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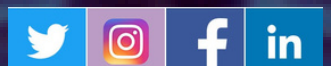
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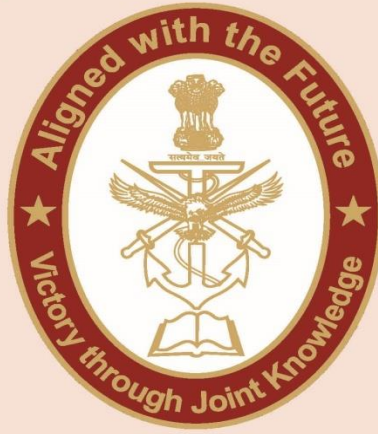
# THE BATTLE OF NUCLEAR SUBMARINES IN THE INDO- PACIFIC

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# CENTRE FOR JOINT WARFARE STUDIES



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### THE BATTLE OF NUCLEAR SUBMARINES IN THE INDO- PACIFIC



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### Abstract

*India's recent commissioning of its second Arihant-class nuclear ballistic missile submarine (SSBN), INS Arighaat, on alongside plans to commission a third by 2025, signals a major stride in the modernization of its navy. This development coincides with China's expanding presence in the Indian Ocean and South China Sea, creating a competitive dynamic between the two nations. As China's navy becomes increasingly assertive, India faces mounting pressure not only to enhance its submarine fleet but also to accelerate the acquisition process. This analysis explores the potential impact of India's expanding nuclear submarine fleet on Indo-Pacific geopolitics, focusing on how China and Pakistan may respond. Additionally, it examines the role of QUAD member countries in reinforcing their strategic position in the region and concludes with recommendations to address the evolving security challenges in the Indo-Pacific.*

### Introduction

INS Arighaat, developed under India's Advanced Technology Vessel (ATV) project, was commissioned at the Shipbuilding Centre in Visakhapatnam.<sup>1</sup> As India's second

nuclear-powered submarine, it is equipped with a pressurized water reactor (PWR). With a displacement of 6,000 tonnes and a length of 112 meters<sup>ii</sup>, INS Arighaat's addition to the Indian Navy places India among a select group of nations—such as the United States, Russia, China, the United Kingdom, and France—that possess more than one nuclear-powered submarine capabilities.<sup>iii</sup> It has four launch tubes that can carry around 12 K-15 Sagarika submarine launched ballistic missiles (750 Km) or around four K-4 missiles (3500 Km).<sup>iv</sup> This development significantly bolsters India's maritime power projection and positions it as one of the top naval forces globally.

With the addition of one more SSBNs, India's nuclear second-strike capability has significantly enhanced. Nuclear submarines, with their ability to remain submerged and undetected for extended periods, provide a robust deterrence by ensuring a nation's ability to retaliate in the event of a nuclear attack<sup>v</sup>. This stealthy underwater endurance is pivotal to India's nuclear triad, which ensures a credible deterrent via land, sea, and air. India's land-based intercontinental ballistic missile program, featuring systems such as Agni-IV and Agni-V, has already proven highly effective.<sup>vi</sup> The commissioning of INS Arighaat—which translates to "Destroyer of the Enemy" in Sanskrit—further strengthens the security of India's maritime domain, playing a crucial role in fortifying the nation's strategic defense capabilities.<sup>vii</sup>

With the induction of INS Arihant in August 2016 and the subsequent inclusion of INS Arighaat, India now possesses the capability to continuously maintain an operational nuclear-powered submarine at sea, ensuring consistent maritime deterrence.<sup>viii</sup> The presence of one SSBN in operational patrol while the other undergoes maintenance guarantees that India's strategic maritime security is uncompromised. This dual deployment capability enables India to assert its presence effectively in both the Arabian Sea and the Bay of Bengal, enhancing regional security and contributing to India's broader maritime strategy.<sup>ix</sup>

While India is poised to project its strategic presence in the Indian Ocean and maintain its status as a regional power, it must take more substantial measures to match China's expanding naval influence in the Indo-Pacific.<sup>x</sup> In terms of both quantity and acquisition speed, India faces a considerable gap. Over the past three decades, China has exponentially expanded its navy, now leading the world in the number of naval vessels.<sup>xi</sup> China, with its clear ambition to challenge U.S. dominance, has heavily

invested in modernizing its naval capabilities. Aligned with China's growing influence is Pakistan, which continues to work toward neutralizing India's strategic advantage in the Indian Ocean, particularly in the Arabian Sea, by rapidly expanding its own maritime assets.<sup>xii</sup>

