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Cover Photographs:

INS Nilgiri, the First of the Project 17A Stealth Frigates, being launched at Mumbai on September 28, 2019. Source: PIB

INS Kursura, commissioned at Riga in 1979. Source: Indian Navy

INS Chakra at Sea. Source: Wikimedia Commons.

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Whither India's Submarines
By
Lalit Kapur

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Whither India’s Submarines

by

Lalit Kapur

Introduction

“Navy seeks amendment to 30-year plan, wants six nuclear boats”, announced a headline last week1. Over six years ago, another headline2 had said, “Govt. approves construction of 7 stealth frigates, 6 nuclear-powered submarines”. The accompanying report informed readers that the Cabinet Committee on Security (CCS) had cleared the indigenous construction of seven stealth frigates under the Rs 50,000 crore Project 17A, as well as six nuclear-powered attack submarines. But if the Government had already approved the indigenous construction of six nuclear boats (SSNs) in 2015, why did the Navy still “want” them last week?


The reality is that as of today, construction of the stealth frigates announced in 2015 is well underway. Construction of the SSNs, however, is still in the Navy’s wish-list, notwithstanding reports regarding government approval for them surfacing in the mainstream media at regular intervals.

Submarines captured the imagination of security planners during the Battle of the Atlantic, when the German U-boat campaign raised the spectre of defeat for the allies. At the same time in the Pacific, American submarines successfully cut Japan’s oceanic lifelines. Three warships have been lost to them after WWII: INS Khukri sunk by PNS Hangor on December 9, 1971; the Argentine cruiser General Belgrano by HMS Conqueror off the Falklands on May 2, 1982, and the South Korean corvette ROKS Cheonan by a North Korean midget submarine on March 26, 2010. Notwithstanding this limited record, submarines have become an indispensable offensive tool for maritime powers. 42 countries, including 18 in the Indo-Pacific, currently operate them for military purposes. Military submarines are broadly classified under two types based on the mission assigned to them. First are those dedicated to the retaliatory nuclear strike. The preserve of nuclear weapon powers, their mission necessitates that they remain hidden in secure areas until it is time for them to use their SLBM. They cannot be risked for war fighting, though they do possess the necessary sensors and weapons. With one exception, they are invariably nuclear-propelled and use ballistic missiles as their primary weapon. They are designated as SSBNs.

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5 MDL Mumbai launched the lead ship of the class in September 2019, while GRSE Kolkata launched the second in December 2020, both ships are expected to commission by 2023.


6 Submarine Launched Ballistic Missile

7 Pakistan is the only country to claim having adopted conventional submarines for deterrent purposes, using nuclear tipped cruise missiles.

8 Ship, Submersible, Ballistic Missile, Nuclear
### Table 1: Submarines Operated by Nuclear Submarine Operators

<table>
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<tr>
<th>Country</th>
<th>Submarine Classes in Service</th>
<th>Remarks</th>
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<tbody>
<tr>
<td></td>
<td>For Deterrence</td>
<td>For Warfighting</td>
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<tr>
<td></td>
<td>SSBN</td>
<td>SSGN/SSN</td>
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<tr>
<td>China</td>
<td>Xia</td>
<td>Han</td>
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<td></td>
<td>Jin</td>
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<tr>
<td>France</td>
<td>Triomphant</td>
<td>Barracuda</td>
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<tr>
<td></td>
<td></td>
<td>Rubis</td>
</tr>
<tr>
<td>India</td>
<td>Arihant</td>
<td>Chakra</td>
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<td></td>
<td>S5</td>
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<td></td>
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<tr>
<td>Russia</td>
<td>Borey</td>
<td>Yasen</td>
</tr>
<tr>
<td></td>
<td>Delta IV</td>
<td>Oscar II</td>
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<tr>
<td></td>
<td>Delta III</td>
<td>Akula</td>
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<td></td>
<td>Typhoon</td>
<td>Viktor III</td>
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<tr>
<td></td>
<td></td>
<td>Sierra II</td>
</tr>
<tr>
<td>UK</td>
<td>Vanguard</td>
<td>Astute</td>
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<tr>
<td>USA</td>
<td>Ohio</td>
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<td></td>
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<td>Seawolf</td>
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<td>Los Angeles</td>
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<tr>
<td>Brazil</td>
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The second broad type is attack submarines, intended for war fighting. Attack submarines may also be divided into two broad types based on their propulsion. The more used variety is diesel-electric submarines, designated as SSKs. The rarer variety is nuclear propelled attack submarines (SSNs). Nuclear

