CHARTING THE COURSE: PAKISTAN'S NAVAL MODERNISATION FOR A SECURE MARITIME FUTURE

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Abstract

Despite the financial and fiscal turmoil, the continuum of Pakistan's naval program is a precursor of the shift in its maritime strategic priorities. The shift from an offensive sea-denial strategy towards maintaining a sustained presence in the Indian Ocean Region (IOR) indicates renewed strategic priorities of protecting its vested maritime interests. The induction of Chinese-made frigates, submarines, and unmanned aerial platforms indicates Pakistan's anticipation of the changing security environment in IOR and numerical inferiority visa Vis India. Drawing examples from recent maritime conflicts in the Black Sea and naval force buildup in IOR, the paper proceeds to chart the course of modernization, especially in the context of unmanned Sea Vehicles and fostering public-private partnerships to meet the forthcoming challenges. Therefore, the study argues that the efforts to overhaul its existing naval fleet will chart the course for Pakistan's naval interests and quest for a secure maritime future.

Keywords: *Naval Modernisation, Indian Ocean Region, Maritime Security, Unmanned Systems, Deterrence*

Introduction

The geopolitical debates surrounding the IOR increasingly feature China and India's naval modernisation. Amidst this talk of town, little attention has been paid to Pakistan's naval capabilities. Despite the ongoing financial and political turmoil, the ongoing modernisation has shifted the focus of the Pakistan Navy from a force focused on coastal defense towards having a sustained presence to protect its maritime interests. Having cordiality and a mutual strategic purview with China, the induction of new frigates, corvettes, submarines, and unmanned aerial platforms will boost the existing capabilities of the

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Pakistan Navy, eventually augmenting its aim to maintain a sustained presence in the IOR. These efforts clearly indicate Pakistan's quest for a secure maritime future. Despite the country's efforts to modernise its fleet, it has been largely eluded from the contemporary naval mandarins. The prevailing Indo-centric threat perception, a complex interplay of great power politics, and the realisation of numerical inferiority visa vis India influence Pakistan's naval decisions that attain broader geostrategic imperatives.

Over the last two decades, Pakistan and China have pursued an ambitious agenda regarding maritime cooperation. It involves procuring technologically advanced Yuan class Type 039/41 class submarines through a $5 billion deal in 2016.[1] Pakistan is scheduled to procure eight submarines from China to strengthen its undersea capabilities. China's Shipping Industry Corporation is building the first four, while the remaining will be made in Karachi's shipyard, augmenting Pakistan's indigenous capabilities. These submarines are armed with advanced sensors and armaments, which will help Pakistan tilt the tactical balance of power in its favour. Considering these developments, Pakistan's maritime strategy is cognisant of the evolving maritime renaissance in the IOR. However, despite Pakistan's interest in procuring novel technologies, it largely remains a defensive force focused on coastal defense and sea denial. In addition, the Pakistan navy is vulnerable to offensive actions by the numerically and technically superior Indian navy. Currently, Pakistan cannot match its archrival India in its naval capabilities. Then there is a history of being flanked by the Indian Navy during the past Indo-Pak Wars, where Pakistan's maritime borders were subject to repeated intrusions and blockades. This is not to assert that Pakistan would seek a blue water naval force, but rather a formidable brown water navy that could efficiently protect the maritime territory and, if needed, employ a deep strike capability or ensure sea denial to adversarial naval assets. Nonetheless, its cooperation with China and Turkey will help transform it into a credible regional maritime power.

The study argues that the changing regional dynamics coupled with India's naval buildup in the IOR provide a pretext for Pakistan to chart its course for maritime modernisation. With the inherent sense of insecurity, strategic anxieties, and vulnerability in the face of a technologically superior Indian navy, Pakistan aims to transform its navy from a defensive force towards a force able to sustain its presence and project its power in the IOR. Therefore, the current defense overhaul will enable Pakistan's navy to patrol its sea lanes, combat piracy, foster international cooperation, and protect its maritime interests in the IOR.

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1 Reuters, "Pakistan PM approves deal to buy eight Chinese submarines: official," April 2, 2015, https://www.reuters.com/article/

Methodology

The study is based on qualitative research methods. Data is primarily gathered through secondary sources such as books, journal articles, reports, media outlets and dissertations. Commentaries, newspaper articles and media reports have been added to facilitate the expert analysis of Pakistan's naval modernisation. Moreover, thematic analysis was used to analyse the data extracted from the secondary sources.

Pakistan's Naval Modernisation

"A strong navy we have always regarded as our proper first line of defense." Franklin D. Roosevelt's quote harbingers the significance of a country having a strong navy.[2] Pakistan is undergoing political instability and economic uncertainty crisis. This is evident from its precariously depleting foreign exchange reserves and economic instability. Pakistan was struggling to get the IMF bailout package to avoid a financial default two years back. However, despite all the entailing inconveniences, Pakistan's naval modernisation program has been on track.[3] The induction of Type 054-A/P frigates will consolidate navy's power projection capabilities in the face of an under-resourced fleet.[4] The frigates are equipped with advanced HHQ-16 surface-to-air missile systems and P-282 supersonic anti-ship weapons superior to the previous ones deployed on the existing PNS-Zulfiqar. Moreover, these systems have also been developed to withstand the threats from India's BrahMos supersonic anti-ship projectiles and budding carrier capabilities. With these developments, Pakistan expects a complete overhaul of its naval fleet by the end of this decade.