One significant advantage India currently holds is its strategic alignment with like-minded nations through the Quadrilateral Security Dialogue (QUAD), which includes the United States, Australia, Japan, and India.<sup>xiii</sup> These countries share the explicit objective of upholding a "rules-based order" in the Indo-Pacific, with the implicit aim of countering China's growing influence.<sup>xiv</sup> While this partnership provides India with a valuable opportunity to enhance its capabilities alongside its partners, it also generates a degree of pressure to avoid over-reliance on external actors for its strategic concerns. Whether it pertains to border security or ensuring the protection of international trade routes through the Indian Ocean, it remains essential for India to independently invest in and expedite its naval modernization to maintain a robust and autonomous security posture.

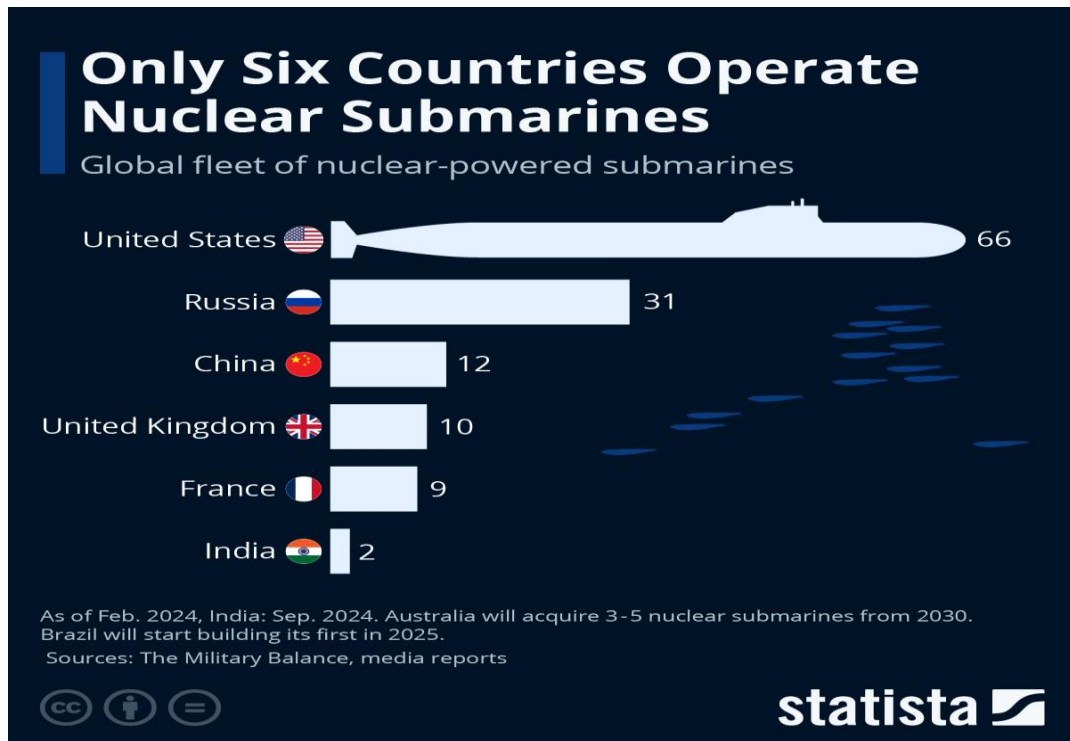
### **China-Pakistan Conundrum**

China possesses the largest maritime combat fleet globally, comprising a total of approximately 234 warships.<sup>xv</sup> Among these are 12 nuclear-powered submarines, which include six Jing-class (Type 094) ballistic missile submarines (SSBN) and six nuclear-powered attack submarines (SSN).<sup>xvi</sup> When comparing the dimensions and capabilities of these vessels, it is noteworthy that the Jing-class submarines, are significantly larger than India's Arihant-class SSBN.<sup>xvii</sup> Specifically, the Jing-class submarines measure around 135 meters in length and have a displacement of approximately 8,000 tonnes.<sup>xviii</sup> At the same time type 094 class submarine engine produces around 150-175 MW of energy as compared to the Arihant class which produces 83 MW.<sup>xix</sup> This size advantage underscores China's substantial maritime capabilities and highlights the strategic differences in the naval forces of the two nations.

