ISSUEBRIEF

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# MODERNISATION OF INDIAN NUCLEAR TRIAD AND DEVELOPMENT OF SSBNS: REGIONAL IMPLICATIONS

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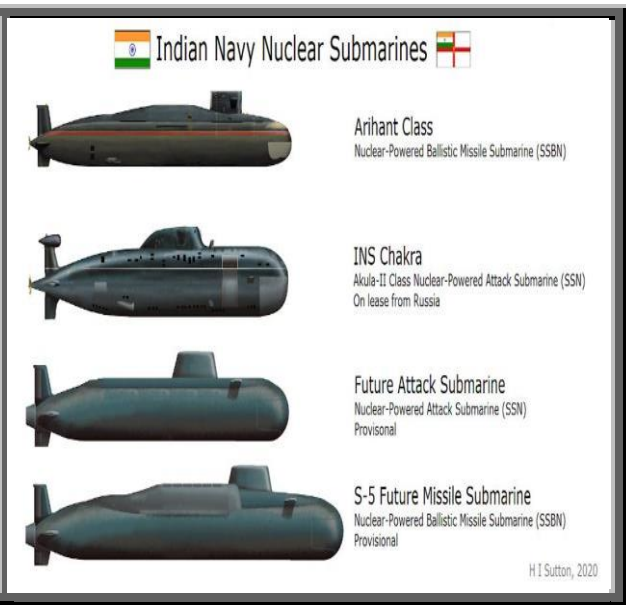
***(Views expressed in the brief are those of the author, and do not represent those of ISSI)***




**India was the first state in the South Asian region to acquire nuclear weapons. In November 2018, as declared by the Indian Prime Minister Narendra Modi, India also became the first in the region to complete the nuclear triad which consists of land launched nuclear missiles, strategic aircraft capable of carrying nuclear missiles and submarines armed with nuclear missiles.[1] India's three-sided nuclear force structure is based on "*Prithvi* short-range ballistic missiles and various versions of the *Agni* intermediate-range ballistic missile manned by the missile groups of the Indian Army; nuclear glide bombs carried on aircraft of the Indian Air Force (IAF) and, eventually, submarine-launched ballistic missiles (SLBMs) deployed on ballistic missile submarines (SSBNs) with the Indian Navy."[2] The indigenous development of the nuclear powered ballistic missile submarine, INS *Arihant*, placed India in the league of the five great powers that can build and operate SSBNs.[3] This advancement put pressure on regional states as nuclear-armed**

1 Adam Augustyn, "Nuclear Triad Military Strategy," the Editors of Encyclopedia Britannica, July 29, 2021, https://www.britannica.com/topic/nuclear-triad

2 Gurmeet Kanwal, "India's Nuclear Force Structure 2021," Carnegie Endowment for International Peace, August 6, 2021, https://carnegieendowment.org/2016/06/30/india-s-nuclear-force-structure-2025-pub-63988

3 "India's Nuclear Triad is Complete with INS Arihant ending its First Deterrence Patrol," *The Hindu*, July 29, 2021, https://www.thehindu.com/news/national/ins-arihant-completes-deterrence-patrol-india-declares-nuclear-traid-operational/article25425436.ece

**submarines not only assure second-strike capability but unlike land and air-based nuclear weapon systems, are also impossible to detect.**

India is now keen to expand its nuclear presence in the Indian Ocean. In April 2020, the Indian Navy expressed its willingness to acquire six nuclear submarines instead of an aircraft carrier. According to Ayush Jain, a defence journalist, "INS *Arighat*, Indian Navy's new ballistic missile submarine which is the second in the Arihant-class SSBN, is expected to join the service this year."[4] As of July 2021, the Indian Navy currently consists of one SSBN and fifteen diesel-electric attack submarines, most of which have recently undergone or are currently scheduled for mid-life refit, while one *Akula* class SSN, *Chakra 2* has recently been returned to Russia (see table below).[5]