Historically, Pakistan's navy was overshadowed due to the primacy of land forces. The navy received lesser funds than other arms and was primarily a defensive force to guard the littorals against air and seaborne aggression. However, the shifting geopolitical tectonics and growing maritime significance in the IOR have brought the dwarfed fleet into the limelight. The guided-missile frigate Tughril—the most sophisticated vessel-- was inducted into the existing fleet in January 2022. Armed with both surface-to-air and supersonic surface-to-surface missiles, the vessel is equipped to undertake critical missions, including anti-surface warfare, anti-submarine warfare, anti-aircraft warfare, and low

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2 Naval History and Heritage Command, "Famous Navy Quotations," accessed on August 31, 2024, https://www.history.navy.mil/browse-by-topic/heritage/ famous-navy-quotations.html

3 Usman Ansari, "Outgoing Pakistan Navy Chief Reveals Details Of Modernization Program," Defense News, last modified October 15, 2020,

4 Usman Ansari, "Pakistan Receives New Chinese Made Frigate. How It Will Fare Against India's Navy?" Defense News, last modified November 9, 2021, \

radar observability. Tughril Class is the most formidable induction in Pakistan's naval fleet. Despite the numerical inferiority and lack of capabilities to match India's burgeoning naval capabilities, these frigates have enabled the Pakistan navy to undertake operations in far-off waters.

Lately, Pakistan also commissioned PNS Taimur armed with HHQ-16 and P-282/CM-401 to counter India's Brahmos supersonic missiles and growing career capabilities. In addition, the Pakistan Navy is expecting to induct a more robust platform to overcome its fleet weakness in terms of malfunctioning engines, obsolete imaging equipment, and radar challenges coupled with other technological pitfalls. Recently, the Pakistan Navy commissioned its first MILGEM-class Babur corvettes, to enhance potency in the navy's operational efficiency. President Asif Ali Zardari stated that employing state-of-the-art vessels is a significant milestone that matches its ever-growing operational responsibilities. Furthermore, Pakistan is eyeing to develop its Jinnah-class frigate in collaboration with Turkish partners. These frigates are expected to be delivered to Pakistan over the next five years.[5]

Amidst the modernization drive, the Pakistan Navy realize the significance of building indigenous capabilities. According to Pakistan's naval chief office, Pakistan needs to focus on indigenisation and rely on diverse sources to mitigate its dependence on external sources and fulfill operational needs. This strategy will help Pakistan chart its needs and navigate the financial bottlenecks. Despite having an indigenous naval program, the local industry is limited to a handful of onboard systems, and steel production is not taking place locally. Despite all the efforts, questions arise regarding the viability of air defense and sub-marine hunting capabilities. The existing FM-90B has a limited firing range of 15 km[6], making it hard to intercept the incoming anti-ship missiles, thereby compromising the frigate's air defense capabilities. Likewise, the submarine hunting capability is hindered due to the greater acoustic signature of a diesel-powered engine of Zulfiqar-class frigates (F-22P).

On the other hand, the advent of UAVs has transformed the dynamics of warfare in the air, sea, and land. Visuals from the Russia-Ukraine war and the Nagorno-Karabakh conflict demonstrate how the legacy battle systems, such as frigates, ships, and tanks, were helpless against the relentless precision of drones. Notably, Russia's colossal Black Sea Fleet was continuously battered by the untethered assaults by Ukraine drones. The modified explosive-laden jet skis proved lethal against

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5 Global Defence News, "Pakistan to start JCF Project with Karachi Shipyard," September 30, 2023, https://turdef.com/article/pakistan-starts-jcf-

6 Missile Defense Advocacy Alliance, "Missile Threat and Proliferation," assessed on October 1, 2024, https://missiledefenseadvocacy.org/missile-threat-and-proliferation/todays-missile-threat/

Russia's guided class cruisers.[7] These changing trends have prompted the Navy to acquire robust UAV platforms to upgrade the existing inventory. In this regard, it acquired the CH-4, which is a medium altitude long-range endurance (MALE) drone acquired by China. Similarly, domestic efforts are underway to develop nuanced surface and underwater vehicles.[8] Moreover, Pakistan's Bahria Boat Building Yard developed the first domestically manufactured 12T marine assault boat as a part of a technology transfer agreement with Polish company Techno Marine.[9]

These developments indicate that the Navy is aware of the changing regional dynamics, fluctuating military balance, and growing responsibilities in the IOR. The increasing challenges to combat piracy, maintain freedom of navigation, preserve maritime interests, and power projection in the IOR require a robust naval force able to conduct maritime intelligence, surveillance, and reconnaissance missions. Similarly, a robust naval presence in the IOR will also help pursue blue diplomacy in international waters, transforming it into a solid regional force in the tense geopolitical environment.

Induction of New Platforms

Tughril Class/Type 054-A

The Type 054-A is acknowledged as the backbone of the People's Liberation Army Navy (PLAN) fleet. It is a high-end naval combat vessel that is often deployed in the East and South China Seas in a bid to demonstrate its naval power. It is widely believed that due to its resilience, it is likely to constitute an integral part of China's career strike group. The 134-meter-long frigate can harbor 165 sailors and has a four thousand tons displacement capacity.[10] It is equipped with a Chinese-origin H/PJ-26 main gun, CM-302 anti-ship missiles, vertical launch HQ-16, Type 730 Close in weapon system (CIWS), and triple torpedo launchers which bolster its air defense and anti-submarine warfare (ASUW) capability.