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9 Compiled by author from public sources.
boats are, therefore used for both deterrent and attack missions. A list of nuclear submarine operators is at Table 1 above.

**India’s Submarine Programme**

India has a force of 15 SSKs (four Shishumar Class, 8 Sindhughosh Class and three Kalvari class), one SSN (INS Chakra, leased from Russia) and one SSBN. One SSBN is undergoing sea trials and is expected to be commissioned this year; two more are under construction. Construction of three more SSKs is expected to be completed by 2022.

India’s submarine programme has a chequered history. Acquisition of four submarines by the Indian Navy (IN) was proposed within weeks of independence\(^\text{10}\). However, the Navy’s leadership of that time was British and believed operation of submarines was beyond the capability of Indians. It wanted them to be manned and operated by RN personnel. This was politically unacceptable.

When the first Indian Chief of Naval Staff took over in 1958, his proposal for acquisition of submarines was rejected on the grounds that acquiring offensive platforms would not be in consonance with the national policy of non-violence, non-interference in the affairs of others and lack of interest in the area outside national territory. China, meanwhile, acquired submarines from

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the USSR in 1953 and began building the Whiskey class under licence at the Jiangnan Shipyard in 1956. It took reports of Chinese submarines operating in the Bay of Bengal in 1962 as well as Pakistan acquiring PNS Ghazi (ex USS Diablo) in 1963 for the Indian government to finally approve the acquisition of submarines. After pursuing the US and UK (and being rebuffed), India turned to the USSR. The first submarine to fly India’s flag was commissioned at Riga on December 08, 1967.

In 1977, the government approved diversification of sources and the acquisition of SSKs from HDW of Germany. The first two were delivered by 1986. Two more were constructed by MDL Mumbai and entered service in 1992 and 1994 respectively. An option clause for construction of two more at MDL fell victim to political opportunism and lapsed, resulting in the closing down of the production line and migration of the workers who had gathered submarine construction skills to Australia. Concurrently, the IN acquired the Kilo Class SSKs from USSR. Ten of them were delivered between 1986 and 2000.

The IN then formulated a 30-year submarine-building perspective plan seeking the construction of 24 SSKs indigenously. It did not include either SSBNs or SSNs. The first six were to be built in collaboration with one source under Project 75. Six more were to be built in collaboration with another source under Project 75I, while the remaining 12 were to be an indigenous design
based on technologies acquired and assimilated under the first two projects. The perspective plan was approved by the CCS in July 1999. It speaks volumes for the conversion of approved plans into capability that the first submarine under Project 75 was delivered only in 2017, and delivery of the first six will be completed 23 years into the 30-year plan, in 2022. Proposals for the construction of submarines under the follow-on Project 75I have not yet been invited\(^\text{11}\). The chances of even one of the remaining 18 SSKs that the plan of 1999 called for entering service must be considered negligible.

**India’s Nuclear Submarine Programme**

 Barely a dozen years after USS Nautilus became the first SSN in the world to get “Underway on Nuclear Power”\(^\text{12}\) and even before its first SSK entered service, India looked at marine nuclear propulsion with preparation of a feasibility report by BARC and the IN\(^\text{13}\). The USS Enterprise incident in December 1971 and the US acquisition of Diego Garcia strengthened the political push. BARC was tasked with developing a submarine nuclear reactor, with the IN verifying the design. The project, however, made negligible progress and was re-launched as the ATV Project in the 1984. This time the DRDO was tasked with project management and a user (IN) representative with supervision. Vice Admiral MK Roy became the first Director General\(^\text{14}\) of the ATV Project, whose objective was to design and build an SSN. The successful Operation Shakti in May 1998 led to the political decision to convert the ATV’s goal into an SSBN. Assistance from Russia’s Rubin Design Bureau, including for reactor development, resulted in INS Arihant, which was commissioned in 2016. A second submarine of the class, INS Arighat, is expected to enter service this year, while at least two more are reported to be at the building stage. Reports also indicate that a fifth and much larger SSBN (S5) will follow\(^\text{15}\).