**India Navy Submarine Capabilities**

| No. | Name / Number | Class | Type | Displacement | Commissioned |
|---|---|---|---|---|---|
| 1 | Sindhugosh S 55 | Sindhughosh | Attack Submarine – Diesel Electric | 3000 tonnes | 1986 |
| 2 | Sindhudhvaj S 56 | Sindhughosh | Attack Submarine – Diesel Electric | 3000 tonnes | 1987 |
| 3 | Sindhuraj S 57 | Sindhughosh | Attack Submarine – Diesel Electric | 3000 tonnes | 1987 |
| 4 | Sindhuratna S 59 | Sindhughosh | Attack Submarine – Diesel Electric | 3000 tonnes | 1988 |
| 5 | Sindhukesari S 60 | Sindhughosh | Attack Submarine – Diesel Electric | 3000 tonnes | 1989 |
| 6 | Sindhukirti S 61 | Sindhughosh | Attack Submarine – Diesel Electric | 3000 tonnes | 1990 |
| 7 | Sindhuvijay S 62 | Sindhughosh | Attack Submarine – Diesel Electric | 3000 tonnes | 1991 |
| 8 | Sindhurashtra S 65 | Sindhughosh | Attack Submarine – Diesel Electric | 3000 tonnes | 2000 |
| 9 | Shishumar S 44 | Shishumar | Attack Submarine – Diesel Electric | 1850 tonnes | 1986 |
| 10 | Shankush S 45 | Shishumar | Attack Submarine – Diesel Electric | 1850 tonnes | 1986 |
| 11 | Shalki S 46 | Shishumar | Attack Submarine – Diesel Electric | 1850 tonnes | 1992 |
| 12 | Shankul S 47 | Shishumar | Attack Submarine – Diesel Electric | 1850 tonnes | 1994 |
| 13 | Chakra 2 S 71 | Akula | Attack Submarine – Nuclear powered | 8140 tonnes | 2012 Returned to Russia in 2021 |
| 14 | Arihant S 2 | Arihant | Nuclear SSBN | 6000 tonnes | 2016 |

[4] Ayush Jain, "US Expert Calls India's 'Mysterious' Ballistic Missile Submarine a Formidable Deterrent to Regional Opponents," *The Eurasian Times*, July 29, 2021, https://eurasiantimes.com/us-expert-calls-indias-mysterious-ballistic-missile-submarine-a-formidable-deterrent-to-regional-opponents/

[5] Amrita Ghaswalla, " Six Indian Navy Submarines to be Upgraded," *The Hindu Business Line,* August 6, 2021, https://www.thehindubusinessline.com/news/six-indian-navy-submarines-to-be-upgraded/article22681899.ece#comments

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|---|---|---|---|---|---|
| 15 | Kalvari S 21 | Kalvari | Attack Submarine – Diesel Electric | 1775 tonnes | 2017 |
| 16 | Khanderi S 22 | Kalvari | Attack Submarine – Diesel Electric | 1775 tonnes | 2019 |
| 17 | Karanj S 23 | Kalvari | Attack Submarine – Diesel Electric | 1775 tonnes | 2021 |
| 18 | Vela S 24 | Kalvari | Attack Submarine – Diesel Electric | 1775 tonnes | 2021 (Expected) |
| 19 | Vagir S 25 | Kalvari | Attack Submarine – Diesel Electric | 1775 tonnes | 2022 (Expected) |
| 20 | Arighat S 3 | Arihant | Nuclear SSBN | 6000 tonnes | 2021 (Expected) under sea trials |
| 21 | Chakra 3 | Akula | Nuclear powered Attack Submarine | 12,775 tonnes | 2025 (Expected) Russia-India Deal 2019 |
| 22 | Codename S 4 | Arihant | Nuclear Powered Ballistic Missile | 7000 tonnes | 2023(Expected) Delayed due to Covid 19 |
| 23 | Codename S 4* | Arihant | Nuclear Powered Ballistic Missile | 7000 tonnes | Under Construction |
| 24 | Codename S 5 | S5 | Nuclear Powered Ballistic Missile | 13,500 tonnes | 3 Planned Production likely to start in 2022 |