China began its development of ballistic missile submarines (SSBN) early on, leveraging support from the Soviet Union.<sup>xx</sup> The nation commissioned Asia's first domestically designed and built SSBN, the Xia-class (Type 092), in 1983.<sup>xxi</sup> Since that

initial development, China has made significant advancements in its naval capabilities. One of the key advantages for China lies in its robust indigenous shipbuilding capacity. The speed and scale at which China is producing submarines is unprecedented in contemporary times. Currently, China boasts a total of 60 operational submarines, which comprise 12 nuclear-powered submarines and 48 diesel-electric submarines.<sup>xxii</sup> According to various projections, China is expected to possess approximately 65 submarines by 2025, with the number potentially increasing to an impressive 80 by 2035.<sup>xxiii</sup>

While numerical superiority alone does not determine the outcome of military conflicts, a recent study analyzing 28 historical wars found that the nation with the larger naval fleet emerged victorious in 25 instances.<sup>xxiv</sup> This finding suggests that countries with a greater number of vessels possess a larger margin for error and a greater capacity to adjust their strategies during conflicts.<sup>xxv</sup> Consequently, should tensions escalate to the brink of nuclear war, China is likely to have a more favourable position in maintaining deterrence through both denial and punishment strategies.



Source: The Military Balance, Media Reports

URL: <https://www.statista.com/chart/29489/number-of-nuclear-powered-submarines-worldwide/#:~:text=Data%20from%20the%20International%20Institute,at%20the%20st art%20of%202024.>

In addition to its numerical superiority, China benefits from the capability to operate its warships for extended periods, as approximately 70% of its fleet was commissioned after 2010.<sup>xxvi</sup> This relatively recent induction enhances the operational lifespan and effectiveness of China's naval forces. Currently, Pakistan does not operate any nuclear-powered submarines; however, India's induction of two SSBNs has generated a sense of insecurity in Islamabad.<sup>xxvii</sup> Pakistan accuses New Delhi of destabilizing the region through aggressive militarization. In response to these developments, Pakistan is collaborating with China to construct new stealth submarines, designated as the Hangor class.<sup>xxviii</sup> These submarines are equipped with the capability to launch the Babur-3 cruise missile, which has a range of 450 kilometers.<sup>xxix</sup> This advancement poses a challenge for India in ensuring the security of its strategic assets.

One of the primary concerns articulated by numerous analysts and defense experts is the potential for China to provide nuclear-powered submarines to Pakistan for operations in the Arabian Sea.<sup>xxx</sup> It is widely recognized that China has historically assisted Pakistan in acquiring nuclear weapons.<sup>xxxi</sup> Islamabad's pursuit of enhanced second-strike capabilities against India is likely to drive Pakistan to seek such arrangements with China, which could introduce a new array of challenges for India. This not only increases the chances of an arms race in South Asia but also increases chances of instability due to increased distrust between Delhi and Islamabad. Moreover, China's presence in the Indian Ocean has been steadily increasing. Initially initiated as an anti-piracy operation aimed at safeguarding trading vessels traversing the Gulf of Aden and the Red Sea, China's maritime activities have expanded significantly.<sup>xxxii</sup> This escalation has manifested through the deployment of experimental vessels and the establishment of a military base in Djibouti.

While many analysts do not consider Pakistan to be the primary threat to India's strategic security, they assert that India is increasingly focused on China when making decisions and formulating plans. Abhijit Singh from ORF Mumbai states, "The true impetus for India's expansion of its second-strike capabilities is, in fact, the simultaneous growth of the Pakistani and Chinese navies in the Indian Ocean in recent times."<sup>xxxiii</sup>

## **Partners in the Indo-Pacific: QUAD and AUKUS**

The geopolitics of the Indo-Pacific region centres on China and the various nations seeking to counter its influence. The establishment of the Quadrilateral Security Dialogue (QUAD), comprising India, Japan, Australia, and the United States, was primarily driven by concerns regarding China's expansion during the first decade of the 21st century.<sup>xxxiv</sup> What initially began as the Malabar exercise has since evolved to encompass a comprehensive approach to national security, addressing both traditional and non-traditional dimensions across various facets.<sup>xxxv</sup>

What is particularly critical is the deepening of security relations among QUAD member countries. India's hesitance to enter into formal alliance agreements has been a significant factor inhibiting QUAD from evolving into a comprehensive security grouping. The establishment of AUKUS has, in some respects, mitigated this challenge.<sup>xxxvi</sup> The agreement to provide (Building the manufacturing facility in Australia) nuclear-powered submarines to Australia from the UK and the US is poised to rebalance power dynamics in the Indo-Pacific region, particularly against the backdrop of China's growing influence, which currently appears to dominate the landscape in terms of numerical strength.<sup>xxxvii</sup> Some analysts argue that the AUKUS will only lead to arms race in the Indo-Pacific region and will contribute to increased instability. While some observe this might increase the chances of nuclear proliferation countries like South Korea and Japan started building their nuclear submarine programs as they both feared the combined nuclear build-up in the East China Sea of North Korea and China. But from India's point of view, this development has actually reduced the burden from India's shoulders as one of its QUAD partners is now gearing up to balance China in the region.