The Navy’s aspiration for indigenous SSNs, long put into cold storage due to budgetary constraints, had been revived by 2015, if not earlier. The then CNS told the media in 2017 that the Rs 60,000 crore plan to build six SSNs, each

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\(^{11}\) Huma Siddiqua, “The wait for submarines gets longer! Project 75I gets delayed further”, https://www.financialexpress.com/defence/the-wait-for-more-submarines-gets-longer-project-75i-gets-delayed-further/2209149/

\(^{12}\) History of USS Nautilus, https://ussnautilus.org/history-of-uss-nautilus/

\(^{13}\) V Adm GM Hiranandani, “Transition to Guardianship”, P 140

\(^{14}\) Yogesh Joshi, “India’s Quest for a Nuclear Submarine”, https://southasianvoices.org/indias-nuclear-submarine/

displacing about 6000 tons, was progressing. Design work was underway at a newly constructed submarine design centre in Gurugram. The proposal to build the SSNs, now estimated to cost about Rs 16,000 crores each, remained stuck at the bureaucratic level as economic planners questioned the need for the platforms during an economic crisis. Meanwhile, the major part of India’s SSK inventory approached the end of its useful life. The issue was flagged for the PM by the CNS at the Commanders ’Conference in March 2021, highlighting the pressing need to strengthen India’s conventional deterrent capability in the maritime domain.

**SSN Vis-à-vis SSK**

The modification to the plan that the IN is now reported to seek envisages replacing six of the remaining 18 SSKs with indigenously built SSNs. Both are intended to enhance conventional deterrence as well as provide offensive combat capability. The difference lies in where and how they can be used.

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16 Ibid


18 11 of the 15 SSKs in India’s inventory are over 29 years old. Only INS Sindhushastra (22 years of age) and the three Kalvari class are of recent vintage.
SSKs are limited by low underwater speeds, which preclude their keeping up with or seeking out surface ships. Typically, high value warships receiving information about a submarine in their intended path alter course to sidestep it, while detaching a Search and Attack Unit (preferably with onboard helicopters) to prosecute the submarine. Fuel capacity considerations also limit the range of SSK operation. The current generation of India SSKs, for example, technically have the range to operate anywhere in the Indian Ocean or to reach the South China Sea through the Malacca Straits, but could at best maintain a patrol of 10-15% of their 45-50 day deployment period, with the balance being spent on transit. SSKs are thus best suited for local operations (within about 2000 Km from base) against commercial traffic where the need for mobility is limited, as in high density shipping lanes or in the vicinity of choke points. They enjoy the advantage of substantially lower acoustic signatures as compared to SSNs, making them more difficult to detect. 39 countries operate SSKs today.

SSNs, on the other hand, have global reach. Their range and endurance enable employment anywhere in the world. They are capable of maintaining higher underwater speeds than warships can maintain on the surface, enabling their usage for both defensive and offensive purposes. In the defensive role, SSNs are used to provide underwater cover to a carrier battle group as well as for escorting SSBNs to distant patrol areas. In the offensive role, their speed and virtually unlimited range enables them to hunt down surface forces. They are thus far better suited for conventional deterrence than SSKs. On the other hand, the need to keep at least reactor cooling machinery running at all times generates an acoustic vulnerability that can be exploited by adversaries. It is noteworthy that France, UK and USA, all of whom have no regional threats and have global commitments, exclusively use nuclear propulsion for all their submarines.