**Source:** Data is compiled from different open sources, for further details see, "Submarines Active," National Informatics Centre, August 6, 2021, https://www.indiannavy.nic.in/content/submarines-active, "India Submarine Capabilities," Nuclear Threat Initiative, July 29, 2021, https://www.nti.org/analysis/articles/india-submarine-capabilities/, "From *India Today* magazine: A peek into India's Top-secret and Costliest Defence Project, Nuclear Submarines," *India Today*, December 10, 2017, https://www.indiatoday.in/magazine/the-big-story/story/20171218-india-ballistic-missile-submarine-k-6-submarine-launched-drdo-1102085-2017-12-10

The INS *Arihant* is capable of carrying 12 *Sagarika* (K-15) SLBM, which has a range of 700km. In January 2018, after a crewmember of INS *Arihant* left one of its hatches improperly secured, the propulsion system flooded and left the INS inoperative for ten months until November 2018 when it finally completed its first deterrent patrol and booted up India's third leg of the nuclear triad. The INS *Arighat* that is expected to be launched this year is predicted to be even more lethal than the INS *Arihant* as it may carry either 24 *Sagarika* (K-15) SLBMs that have a range of 750 km or 8 K-4 SLBMs which have a range of 3500km.[6] Moreover, it even can carry assembled nuclear weapons that are available to launch at any time making it an even dangerous variant of the *Arihant* series.

With the ever-changing global security situation, India realises the importance of upgrading its nuclear triad to ensure its status as a major power in the region. In the pursuit of modernising its nuclear weapon delivery systems, India is reportedly developing "Hypersonic Cruise Missile BrahMos-II which will have Mach 7 hypersonic speed, undermining the existing strategic

[6] Rakesh Krishnan Simha "Why INS Arihant gives India an Edge Against its Neighbours," *Business Today*, July 30, 2021, https://www.businesstoday.in/latest/story/why-ins-arihant-gives-india-an-edge-against-its-neighbours-111337-2018-11-20

 

equilibrium."[7] Moreover being the largest importer of armaments in the world, India has also acquired nuclear-capable Rafale fighter jets from France.[8] India is bordered by two nuclear-armed states, China and Pakistan and is in a territorial dispute with both these states. Therefore, to attain a major power status in the region, India has been spending massively on the modernisation of its conventional and nuclear arsenals at a time when the world was hit by the worst pandemic in history and the situation in India was the most dreadful out of all the Asian states.[9]

Previously, the Indo-Pakistan deterrence relationship was the most significant one in the region; however, with the modernisation of its nuclear arsenals, the emphasis on the Sino-Indian strategic relationship has increased.[10] Both China and Pakistan are now in the range of Indian ballistic missiles such as the newly developed and advanced variants of the Agni series. In 2020, twenty Indian soldiers were killed during a clash with the Chinese troops over the historically disputed Himalayan border area.[11] A deadly incident was witnessed in the area after almost forty decades thus it paved the way for new threats and concerns for the region. India feels the need to balance its naval assets with China as with the rise of the Chinese Navy, it now faces a powerful maritime threat. The Chinese *Jin-class* SSBNs and *Shang-Class* SSNs can remain in the ocean for a longer period, unlike India's French-designed *Scorpene*-Class Submarines.

However, with assistance from Russia, the Indian nuclear triad and deterrence capabilities can grow rapidly, intensifying Pakistan's security dilemma. In March 2019, Russia and India signed a deal to lease another *Akula*-Class submarine to India called *Chakra* 3 for 10 years, which will be delivered in 2025. This will consequently escalate the arms race not only in the region but also globally. The arms race in the ocean will not only disturb the deterrence equation and the strategic stability of the region but also stir up the insecurities and misperceptions, the two neighbours have had regarding each other for the last seven decades. Even accidents and miscalculations in the sea can lead to a deadly clash between the two.

