the new marine brigades, the hardware modernisation is continuing slowly. The PLANMC is in the process of retiring older equipment, and gradually replacing it newer amphibious vehicles, such as the tracked ZBD05 Infantry Fighting Vehicle (IFV), tracked ZTD05 Assault Vehicle, PLZ07 122mm Self-Propelled Howitzer, the eight-wheeled ZBL09 IFV, the eight-wheeled ZTL11 assault vehicle, Mengshi Assault Vehicles, and light 8×8 all-terrain-vehicles (Blasko & Lee, 2019a).

The Type 05 amphibious assault vehicle family will likely continue to act as a core of the PLAN Marine Corps' amphibious capabilities. However, while Kennedy (2022, p. 6) states that a standard mechanized infantry company is reported to contain 14 combat

vehicles, for a total of 56 Type-05 vehicles per battalion and thus 112 per brigade (mainly ZBD-05 and ZTD-05), the current numbers are likely below these levels.

While in 2017, at the start of the PLANMC reforms, *The Military Balance* (IISS, 2017, p. 283) recorded 73 ZTD-05s and 152 ZBD-05s in the inventory of the Marine Corps. While the modernisation efforts have, by all accounts, likely continued, together with deliveries of more vehicles, these figures were reiterated in the 2021 issue of *The Military Balance*, as illustrated in the analysis by Iida (2022, p. 4), where the numbers of ZTD-05s and ZBD-05s in service remained seemingly unchanged. Only in 2022 have the figures been reassessed, with the 2023 count remaining the same. Currently, the PLANMC is assessed to have around 80 ZTD-05s and around 240 ZBD-05s (IISS, 2022, p. 260; 2023, p. 242).

The ZBD-05 is an amphibious infantry fighting vehicle (IFV) mounted with a 30-millimeter machine gun, can travel at a speed of about 25 kilometres per hour on water, and can reportedly fire with accuracy even while traveling at sea. Its capabilities are further improved by mounted HJ-73 anti-tank guided missile, which is estimated to penetrate 200 millimetres of rolled homogeneous armour (RHA) at a maximum range of 2,800 km (Iida, 2022, p. 4). These are the basic PLAN Marine Corps IFVs (also used by the PLA Ground Force amphibious brigades), capable of transporting 3 crewmembers and 8 soldiers (Arostegui, 2022, p. 170).

ZBD-05 IFVs are complemented by heavier ZTD-05s, amphibious tanks mounted with a 105-mm guns, that can attack both stationary and mobile targets on land while in water. Furthermore, the ZTD-05 is able to fire armour-piercing (AP) shells and high-explosive antitank (HEAT) rounds, making it effective both against hostile armoured vehicles and fortifications (Iida, 2022, p. 4).

During amphibious operations, these are going to be further supported by PLZ-07B, a 122mm amphibious self-propelled howitzer (Hanson, 2020). The PLZ-07B howitzer' firing elevation ranges from -3 degrees to 70 degrees, allowing the execution of both direct and artillery fire. Its range is approximately 18 kilometres provided a conventional anti-tank howitzer is used. This allows the PLZ-07B to assault enemy positions deeply from the sea, in order to support the ZBD-05s and the ZTD-05s during landing operations (Iida, 2022, p. 4). The number of these is consistently assessed as

at least 20 (IISS, 2017, p. 283; 2023, p. 242), but can be reasonably expected to have risen in the past years as the reforms continued.

The primary purpose of the amphibious vehicles of the Type 05 construction family is to secure a position on a hostile shore (Hanson, 2020). While the Type 05 provides a wide variety of hardware, the PLAN complements them by ZBL-08 IFVs and ZTL-11 assault vehicles, reportedly in the light mechanized infantry battalions, and CS/VP4 "Lynx" all-terrain vehicles in other, unspecified units (Kennedy, 2021, p. 6). Both of these seem to be comparatively newer additions into the inventory of the PLAN Marine Corps. While in 2017 the PLANMC had neither of these vehicles, in 2023 it already had around 50 ZTL-11s and around 150 ZBL-08s in its possessions (IISS, 2017, p. 283; 2023, p. 242).

In July 2018 online images first indicated a new, heavier addition to the PLANMC after a 35-ton ZTQ-15 light tank mounted with 105-mm cannon was spotted in characteristic PLAN Marine Corps blue digital camouflage pattern (Hanson, 2020). Official news report from June 2021 has shown PLANMC brigade members inspecting the ZTQ-15 (Type 15) lightweight battle tank at an undisclosed base, with the report further stating that "an infantry battalion had been re-equipped as a combined-arms battalion," indicating that PLANMC may be continually re-equipping and modernising to fulfil its expanded role (Dominguez, Cranny-Evans, & Cole, 2021). The ZTQ-15, however, is not amphibious and would require a connector between the transport ship and the target destination—a shore. The PLANMC could utilize the growing fleet of air-cushioned landing crafts (LCAC) of the PLAN Surface Force, such as the Type 726 class and the Zubr-class (Hanson, 2020).