By 2030, the combined strength of nuclear submarines belonging to India, Australia, and the United States is projected to be approximately 74, contingent on the number of submarines delivered to Australia.<sup>xxxviii</sup> Given the extensive deployment of the US Navy all over the world, this might not be able to challenge China in terms of numbers but this figure remains significant for the QUAD countries as they can put a strong front against the challenges posed by China on a daily basis. The numerical strength will enhance the deterrence capability of the QUAD member countries as it will act as "deterrence by denial" in the face of aggression in the region by China.

## **India's Future Plan**

India is progressing towards the development of two additional nuclear-powered ballistic missile submarines (SSBN) as part of its ambitious Advanced Technology Vessel (ATV) Program.<sup>xxix</sup> The next SSBN, INS Aridhaman, is anticipated to be commissioned in early next year and is currently undergoing trials.<sup>xl</sup> This development will significantly enhance India's position in the global defense arena and enable the country to maintain its deterrence capabilities more effectively. Meanwhile, the fourth SSBN is under construction and is projected to be larger and more advanced than its three predecessors. This vessel is expected to weigh approximately 13,500 tonnes and will possess the capability to carry 12 to 16 K-4/K-5 missiles.<sup>xli</sup>

India under its project 75 alpha is also aiming to build six 6000 tonnes nuclear attack submarines (SSN).<sup>xlii</sup> It got approval from the government in 2015. Some reports claim that submarines built under this program will be equipped with under water drone, sophisticated stealth features, and counter-mine warfare.<sup>xliii</sup> This will revolutionize the India's defensive and offensive capabilities to a greater extent. The main source of concern for the Indian Navy is the considerable delays in the supply of new submarines. Numerous obstacles have been encountered by this ambitious effort, which eventually put this plan backstage. India has to expedite the delivery of its submarines in order to successfully compete with China's existing capabilities, particularly its fleet of Attack Submarines (SSN) and Submersible Ship Ballistic Nuclear (SSBN). Maintaining strategic parity in the region depends on prompt delivery, so it is imperative that there are no more delays.

India has to strengthen its underwater capabilities more and more as the geopolitical environment changes. The present delays affect India's broader marine policy in addition to impeding operational readiness. India's navy leadership understands the need to expedite the submarine procurement process in order to ensure that the fleet is outfitted and operational on time, especially in light of China's advancements.

## **Recommendations**

As part of its Aatmanirbhar Bharat initiative, India is actively developing its indigenous capabilities for submarine production. In the long run, this effort will bolster India's position on the global stage. However, in the interim, it is crucial for India to address



the challenges posed by China in the Indo-Pacific, where China currently outpaces India in terms of both the number and capabilities of nuclear submarines. To enhance its standing in the nuclear submarine domain, India could consider the following steps, balancing both short-term and long-term strategies.

- **Strengthening Strategic Partnership:** India should explore partnerships with nations such as France and the United States to facilitate the operation of Submersible ship ballistic nuclear submarines (SSBNs).<sup>xliv</sup> Such collaborations would enable India to maintain a minimum fleet of 3 to 4 submarines at all times while it develops its own capabilities. This approach would not only address the challenge posed by China in the Bay of Bengal but also ensure continuous surveillance over Pakistan in the Arabian Sea.

By ensuring the continuous presence of SSBN in the Indian Ocean, India can enhance its deterrence posture against both China and Pakistan. These agreements can also ensure greater interoperability in the case of conflicts as it can facilitate regular joint exercises and operations synergies. This will not only help India enhance its experience in submarine warfare but will also train its naval personnel to operate better in a critical situation learning from the experience of partner countries.

- **Upgrading the Logistics and Support Agreements:** India has already established logistics and support facility agreements with countries such as Australia, Japan, Singapore, and the United States for the docking and maintenance of ships. It is advisable for India to consider upgrading these agreements to include specific provisions for nuclear submarines. Such enhancements would ensure timely logistical support and minimize response times in the event of an emergency.

In the event of complex geopolitical and security tensions, having secured and pre-arranged agreements on support and maintenance with partner countries will ensure effective operations and better coordination. This will not only solve the unforeseen challenges that might come up in case of logistical delays, but maintaining Maintenance, Repair, and Operations (MRO) is as crucial as responding to any threats in the region.