Type 054-A is pertinent to Pakistan's naval fleet's surface warfare capabilities. The frigates are equipped with a 32-cell H/AKJ-16 VLS. These VLS can host tube-launched torpedoes and air defense missiles. Due to its high rate of fire, modularity, and operational readiness, these systems

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7 Joseph Ataman, Frederik Pleitgen and Daria Tarasova-Markina, "A Ukrainian Pilot Outlines How Drones Powered By Jet Skis Sunk A Russian Warship," CNN, February 5, 2024, https://edition.cnn.com/2024/02/05/europe/

8 Gabriel Dominguez, "Pakistan Receives Five CH-4 Uavs From China," Janes, January 27, 2021, https://www.janes.com/defence-news/news-detail/

9 Usman Ansari, "Pakistan Launches First Locally Build Assault Boat," Defense News, December 13, 2022, https://www.defensenews.com/naval/2022/

10 Naval News, "Pakistan Navy Commissions New Type-054 A/P Frigate 'PNS Tughril'," January 24, 2022, https://www.navalnews.com/naval-news/2022/01/

harness greater efficiency than traditional SAM launchers in the existing surface fleet. Moreover, the vessels are also armed with LY-80N medium-range air defense missiles providing a cover of nearly 40 km. LY-80 has a commendable interception ratio, which can engage a variety of airborne threats, including missiles and aircraft. Furthermore, warships house SR-2410C 3-D functioning electronic scanned array radar, capable of tracking nearly 150 targets from a range of 250 km. The radar is resilient to any jamming or suppression methods and a robust addition to the navy's surface capabilities. In addition to this, Type 054-A are incrementally modulated to carry four CM-302 subsonic anti-ship missiles. These projectiles are expected to reach Mach 3 speed in the terminal phase by using ramjet propulsion. These long range, sea-skimming, and terminal dash weapons will augment Pakistan's Navy standoff strike capability with superior air defense penetration capabilities.

Pakistan has received a consignment of these frigates in the preceding years. The first Type 054-A (PNS Tughril) was commissioned on November 8, 2021.[11] The second ship, PNS Taimur, was inducted on June 23, 2022.[12] While the third and fourth ships PNS Tippu Sultan and PNS Shah Jahan were simultaneously inducted on May 10, 2023.[13] These ships are believed to be the frontline combatants of the Pakistan Navy in the face of any crisis or standoff in the Arabian Sea. Contrary to the previous Zulfiqar class frigate, the Type 054A class houses long-range surface-to-air missiles (SAMs). Hitherto, on the ASUW front, modern CM-302 missiles with a range of 290 km provide credible submarine hunting capabilities. Moreover, there seems to be no improvement regarding anti-surface warfare capabilities as it acquires the same systems as the PNS-Zulfiqar. However, the frigate is expected to replace the already obsolete *Tariq Class destroyers.*

The induction of these vessels will enhance the Pakistan Navy's surface warfare capabilities, consolidate its ability to secure the sea lines of communication and prevent attacks from potential adversaries. In the face of an adverse security environment in the IOR, Tughril class frigates augment Pakistan's naval capabilities to guard its littorals and maintain a credible foothold.

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11 Dorian Archus, "Pakistan Commissioned The First Type 054 A/P Frigate," Naval Post, November 9, 2021, https://navalpost.com/pakistan-commissioned-the-first-type-054/.

12 Tayfun Ozberk, "Pakistan Navy Commissions 2nd Type 054 A/P Frigate 'PNS Taimur'," Naval News, June 24, 2022, https://www.navalnews.com/naval-

13 Tayfun Ozberk, "Chinese Shipyard Delivers Final Two Type 054 A/P Frigates To Pakistan Navy," Naval News, May 11, 2023, https://www.navalnews.com/naval-news/2023/05/

PNS Babur

On September 6, 2024, the Pakistan Navy held an induction ceremony for its first MILGEM class corvette, PNS Babur (P-280), at the Karachi dockyard. President Asif Ali Zardari inaugurated the induction of a Corvette into the Pakistan Navy's fleet.[14] The corvette has been jointly developed by Karachi Shipyard and Engineering Works (KS&EW) and Istanbul Naval Shipyard (INSY) of Turkey. Babur class is considered a variant of the Ada-class corvette operated by the Turkish Navy. Unlike the Ada class, which is primarily developed for anti-submarine warfare (ASW), the Babur class can perform additional tasks of anti-air warfare (AAW) and anti-surface warfare (ASuW).

As a robust platform against air, surface, and subsurface threats, the Babur class has a length of 108.8 meters, a width of 14.8 meters, a draught of 4.05 meters, and a displacement of nearly 3000 tons. In addition, a combined diesel and gas (CODAG) arrangement attains two MTU 16V595 engines and a GE LM2500 gas turbine which thrusts the corvette to a speed of 31 knots. The ship can stay at sea for 15 days and operate for extended periods.