Unlike the land and amphibious vehicles, deliveries of hardware to the newly formed Naval Shipborne Aviation Brigade appears to be critically slow. While Blasko & Lee (2019a) stated, that "the new Marine helicopter unit likely has considerably less than a full contingent of aircraft compared to an Army Aviation Brigade, which when fully equipped probably consists of over 70 helicopters" and pointed out that the whole PLA Navy had only little more than 100 helicopters in its entire air fleet in 2018. Iida (2022, p. 6) has similarly noted the insufficient number of helicopters in PLANMC, and pointed out that this may be caused by prioritisation of deliveries to the PLAN Surface Fleet assets, such as the soon-to-be-commissioned aircraft carrier Fujian. According to

The Military Balance 2023, the PLANMC currently has only 5 Z-8C heavy transport helicopters (IISS, 2023, p. 242).

Except for these, the PLANMC Naval Shipborne Aviation Brigade appears to have been equipped with a limited number of Z-8 helicopters. Presently, any further advances within the aviation brigade are only incremental, as the brigade "lacked training grounds, support forces, and pilots" when it was established in 2017, and according to the brigade's deputy chief of staff "everything was started from scratch" (Kennedy, 2021, p. 7).

4.2.2 Role of the PLAN Marine Corps

When it comes to PLANMC's often popularly presumed role in a hypothetical Taiwan invasion scenario, Kennedy (2021) explores this option and assesses that PLAN Marine Corps is not being constructed and modernised for such a scenario:

> The PLANMC does not appear to be optimizing itself for a traditional amphibious landing against Taiwan. The force is smaller than the PLA group armies trained and equipped for a cross-strait invasion. With multiple types of battalions in each brigade, it is not configured for large-scale opposed landing operations. Compared to the PLAA's aviation brigades, the single marine corps aviation brigade, lack of close air support, and the still unconfirmed number of air assault battalions provide very limited vertical envelopment capabilities. More importantly, the expanding missions of the PLANMC are focused overseas. As such, the PLANMC on its own will not be the force that breaks Taiwan (Kennedy, 2021, p.23).

This corresponds with the historical development, as the PLA Ground Force group armies of the Eastern Theatre command, namely the (now newly reorganised) amphibious combined-arms brigades, have held the primary role in the Taiwan invasion scenario, with the PLANMC being traditionally relegated to a secondary role (Lin, 2020).

The current build-up of the PLANMC likely follows several main objectives. The first, a continuation of the original purpose of the Marine Corps, is the capability to defend or attack and seize islands and reefs in the South China Sea, an area of crucial importance for the PRC. This functional area could be extended further to the islands

in the Taiwan Strait and the East China Sea. Second, carrying out expeditionary operations in areas far from the Chinese mainland and protecting "overseas interests," a novel key term in the Chinese military-diplomatic sphere. And third, possible support role in full-scale invasion of Taiwan (Iida, 2022, pp. 6-8). Although inclusion of the PLANMC units in a Taiwan-related scenario would not be unlikely, it arguably is not a satisfactory explanation for the PLANMC expansion.

Likewise, the new equipment and assets fielded by both the PLAN and the PLANMC may suggest an "attempt to replicate the U.S. Navy–Marine Corps team's amphibious ready group and expeditionary strike group" (Hanson, 2020) and as such would most closely correspond with the first and second explanatory scheme. Considering the strategic importance of the South China Sea area (as discussed in the previous chapters), as well as the recent developments including the construction of airbases and military installations on artificial islands, the newly reformed PLANMC could play a key role in complementing other PLAN assets in the region.

4.3 Conclusion

In 2017, the People's Liberation Army Navy Marine Corps has begun the most significant transformation in its history. The PLANMC has begun a process of rapid expansion, from the original 12,000 to approximately 40,000 marines in eight brigades. The PLANMC, now with its own corps-level headquarters, has formed four new Marine Brigades by conversion from PLA Ground Force and Coastal Defence Force units, expanded a PLAN special forces regiment into a PLANMC Special Operations Brigade and formed a new Naval Shipborne Aviation Brigade, which will provide an organic air component to the PLANMC. Simultaneously, the PLANMC has begun a full reorganisation of both brigade-level and battalion-level units, adopting the new combat-arms battalions to form a core of the Marine Brigades.

While the PLANMC continues to modernise its equipment, progressing at a moderate pace in terms of land and amphibious hardware, it remains severely underequipped when it comes to air assets, namely helicopters in the new aviation brigade. It is, however, likely that such deficiencies will be ameliorated in the coming years.