**Operational Considerations**

In the 20th century, India's needs of maritime power were limited to being able to overcome newly independent regional adversaries, who themselves had little knowledge of and interest in the sea. India's Navy was structured accordingly. The USS Enterprise incident of 1971 did propel political understanding of the need to be able to deter great power adversaries, but non-availability of the required technology did not allow substantial investment in the IN force structure. As such, it did not really change the paradigm governing allocation of funds to the three services.
On the other hand, China formally set out its objective of becoming a maritime power in its 2015 military strategy white paper. The paper states, “The traditional mentality that land outweighs sea must be abandoned, and great importance has to be attached to managing the seas and oceans and protecting maritime rights and interests”. It also identifies safeguarding China’s security and interests in new domains and the security of China’s overseas interests as core strategic tasks for China’s armed forces. Funds for the PLA (Navy) have flowed thereafter. Fructification of an expansive shipbuilding programme provided China with a Navy that rivals the USN in the number of platforms and enables its coercive approach in the South and East China Seas, as well as prolonged deployment in India’s strategic doorstep, the Indian Ocean. These actions, coupled with its adventurism in Ladakh, make it clear that China seeks naval primacy in Asia. It has adopted a carefully planned strategy to achieve this objective. It can afford the limited costs involved in keeping India focused on the territorial domain, while not addressing the needs of the maritime domain, which is the key to India’s regional power aspirations.

The purpose of India’s Armed Forces is to deter conflict or military coercion directed against India. It is only when conflict is forced that the objective shifts to conducting operations to enable early termination on favourable terms. The political objective of India’s thrust for nuclear propulsion for submarines was to deter great power interference in the region. When it changed to providing the maritime leg of the nuclear triad after Pokhran II, the conventional deterrence objective was sidelined. The years since then have highlighted that nuclear deterrence is not enough to insulate India from coercion or conflict. Conventional deterrence is also needed, including in the Indian Ocean where China’s growing power overturns the paradigm that has shaped the Indian Navy’s force structure since independence.

India unveiled its first integrated ocean policy in 2015\(^\text{20}\). There is, however, a considerable gap between stated policy and execution, as brought out by this author elsewhere\(^\text{21}\). The impact of growing asymmetry between India’s and China’s maritime power has also been addressed\(^\text{22}\) separately. The lack of an approved national security strategy and differing interpretations amongst concerned stakeholders of where priorities lie result in the continuing procrastination in development of even critical maritime needs.

What type of submarine will it take to deter China conventionally in the maritime domain? The SSN is certainly far better than the cheaper SSK. In the land attack role, a Brahmos-2 equipped SSN can strike targets in China from the deep waters of the South China Sea, or from beyond the first island chain. Even Beijing comes within reach from the Sea of Japan. It is not impacted by Beijing’s Anti-Access/Area Denial ballistic missiles. In an anti-ship role, it can take on surface targets at similar ranges provided it receives targeting information, enabling it to remain outside the detection envelope of surface ships. Its speed enables it to hunt down surface ships: it cannot be sidestepped, unlike the SSK. It cannot, however, provide protection against aircraft. It cannot, therefore, replace India’s planned aircraft carrier. Both are needed.

How many SSNs are needed? This is a function of the missions assigned to them and the needs of training and maintenance. Five broad missions suggest themselves: taking the war to enemy territory; forming part of the integrated


battle group for strike tasks with an aircraft carrier at its centre; escorting our own SSBNs to their deployment areas; hunting for adversary surface forces in the Indian Ocean, and hunting for adversary SSBNs wherever they are deployed. Security planners must decide how many of these will be required simultaneously, both in the lead up to conflict, as well as during war. A thumb-rule employed by the US, with its advanced domestic industrial capability, calls for a force level of three units to ensure one is operationally available at all times, with another available at 15-30 days notice. India will have to evolve its own calculations, which cannot be based only on minimising cost. The need is for effective, not token capability.

Another operational facet is that advances in ASW technology have not kept pace with advances in submarine technology, but that is also because there has been no real push, particularly after the Cold War ended. Investment in SSNs is a strategic bet that submarines will always retain their edge. This may not hold – technologies that could make the seas as transparent as the air are being investigated and the return of great power competition will impart further a push.