Babur-3 is equipped with six P-282 anti-ship cruise missiles, 12 Albatros NG surface-to-air missiles, Mark 32 324mm torpedoes, a Leonardo 76 mm rapid naval fire gun, and an Aselsan GOKDENIZ 35 mm close-in weapon system (CIWS) for point defense against incoming missiles and low-flying airborne threats. Two ASELSAN STOP 25mm autocannons are also fixated on remote weapon stations. Furthermore, the HIZIR decoy countermeasure system is installed to shield the ships from torpedo attacks.[15]

Due to the precarious geopolitical situation in the IOR, the Babur-class enhanced the Pakistan Navy's maritime position to counter traditional and non-traditional challenges. The induction of these corvettes will consolidate Pakistan's Potemkin naval fleet and enable it to meet the ever-increasing operational responsibilities.[16] Also, it will facilitate the Pakistan Navy's new posture of maintaining a sustained presence in the IOR.

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14 Tayfun Ozberk, "Pakistan Commissions PNS Babur Corvette and PNS Hunain OPV," Naval News, September 7, 2024, https://www.navalnews.com/naval-news/2024/09/

15 Baird Maritime, "VESSEL REVIEW | Babur – Pakistan Navy Corvette To Take On Air Defence And Surface Warfare Missions," July 15, 2024, https://www.bairdmaritime.com/security/naval/naval-ships/

16 Bilal Khan, "Pakistan Receives First Yarmook-Class Batch-II OPV (PNS Hunain)," Quwa, July 29, 2024, https://quwa.org/quwa-premium/

PNS Hunain

In line with the induction of Babur-class corvettes, the Pakistan Navy has inducted the first Yarmook-class Batch II offshore patrol vessel (OPV): PNS Hunain. The newly commissioned vessel is a multipurpose and agile platform of medium size tonnage. The ship is capable of undertaking tasks in electronic warfare, anti-air, and anti-ship warfare equipped with terminal phase defense systems. In addition, the ship can house a multirole helicopter can operate independently as a part of a Task Force, and can execute numerous missions while safeguarding the maritime interests of Pakistan.[17]

PNS Hunain is based on Damen's OPV-2600 design, which is more technologically capable than the already existing PNS Yarmook and PNS Tabook in Pakistan's naval fleet. The vessel is capable of boarding surface-to-air missiles from a vertical launch system (VLS), granting Pakistan Navy credible short to medium-range air defense capabilities. Similarly, Pakistan is expected to configure PNS Hunan with Anti-ship cruise missiles (ASCM), air and surface surveillance radar, a multirole helicopter, and electronic support measures suite. However, the prime role of PNS Hunain will revolve around supporting maritime policing, which includes anti-piracy, anti-smuggling, counter-insurgency, and counterterrorism operations. Moreover, PNS Hunain is also expected to perform the tasks of anti-submarine warfare, humanitarian and disaster relief (HADR), and minesweeping missions.

The vessel will augment the Pakistan Navy's operational capabilities, enhance forward presence, and consolidate its operational readiness in tandem with its deployment at Regional Maritime Security Protocols in the IOR. Similarly, it will allow the Pakistan Navy to transition from offensive sea denial toward a more concrete forward presence in the Arabian Sea and IOR in the face of a growing assertive and risk-tolerant India.

Undersea Capabilities

Historically, submarine forces remained a cornerstone in Pakistan's maritime calculations. In 1964, Pakistan purchased its first submarine, PNS Ghazi, from the US. This purchase was followed by new submarine additions to augment the undersea capabilities of the Pakistan Navy. Between 1969 and 70, Pakistan purchased an additional three Daphne-class submarines from France.[18] After losing PNS Ghazi to a tragic

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17 Associated Press of Pakistan, "Pakistan Navy Commissions 3rd offshore patrol vessel PNS HUNAIN in Romania," assessed on October 31, 2024, https://www.app.com.pk/national/

18 Pakistan Navy, "Submarine Force History," assessed on November 1, 2024, https://www.paknavy.gov.pk/submarine_history

accident during the Indo-Pak war in 1971, Pakistan procured a second-hand Daphne-class vessel from Portugal in 1975. Furthermore, two Agosta-70 class submarines were acquired to boost the ageing fleet. Pakistan procured three Agosta-90B boats from France Naval Group SA in 1994. These fleets constitute an integral part of Pakistan's Navy offensive sea denial strategy.

South Asia remains an active nuclear flashpoint, where nuclear-tipped projectiles in the inventories of both Pakistan and India pose a looming threat of a doomsday scenario. Hereby, submarine forces remain a lynchpin in Pakistan's nuclear posture to maintain its credible minimum deterrence. With five diesel-electric submarines and three mini-submarines, Pakistan needs to strengthen its undersea capabilities to respond to the evolving threat matrix in the region. The current fleet comprises two Agosta-70 boats and three modern Agosta-90B submarines of French origin. KS & EW constructed the indigenously third Agosta-90B PNS Hamza, commissioned in 2008. PNS Hamza attains French company Module d'Energie Sous-Marin Autonome (MESMA) air-independent propulsion AIP) system, making it the first submarine constructed in South Asia with an AIP system.