Both the new organisational structure and the newly fielded equipment suggests that the PLANMC is not being expanded and modernised with the intention of taking part

in an immediate large-scale amphibious invasion, e.g., during a Taiwan invasion scenario. On the contrary, the PLANMC is likely to begin 'filling a gap' that the more traditional parts of the PLA, such as the PLA Ground Forces units, cannot be expected to appropriately resolve, namely operations in the South China Sea of both offensive and defensive nature, that could require a smaller, limited number of soldiers but with a wide range of capabilities. Such operations could be aptly fulfilled by independently deployed marine brigade/battalion level task force, in cooperation with the PLAN Surface Force amphibious vessels.

Conclusion

The topic of this thesis was the modernisation of the PLA Navy, the naval arm of the People's Liberation Army, the main component of the Chinese armed forces, with a specific focus on the three key constituent branches of the PLAN, the Surface Force, the Submarine Force, and the Marine Corps.

The primary objective of this thesis was to examine the development and the modernisation of the People's Liberation Army Navy and its key constituent branches and to provide an overall analysis of the Navy's modernisation from the perspective of the theory of offensive realism. The secondary objective of the thesis was to present a quantitative analysis of the vessels and other equipment of the PLAN affected by the ongoing modernisation.

The thesis sought to answer the following research questions: *1) Does the modernisation of the People's Liberation Army Navy align with prescriptions and expectations of offensive realism? If so, how? 2) Which of the analysed branches of the PLAN underwent the most significant transformation within the selected timeframe?*

The theoretical perspective was established in the first chapter. This thesis subscribes to the assertion that the roots of the modernisation of the PLAN can be found in China's need to secure a hegemonic position in the East Asian region and that naval forces will play a key role in preventing a rival power—the United States—from interfering and preventing China's hegemonic ambition. This competition is to take place on an uneven playing field, which leads both rivals, albeit vying for the same goal, to structure their forces in a different manner. China will utilize its naval forces in order to prevent its rival from achieving command of the sea, and therefore block it from projecting its power into the region. To insulate the region from external forces, in which China will attempt to realize its hegemonic ambition, sea-denial strategies will be employed. Furthermore, these strategies would survive the possible resolution of the Taiwan, Senkaku/Diaoyu and Spratly issues, even if the resolution was reached according to Chinese terms. While not irrelevant, these matters of concern are not the motivating factors behind PLAN modernisation, as demonstrated by the ongoing development of the force itself, namely its amphibious component.

The second, third and fourth chapters analysed the modernisation and the ongoing developments of the three examined branches of the PLAN: the Surface Force, the Submarine Force, and the Marine Corps, respectively. Jointly, these chapters have jointly contributed to the fulfilment of the set-out goals and to the formulation of the answers to the research questions. The quantitative analysis of the vessels and other equipment affected by the ongoing modernisation process is presented systematically in each respective chapter and or section of a chapter.

The first research question (*Does the modernisation of the People's Liberation Army Navy align with prescriptions and expectations of offensive realism? If so, how?*) can be answered by contrasting the modernisation undergone by the analysed PLAN branches, as summarised in the conclusions of each respective chapter, and the expectations of the offensive realism, as laid out in the first, theoretical chapter of the thesis. Arguably, the modernisation of the People's Liberation Army Navy does align with the prescriptions and expectations of offensive realism. The emphasis on modernising and expanding the surface fleet, especially the vessels with significant anti-ship and anti-air capabilities, as well as incremental modernisation of the mine warfare fleet, all of which could be utilized for anti-access/area denial strategies, points toward alignment with the theoretical expectations of offensive realism. These are further underlined by the apparent lack of focus on modernising and no observable commitment to building up the landing ships and landing crafts fleet, that would be necessary for a successful invasion of Taiwan—if one were to take place in the foreseeable future. These developments are complemented by the build-up of the People's Liberation Army Marine Corps, whose chief purpose will be most likely realised in the strategically important area of the South China Sea. The said region is also of significant importance to the People's Liberation Army Navy Submarine Force, namely the nuclear-powered ballistic missile submarines, which are a key part of the Chinese nuclear deterrent.