For Pakistan, an arms race is not viable in the current economic situation, however, to counter India's maritime threat, Pakistan will surely develop SSBNs in the future, meanwhile, a submarine-

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7 Rabia Javed, "Hypersonics in South Asia," *The Nation,* August 6, 2021, https://nation.com.pk/19-Apr-2021/hypersonics-in-south-asia

8 Jyoti Malhotra, "India favoured Rafale also because of its 'nuclear advantage," *The Print,* August 6, 2021, https://theprint.in/defence/india-favoured-rafale-also-because-of-its-nuclear-advantage/193103/

9 "Complicit: Nuclear Weapons Spending increased by $1.4 billion in 2020," International Campaign to Abolish Nuclear Weapons, July 30, 2021, https://www.icanw.org/complicit_nuclear_weapons_spending_increased_by_1_4_billion_in_2020

10 Kristensen and Korda "Indian nuclear forces, 2020."

11 "India-China Clash: 20 Indian Troops Killed in Ladakh Fighting," *BBC*, July 30, 2021, https://www.bbc.com/news/world-asia-53061476

 

launched cruise missile, *Babur 3*, Pakistan's current sea-based deterrent, somewhat stabilises its deterrence relationship with India. Moreover, India has one of the largest naval fleets in the world and because of a stable economy and a large defence budget; it is continuously working on upgrading its nuclear arsenals and acquiring modern technologies, which Pakistan, with a smaller budget cannot acquire instantly which could give India a great advantage in the times of conflict or war.

Additionally, the Indian dominance in the ocean means that the trade routes of all the littoral states including Pakistan may be affected and they may even be denied access to its resources. China's string of pearls policy is something that the smaller powers look up to for deterring the Indian naval forces. The string of pearls refers to the network of the Chinese military and commercial bases and ports in different states of the region and neither India nor China's competitors like the US and Russia are in the favor of this policy.

With the nuclearisation of the Indian Ocean, India not only risked the existing fragile nature of deterrence in South Asia but also directly challenged China, making the region increasingly hostile. The aim of becoming a regional and global power is motivating India to build a formidable naval force to tackle threats and deter states in the Indian Ocean region, especially to counterbalance China's growing power with the help of the US and its allies. The involvement of the great powers makes this region more significant as well as vulnerable to an ever-growing threat of a nuclear war. The vertical proliferation of the Indian nuclear arsenals is not even being questioned by the supporters of nuclear nonproliferation, which also exposes the intentions of the great powers to develop the naval assets of India for their interests such as to balance the rising influence of China in the region.

The growing adversarial relations between China and the West have a huge impact on the nature of the Sino-Indian relationship, which means that nuclear modernisation will continue in the future as well. China is currently prioritising the security of its maritime silk road as it is one of the most significant trade routes in the world and India needs to assure its strong presence in its home waters to tackle any situation involving China which according to a 2020 pentagon report has ships that are "largely composed of modern multi-role platforms featuring advanced anti-ship, anti-air and anti-submarine weapons and sensors."[12]

[12] Benjamin Brimelow, "A Year after a Showdown on 'the roof of the world,' India is gearing up to take on China at sea," *Insider*, August 2, 2021, https://www.businessinsider.com/after-himalayan-clash-india-prepares-navy-to-take-on-china-2021-6

 

With a fluctuating global security environment, having a strong land, air and naval force is the need of the hour, especially for Pakistan, as with a small budget it cannot afford the latest technologies and large fleets but even a minimal naval force capability is enough to ensure the credibility of its nuclear deterrent, thus it needs to acquire deterrents that may be limited in number but reliable. Moreover, as India is acquiring SSBNs, it will also require fissile material such as highly enriched Uranium and Plutonium and will increase its number of warheads soon. Thus, Pakistan immediately needs to raise its voice against this vertical proliferation of nuclear weapons by India at all the international forums as diplomatic pressure may result in the discontinuation of its ever-increasing nuclear forces in the ocean. As far as the strategic stability of South Asia is concerned, even with the assurance of second-strike capability, the Indian pursuit of hegemony and Pakistan's increasing security dilemma will further accelerate the arms race between the two, paving the way for new security challenges in the region.