Initially, the Pakistan Navy had no intention of arming its submarines with nuclear arsenals. In 2003, the former chief of naval staff, Admiral Shahid Karimullah, stated that Pakistan had no intention of arming its submarines with nuclear-tipped missiles unless it was compelled by India to do so. However, in January 2017, soon after a month, India test-fired its Agni-V Intercontinental ballistic missile (ICBM); Pakistan successfully tested its first nuclear-capable submarine-launched cruise missile (SLCM), Babur-3. According to an analyst, Babur-3 is a testament to Pakistan's pursuance of a credible sea-based deterrent.[19]

Babur-3 is primarily a response to India's triad of air, land, and sea-based nuclear deterrents. According to Pakistan, Babur-3 will grant Pakistan a credible second-strike capability. The projectile is largely believed to be carried by the Agosta 90B submarine and has an estimated range of 450 km. In addition, technological advancements in the undersea capabilities worldwide have prompted the Pakistan Navy to improve its undersea capabilities. India's rapid advances in the ASUW capabilities underscore Pakistan's need to modernise its undersea arsenal. For this purpose, China is set to deliver the Type-039B Hangor II submarine by the end of 2024. According to Aaron Amick, Type-039B is an excellent conventional submarine despite all the reservations regarding the German-originated engines.

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[19] Ankit Panda, "Pakistan Conducts Second Test of Babur-3 Nuclear-Capable Submarine-Launched Cruise Missile," The Diplomat, April 1, 2018, https://thediplomat.com/2018/04/pakistan-

Including Type-039B is an intelligent decision by the Navy as it features a robust and low-cost addition to its inventory. Adding the indigenous weapons systems to this variant will make it more powerful. It is worth noting that these submarines can fire the Babur-3 nuclear-capable projectile to 280 miles. This combination of stealth and nuclear capability will help transform the tactical balance of power in its favour. Similarly, these submarines will help narrow down the force asymmetry visa Vis a technologically and numerically superior Indian navy.[20] Moreover, the Hangor-II will help Pakistan maintain an effective sea denial strategy in the face of tensions. Previously, Pakistan has tried to enhance its sea-based deterrent by inaugurating the Naval Strategic Forces Command Headquarters and unveiling a low-frequency communication facility for the submarines in 2012 and 2016, respectively.

As India is modernising its naval arsenals in the face of fraught geopolitics in the IOR, the induction of Hangor-II is a significant step in bolstering Pakistan's naval leg of second-strike capability. A more flexible, numerically feasible, and sustainable submarine fleet can serve as a credible deterrent in future crises. In this regard, the Hangoor-II is an essential addition to the existing naval fleet. Despite all the financial and fiscal constraints, the continuum of the naval program indicates that Pakistan is concerned about its role in the IOR. A force focused on an offensive sea denial strategy towards a force aiming to maintain a sustained presence in the IOR indicates the realisation of the changing maritime situation in the region. Pakistan's quest for a defense overhaul requires time because a weak navy is like a ship without sails.

Unmanned Platforms

The advent of unmanned aerial vehicles (UAV) has altered the calculus of modern warfare in all three domains: air, sea, and land. Pakistan Air Force remained prudent in incorporating UAVs into its fleet and raising drone battalions. Due to strategic necessity, the Pakistan Navy also follows suit by adding UAVs to its inventory. Currently, Pakistan is the fourth largest operator of UAVs, which underscores its anticipation of the unfolding of modern warfare. In 2011, the Pakistan Navy inducted its first fleet of reconnaissance drones: the Uqab series drone.[21] The UAV has been developed by the National Engineering and Scientific Commission (NESCOM) under the umbrella of the Strategic Planning Division (SPD). Even before the induction, the drones have been flown and tested across the Gwadar coast.

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20 Usman Ansari, "Pakistan and China Launch Joint Naval Drills. Should India Be Concerned," Defense News, last modified January 8, 2020, https://www.defensenews.com/digital-show-dailies

21 Salman Siddiqui, "Navy Inducts First Fleet Of Reconnaissance Drones," The Express Tribune, July 20, 2011.

These drones were force-multipliers and specifically designed for the mid-range tactical UAV. They could also be used for maritime interdiction operations in coastal areas. It can also be deployed to conduct surveillance on the naval ships operating adjacent to the areas of the Pakistani coast. Earlier to this, the Pakistan Navy also integrated the US ScanEagle UAV into its fleet in mid-2010. The UAV was equipped with catapult launch and retrieval via the SkyHook system and was integrated to fulfil the operational needs of the Pakistan Navy. Pakistan procures most of its UAVs from China, Turkey, Italy, and the US, which is complemented by its indigenous efforts to develop UAVs at NESCOM and Pakistan Aeronautical Complex (PAC) Kamra.

In addition, the Pakistan Navy accelerated its efforts to acquire armed drones for maritime purposes. Later, it was confirmed by the Chief of Naval Staff that the UAVs were CH-4Bs procured from Chinese partners. In September 2022, OSINT observers identified an additional Ground Control Station (GCS) at Turbat airbase, coupled with three ISO 40 ft. sized containers used for the UAV transportation as well as 20 ft. containers to hold spare parts of the UAV. Although OSINT didn't find any images of the UAV, a tender released by the Pakistan Navy to construct support facilities for CH-4 at Turbat confirmed the arrival of Chinese UAVs at Turbat airbase.[22] These drones are expected to be equipped with synthetic aperture radar (SAR) for maritime ISR, complementing the already present P-3C Orion's maritime patrol aircraft.