The second research question (*Which of the analysed branches of the PLAN underwent the most significant transformation within the selected timeframe?*) can be answered from two different points of view, i.e., in relative and absolute terms. In relative terms, the People's Liberation Army Navy Marine Corps has, arguably, undergone the most significant transformation within the selected timeframe, as the modernisation and reform process has affected the Marine Corps in its entirety. The PLANMC has been

expanded from two to eight brigades and approximately quadrupled in terms of personnel, the brigades and subordinate battalions have been completely reformed with a new structure introduced, vehicle park expansion is continuing, an organic aviation element is being formed and naval special forces regiment has been upgraded to a brigade and subordinated to the Marine Corps. In absolute terms, the People's Liberation Army Navy Surface Force has been the biggest benefactor of the ongoing modernisation. Within the past decade, its transformation has included the introduction of the second aircraft carrier, a brand new cruiser class, overhaul of the destroyer force and the commissioning of a modern, up-to-date destroyer class with 25 units already in service, significant modernisation of the frigate fleet and an unprecedented build-up of more than seventy corvettes, of which fifty remain with the People's Liberation Army Navy, the introduction of large amphibious warfare vessels, including a new class of landing helicopter docks, commissioning of more landing platform docks, and modernisation of the mine warfare fleet. The People's Liberation Army Navy Submarine Force, while a part of the modernisation process, has not been subjected to such a broad overhaul as the Marine Corps or to a comparable quantitative build-up as the Surface Force.

The modernisation of the People's Liberation Army Navy will most certainly continue at pace. The third aircraft carrier is nearing its commissioning, while a fourth one could enter active service before the end of this decade. The construction of destroyers and other surface ships continues, and the PLAN Marine Corps carries on with its build-up. All these aspects, as analysed in this thesis, add to the slowly shifting balance of power in the Western Pacific and growing tension in the region. As the modernisation of the Chinese People's Liberation Army continues, the importance of the topic only grows. This thesis has, hopefully, helped to create a connection between the broadness of an international relations' theoretical study and a narrower analysis of the military-technical aspects of an armed forces branch modernisation.

The topic of modernisation of the People's Liberation Army in general, and the People's Liberation Army Navy in particular, will no doubt continue to be of utmost importance in the light of growing Chinese naval might. As such, it is most suitable for further study.

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Abstrakt

Modernizace Námořnictva Čínské lidové osvobozenecké armády v éře Si Ťin-pchinga: perspektiva ofenzivního realismu

Téma modernizace Námořnictva Čínské lidové osvobozenecké armády (NČLOA) stále více roste na významu, a to jak s ohledem na pozornost Si Ťin-pchingovy administrativy postupně se ubírající do oceánských oblastí, tak i s ohledem na rostoucí napětí v regionu východní a jihovýchodní Asie. Tato práce zkoumá vývoj a modernizaci klíčových složek Námořnictva Čínské lidové osvobozenecké armády, Hladinových sil, Ponorkových sil, a Námořní pěchoty, a poskytuje celkovou analýzu modernizace námořnictva z pohledu teorie ofenzivního realismu. Práce tvrdí, že předpoklady ofenzivního realismu o chování státu v anarchickém mezinárodním systému jsou relevantní pro pochopení faktorů motivujících probíhající modernizací čínských námořních sil. Potřeba Číny zajistit regionální hegemonii vyvolává odpor ze strany samotných regionálních aktérů i ze strany vzdálené velmoci – Spojených států – snažících se zabránit vzestupu rovnocenného konkurenta. To se promítá do architektury čínské flotily a priorit modernizace: posílení hladinových sil spolu se schopnostmi upření přístupu do námořní oblasti, rozšiřování Námořní pěchoty a její restrukturalizace pro operace v Jihočínském moři, a náprava nedostatků ponorkové flotily. Upozadění menších výsadkových plavidel naznačuje, že scénář obojživelné invaze na Tchaj-wan není faktorem motivující současný modernizační proces.

Klíčová slova: Námořnictvo ČLOA, modernizace, ofenzivní realismus, hegemonie, Čína

Abstract

Modernisation of the Chinese People's Liberation Army Navy in Xi Jinping's era: An Offensive Realist Perspective

The topic of modernisation of the Chinese People's Liberation Army Navy (PLAN) is becoming increasingly relevant, both with regard to the focus of Xi Jinping's administration gradually shifting towards oceanic areas and the growing tensions in the East and Southeast Asia region. This thesis examines the development and the modernisation of the People's Liberation Army Navy's key constituent branches, the Surface Force, the Submarine Force, and the Marine Corps, and provides an overall analysis of the Navy's modernisation from the perspective of the theory of offensive realism. The thesis asserts that the offensive realist assumptions about state behaviour in an anarchic international system are relevant for understanding the motivating factors behind the ongoing modernisation of the Chinese naval forces. China's need to secure regional hegemony induces resistance from the regional actors themselves, as well as from a distant great power—the United States—trying to prevent the rise of a peer competitor. This translates into the Chinese fleet architecture and modernisation priorities: the strengthening of the surface forces along the sea-denial capabilities, the expansion of the Marine Corps and its restructuring for operations in the South China Sea, and the amelioration of the submarine fleet's deficiencies. The sidelining of smaller amphibious warfare vessels indicates that a Taiwan amphibious invasion scenario is not a motivating factor in the current modernisation process.

Key Words: PLA Navy, modernisation, offensive realism, hegemony, China