- **Capacity Building Among Regional Partners:** India should focus on capacity building among regional partners to enhance their naval capabilities, which would not only strengthen collective security in the Indo-Pacific but also alleviate some of the pressure on India. Engaging with the Philippines would be an initial step in this direction, especially given the ongoing confrontations between the Chinese Coast Guard and the Philippine Navy.<sup>xlv</sup> Such engagement would likely be welcomed by the Philippines, as it demonstrates India's commitment to regional security. By providing technology transfer, training, and regular joint exercises with regional partners India can ensure regional allies of their maritime interests. This will also enhance their capacity to respond to the aggression of China effectively. This will not only build a better network of countries allied together against common concerns but will also enhance India's position as a country committed to peace, regional security and stability. Enhanced engagement and better naval capability will contribute to maintaining balanced power dynamics in the Indo-Pacific region.
- **Upgrading Submarines with AIP Systems:** As India works towards acquiring 4 to 5 SSBNs and 6 SSNs, it is crucial to upgrade its diesel-electric submarines with Air Independent Propulsion (AIP) systems.<sup>xlvi</sup> This upgradation will significantly improve the stealth and endurance of any diesel-electric submarines as they can now operate for an extended period of time without requiring them to come to surface which is very essential, especially in the contested waters of the South China Sea and other regions in the Indo-Pacific. Any delays in this process will weaken India's strategic position, especially considering that China is already ahead in this area. Out of its 48 submarines, 21 are already equipped with AIP systems.<sup>xlvii</sup> So upgrading the current fleet of submarines will ensure Indian navy to conduct prolonged operations in the Arabian Sea and Bay of Bengal.
- **Support Procurement of the New Submarines:** Defense purchase procedures must be streamlined and given top priority in order to facilitate the Indian Navy's acquisition of new submarines. To ensure that the newest technology and capabilities are integrated, a specialised task force should be formed to coordinate with both domestic and foreign shipbuilding companies. In order to boost indigenous manufacturing, the government must both encourage Indian

private companies to joint venture with foreign companies of France, the United Kingdom, the United States, and Germany. Modern stealth, sonar, and missile systems should also be integrated as a primary priority to strengthen India's marine capabilities, improving defence readiness and strategic deterrence in the Indo-Pacific region. On-time delivery will be ensured by clear procedures and regular reviews.

- **Achieving Fleet Commonality:** orders of existing submarines should be repeated with focusing on adding new technology and weapons, streamlining fleet operations and guaranteeing consistency in systems, designs, and logistics. This will make ensures operations more effective by streamlining maintenance, simplifying training, and improving interoperability among submarines. The Indian Navy can maintain and enhance specialised skills and among its people and technical teams, leading to increased proficiency in managing, maintaining, and modernising the fleet by continuing to manufacture the same class of nuclear and diesel-electric submarines. The defence procurement process can be made more effective by reordering proven designs with improved research and designs in-house.

## Conclusion

India must take a strong and proactive stance in light of the changing balance of naval power in the Indo-Pacific, which is defined by China's aggressive expansion and Pakistan's strategic manoeuvres.<sup>xlviii</sup> The commissioning of INS Arighaat recently and the ongoing building of further SSBNs under the Advanced Technology Vessel Program are testaments to India's will to fortify its maritime interests and improve its naval capabilities.<sup>xlix</sup> However, India has to give top priority to speeding up its submarine modernisation activities, particularly the integration of Air Independent Propulsion systems in its diesel-electric fleet, in order to successfully confront the dual challenges posed by China and Pakistan.<sup>l</sup>

Further, India can strengthen its deterrent capabilities while guaranteeing a minimum operational fleet of nuclear submarines through strategic relationships within the QUAD framework and possible collaborations with countries such as the US and France.<sup>li</sup> These partnerships support a regional framework for collective security while also

facilitating technological developments. Developing naval capabilities with regional allies, especially the Philippines, improves the strategic environment and makes the Indo-Pacific area safer.

In the end, India's emphasis on upholding a self-sufficient security stance via domestic growth and strategic alliances would be crucial for negotiating the intricate geopolitical dynamics of the Indo-Pacific. In the face of growing difficulties, India can assert its position as a formidable maritime power, preserving stability and upholding a rules-based system by taking immediate action to increase its naval capabilities and promote regional collaboration. In order to protect its interests as a nation and make a good contribution to the Indo-Pacific region's collective security in the years to come, India will need to adopt this diversified strategy.

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