Furthermore, there are indications of interoperability between the Pakistan Navy and the Pakistan Army Aviation Corps. For instance, numerous army aviation Burraq UAVs were deployed alongside CH-4Bs at the Turbat airbase. Similarly, Pakistan's naval chief gave an interview to Turkish Defense where he revealed that the Pakistan Navy is seemly poised to acquire Bayraktar TB-2 drones, making it the second Pakistani operator of Bayraktar after PAF. TB-2 is likely acquired to replace the phased-out Uqab-II series.

Charting the Course: Towards a Secure Maritime Future

The geopolitical dynamics of the Indian Ocean are in continuous flux. The spillover of great power competition in the coastal Rimland of Eurasia necessitates the regional powers to calibrate their regional policies accordingly. Being in the US-backed Quadrilateral Security Cooperation, India is now realigning its maritime prowess to make itself a counterweight to China. India's longstanding aim to achieve 'three dominances' in South Asia has rejuvenated its maritime strategic vision, which isevident in its maritime doctrines, military modernisation program, and assertive posture of the Indian Navy in the Indian Ocean.

[22] Farooq B, "Updates to Pakistan's Drone Fleet," Quwa, Januaray 13, 2023, https://quwa.org/daily-news/updates-to-pakistans-drone-fleet/.

This transformed regional calculus is mainly aimed at the security of the sea lines of communication (SLOC) and deterring the nuclear neighbours, particularly Pakistan and China.

This precarious security situation has raised eyebrows in Pakistan, whose strategic culture is influenced by three factors: etched hostility with India, the perceived threat of a two-front war with Afghanistan and India, and the perception of a lack of strategic depth due to its population concentration and infrastructure along the Indus River.[23] These factors have made Pakistan averse to Indian designs thereby prioritising defense, forging, and seeking military alliances. Moreover, the Indian navy's aggressive buildup raises the risk of an arms race between the regional rivals.[24]

Due to the perception of a lack of strategic depth, Pakistan's overall force posture has been focused on deterrence by denial. A similar doctrinal mindset persists in the Pakistan Navy, too, where the development of its sea-based nuclear deterrent is aimed at countering evolving India's naval program.[25] In 2012, Pakistan established its naval strategic command at its naval headquarters. Even before this, senior officials from the Pakistan Navy claimed to have the ability to deploy nuclear weapons at sea. In 2017, Pakistan test-fired its Babur-3 SLCM. However, the ambiguity around credible second strike capability persists because Babur-3 is incapable of long-range counter-value targeting.

With a relatively smaller fleet, Pakistan's ability to respond to Indian aggression are limited. Nonetheless, Pakistan's maritime posture looks similar to a proactive maritime actor in the IOR.[26] This is evident through the sighting of Indian submarine which was subsequently foiled by Pakistan navy from entering the coastal waters. In this regard, Pakistan's naval buildup is centered on defending itself from any possible incursion by Indian navy which is increasingly assertive due to its burgeoning maritime capabilities. In past, Pakistan neglected the maritime domain on economic and military fronts.[27] However, the current

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23 Hasan-Askari Rizvi, "Pakistan's Strategic Culture," in South Asia in 2020: Future Strategic Balances and Alliances, (2002): 305-328, https://www.jstor.org/stable/resrep12079.14.

24 Walter C. Ladwig III, "Drivers of Indian Navy Naval Expansion," in Harsh V. Pant (ed.), *The Rise of the Indian Navy: Internal Vulnerabilities, External Challenges* (London: Routledge, 2012): 19-40.

25 Khuram Iqbal etal., "Major Power Competition In The Indian Ocean And Doctrinal Development In Pakistan," *Comparative Strategy* 42, no. 4 (2023): 509-527.

26 Ghazala Yasmin Jalil, "India's Development of Sea-based Nuclear Capabilities: Implications for Pakistan," *Strategic Studies* 38 (1), 34-37.

27 Sajid Mehmood Shahzad and Aleem Gillani, "Maritime Security: A Case Study of Pakistan," *Journal of Nautical Eye and Strategic Studies* 2, no 1 (2022): 25-32.

modernisation program is aimed to strike balance with Indian navy and maintain a favorable balance of power in Arabian Sea and IOR.

The strategic environment in the Indian Ocean has rapidly transformed in the past decade. One formed to combat non-traditional challenges and conduct disaster relief, QUAD has now transformed into a full-fledged platform of military exercises between the US, India, Australia, and Japan. Similarly, signing the Basic Exchange and Cooperation Agreement (BECA) and procuring P8I Poseidon maritime patrolling aircraft has brought India into a dominant position in the IOR. Furthermore, the US has deployed its nuclear ballistic missile submarine at Diego Garcia, an isolated base in the IOR. Along with this, the controversy surrounding the AUKUS deal has sparked the debate about the potential nuclearisation of the Indian Ocean, which complicates the regional security dynamics.

On the other hand, China has emerged as a pacing challenge to the Euro-Atlantic order. With its burgeoning energy and economic appetite, its interest in the IOR has increased manifold. Though chiefly commercial, docking of Chinese naval ships at Djibouti and growing commercial footprint in Gwadar and Hambantota ports is a harbinger to increasing Chinese naval presence in the future.

Pakistan's naval modernisation is powered by a strategic necessity to secure its coastal line. Historically, the Pakistan Navy remained a significant actor in the Combined Maritime Forces (CMF) to oversee the security of the Western Indian Ocean. Pakistan Navy also commanded CMF's Combined Maritime Taskforces 150 (maritime security) and 151(counter-piracy). However, Pakistan's growing relations with China have posed a tougher choice of navigating the geopolitical waters in the IOR. This is evident through the securitisation of the maritime domain due to growing Sino-Pakistan cooperation under the umbrella of the China-Pakistan Economic Corridor (CPEC).[28]

On the other hand, Indian Navy is capitalising its geopolitical alignment with the US by continuously striving for the uncontested dominance in the IOR. Despite competitive deficiencies in operational readiness and capabilities, it is believed that Indian Navy will be capable of power projection in Strait of Hormuz and Malacca Straits.[29] In this regard, India's nuclear submarines and aircraft carriers will provide a robust bastion to guard its littorals. These enlargements particularly the development of a nuclear-powered submarine INS Arihant presents a convincing case for the Pakistan Navy to develop a nuclear missile

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28 Khuram Iqbal etal., Securitization of the Maritime Sector In Pakistan," *Comparative Strategy* 43, no 6 (2024): 734-748.

29 Syed Qandil Abbas and Umme-Habiba, "Maritime Power Play in the Indian Ocean and Challenges for Pakistan Navy," *NUML Journal of Research in Social Sciences* 11, no 1 (2023): 19.

submarine. Muhammad Azam Khan, the author of Pakistan's maritime doctrine, also believes that the INS Arihant has been active in the close and adjacent waters of Pakistan's coast for information gathering and reconnaissance purposes.[30] Although futile—as nuclear missile submarines are rarely used for tactical-level tasks such as intelligence and information gathering—it allows the Pakistan Navy to actively advocate for the sea-based deterrent or a second strike capability. Pakistan navy watchers also believe that the navy is ready and capable of fielding a sea-based nuclear weapon to enhance its strategic force posture in the Arabian Sea and the IOR. The acquisition of sea-based deterrents will also grant the Pakistan Navy greater leverage in the strategic corridors of visa Vis Pakistan Army, which has dominated the security establishment.

Hitherto, the integration of new platforms, particularly surface warfare, undersea warfare, and unmanned agents, reflects the Pakistan Navy's aspiration to maintain a strong foothold in the IOR. The Pakistan Navy's modernisation is a concrete effort to transform itself from a green-water navy to a more coherent and robust regional role.

Although Pakistan is interested in novel and modern naval technologies, India still maintains an edge due to its technical and numerical superiority, which is also majorly due to ease of access to Western and Russian technology, whilst the Pakistani military has intermittently faced sanctions and restrictions. The Arabian Sea drill is the largest demonstration of Indian operational capabilities in the IOR. The exercise included two aircraft carriers, numerous warships, and submarines coupled with thirty-five frontline planes in the wake of the heating dynamics of the region. The exercise represents the Indian ambition of having heightened maritime security and power projection capabilities in the IOR. While Pakistan's naval capabilities are discussed in New Delhi's policy circles, they are significantly eluded despite Pakistan's efforts to overhaul its existing fleet.[31] The mega exercise in the Arabian Sea is a reality check for Pakistan due to India's demonstration of the smooth integration of two aircraft carriers coupled with Mig-29K aircraft and MH-60R helicopters. Likewise, the synergising of the flotilla of frigates, submarines, and ships demonstrates India's improved network-centric warfare capabilities.

The drill also enabled India to station its carriers flexibly in the IOR and beyond. It enabled India to maneuver flexibly, maintain intra-operability, and maintain a sustained presence of sea-based airpower in

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30 Muhammad Azam Khan, "The Developing 'Strategic Depth' And 'Full Spectrum Deterrence'," The News, December 3, 2016, https://www.thenews.com.pk/print/169366-.

31 Aditya Bhan, "Project-751 Submarine Acquisition: Should the Indian Navy relax Air-Independent Propulsion Requirement," Observer Research Foundation, August 30, 2022, https://www.orfonline.org/expert-speak/ /?.

the wake of any conflict. On the other hand, Pakistan's modernisation of its naval fleet is significant. However, it is not sufficient to credibly challenge the Indian Navy's control of the high seas.

Overall, Pakistan's navy will remain a defensive force and will likely continue this course shortly. Following the current trend, Pakistan's focus on preserving its maritime interests, combating piracy, providing disaster relief, and contributing its efforts to maintain a peaceful naval order will prompt it to enhance its anti-access/area denial capabilities. It will deny the adversary's capabilities to operate freely in the Arabian Sea and the IOR. However, the gradual increase in the existing capabilities will pose challenges to the Indian Navy and will help it to sustain its foothold in the IOR.[32]

Understanding Pakistan's naval modernisation requires a careful consideration of the significance of sea power.[33] Given India's increased power projection capabilities, sustaining maritime presence and maintenance of sea-based air power through carriers have caused alarm in policy circles. The recent Arabian drill demonstrated the heightened Indian power projection capabilities and flexible interoperability in the IOR. In this regard, Pakistan needs to enhance its existing A2/AD capability as it remains largely a defensive force. In the wake of the current maritime doctrine, Pakistan is focused on maintaining a sustained presence in the IOR; this will affect the current naval dynamics in the region as the force aiming to maintain an offensive denial strategy is now focused on a sustained presence in the IOR. It will primarily affect the maritime equations in the future.

Recommendations

Considering the dynamics of the IOR, the study suggests a few recommendations for the Pakistan Navy in the IOR.

Scrutinising Existing Doctrines

A famous naval pundit stated that *doctrine is the soul of warfare.*[34] Against this backdrop, Pakistan needs to scrutinise its existing maritime doctrine and operational concepts where the possibility of deterrence failure should be given precedence. In this regard, both states need to sign

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32 Aditya Bhan, "The Indian Navy's Arabian Sea Exercise is a reality check for Pakistan," Observer Research Foundation, July 24,2023, https://www-orfonline-org.cdn.ampproject.org/c/s/www.orfonline.org/

33 Alfred Thayer Mahan, *The Influence of Sea Power Upon History,* (Boston: Little Brown and Company, 1890), https://archive.org/details/seanpowerinf00maha.

34 Julien Corbett, 'Staff Histories', In Naval And Military Essays (Cambridge: Cambridge University Press, 1914), 24.

confidence-building measures and encourage cooperation on inadvertent and accidental breaches of the territorial waters.

Joint Forces Synergy

Due to limited financial resources, the Pakistan Navy needs to augment its capabilities by increasing its intra-operability and collaboration with the Pakistan Air Force and Pakistan Army Aviation to monitor the sea lanes, conduct reconnaissance operations, and provide necessary air cover in case of conflict. This would include more joint exercises that train personnel in inter-branch coordination and standardisation in handling contingencies. This not only enhances wartime operational readiness but also induces flexibility for peace operations in which Pakistani military branches often participate, such as floods, earthquakes, sea disasters, and humanitarian operations.

Investing in Airborne Early Warning and Control (AWEC) Systems

Pakistan is currently focusing on its existing submarine and surface water fleet. Nonetheless, it must focus on updating its AWEC systems to facilitate airborne early warning and control. It includes integrating new platforms and utilising UAVs to enhance situational awareness in the IOR. Doing so will help generate early warning for naval assets in the wake of suspicious moves in territorial waters. In addition, unmanned maritime surveillance systems would need to be integrated, first as an augmenting element to existing Maritime patrolling aircraft and eventually becoming a lynchpin of maritime surveillance, command, and monitoring platforms. Such drones can fly for longer durations and monitor wider areas with their sensor technologies, especially in Signals and Electronic intelligence collection (ELINT and SIGINT). Chinese systems like the BZK-005 and modernised Wing Loong Series drones can be versatile platforms that can be used for maritime monitoring as well as sea denial capabilities through their armed variants.

Including Unmanned Sea Vehicles as Mainstay Naval Assets

The Russia-Ukraine war has transformed into a testing ground for modern warfare technologies, with unmanned systems at the forefront. Ukraine's strategic deployment of sea drones has emerged as a significant factor in challenging Russian naval supremacy in the Black Sea. Sea drones like the Sea Baby and Magura V5 have been instrumental in targeting and

damaging Russian vessels, compelling the Russian Navy to reconsider its deployment strategies in the Black Sea.[35]

Developing Sea-based drones and eventually drone swarms can circumvent the need for larger, more expensive vessels, which also bring with them higher maintenance costs. Since Pakistan's Naval operations would mostly be conducted in a 500 to 1500 km radius, these drones can be decisive and formidable challenges to adversaries' assets. Ranges can even be extended if these assets are launched from a naval mothership outside littoral waters.

Public-Private Partnership

Pakistan needs to emphasise more on the public-private partnership and reduce the military stranglehold on the defense industry. Including the private sector will contribute to capacity building and cost-effectiveness. It will also enhance Pakistan's indigenous capabilities to develop more local systems, which will help to save the dollars drained on importing sophisticated systems from external sources. Examples from PAF's initiative of National Aerospace and Technology Park (NASTP) are worth mentioning. Such initiatives in the maritime domain will be a step towards self-reliance and a decrease in dependence on external sources.

Conclusion

Pakistan's naval modernisation is a testament to its ambition to become an influential navy in the IOR amidst great power competition. As regional geopolitical competition veers to the sea, echoes of Mahan's ethos are being heard in the maritime corridors. The entry of great powers coupled with India's aspirations, particularly through the development of submarines, fundamentally threatens Pakistan's maritime security and strategic stability. It also undermines Pakistan's claimed full spectrum deterrence (FSD). Having a hostile government in the east, Pakistan needs to consolidate its maritime strength to keep pace with the changing regional dynamics.

Traditionally, Pakistan has been fixated on land warfare; however, being glued to this assumption will potentially threaten Pakistan's national security. Without having a credible second-strike capability, Pakistan's nuclear posture remains incomplete. Currently, Pakistan's AIP submarines aren't capable of targeting distant targets in the east, which means that India's counterforce targets at Vishakhapatnam remain unthreatened in the case of conflict. Therefore, Pakistan needs to take cues from the

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35 Malsin, Jared. "Ukraine's Sea Drones Alter Balance of Power in Black Sea." Wall Street Journal, August 11, 2023, sec. World. https://www.wsj.com/articles/ ukraines-sea-drones-alter-balance-of-power-in-black-sea-391cebee.

changing geopolitical equations and chart its maritime course to secure its interests shortly.