Acquisition Timelines

The Request for Information in respect of Project 75I submarines was issued in September 2010\(^{23}\). AON was accorded in August 2011\(^{24}\). The project is meandering through the process, with proposals from potential builders still to be invited. For the Kalvari-class currently under construction, it took over 11 years from signing of the contract with the foreign collaborator for the first submarine to be delivered. The final submarine of the class will be delivered 16 years after signing of the contract. Going by this timeline, delivery of the first submarine under Project 75I is at least a decade away.

Similarly for the indigenous SSN. Media reports indicate that Acceptance of Necessity (AON) is yet to be accorded by the Defence Acquisition Council (DAC). Negotiation with the foreign collaborator will begin only after this approval. Going by the timelines for other projects, it could be 15 years or more before the first of them enters service. Reports regarding their inclusion in the current plan, which has just eight years to run, thus defy logic.

\(^{23}\) https://www.indiannavy.nic.in/sites/default/files/tender_document/P75I_RFI.pdf
\(^{24}\) Project 75 (I), https://www.globalsecurity.org/military/world/india/project-75-i.htm#:~:text=The%20Navy%20issued%20a%20Request,submarines%20at%20two%20indian%20shipyards.
Moreover, India is yet to gain the expertise required to design submarines on its own. Even the still-to-be-launched Project 75I relies on a foreign partner. A similar partnership will be needed for SSN construction. France and Russia both appear willing to provide design collaboration. A partnership with the US, if it can be brought about, would also provide a sharp fillip for the bilateral relationship. These factors will add to the timeline required for their induction.

Coming to the cost aspect, one report has indicated that each submarine will cost about Rs 15,000 crores ($ 2.3 billion)²⁵. Notwithstanding claims that funding will not pose a problem as it is spread out over several years²⁶, the reality is that in an era of flat budgets, finding additional resources will force difficult choices, unless there is a political decision to increase the Navy's budget share.

**Geopolitical Considerations**

Responding to a question about the present position of the India-China relationship at the opening keynote interview of the FT-Indian Express webinar on May 20, 2021, External Affairs Minister Dr S. Jaishankar had said²⁷

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²⁶ Ibid

²⁷ Opening Keynote Interview by External Affairs Minister at the FT-Indian Express Webinar, May 20, 2021,
that it was at a crossroads and which direction it went depended on whether China adhered to the 1988 consensus and followed through with adherence to subsequent agreements or not. He went on to say, “International politics is competitive ... it's not that I expect that I will progress in world politics without contestation and without competition”. His focus was on being prepared to compete.

The prospects of China returning to the 1988 consensus must be assessed as dim. If India is to compete, its ability to do so will depend to a large extent on the kind of hand it holds and the power it can bring to bear. Great powers (and even regional adversaries) expend substantial resources and effort in assessing and even shaping the hand their competitors hold. India must expect adversaries to continually determine whether it competes from a position of strength or weakness. The attempt to compete from a position of weakness resulted in the debacle of 1962. Whether India can reshape its navy to effectively compete in the maritime domain in the years ahead in the face of China’s burgeoning maritime power, thereby defending its interests and deterring unacceptable behaviour, will depend to a large extent on whether India possesses the foresight to finance preparedness for the Indo-Pacific great game that is the future, rather than focusing only on the undeniable economic and territorial crises of the present.

Conclusion

The geopolitical situation in the Indian Ocean has changed dramatically. China makes no bones about its intention to dominate Asia, as also its two maritime faces, the Western Pacific and the Indian Ocean. India understands that the Indian Ocean is the key to its future, but has not given sustained and adequate priority to securing this key by building a credible conventional deterrent.

India’s security planners must prioritise building an Indian Ocean Deterrence Initiative, on the same logic that drives the building of the Pacific Deterrence Initiative being constructed by the US in the Western Pacific. The actual constituents of India’s initiative will be different. However, maritime deterrence capability, including submarines, will constitute a vital component.

Despite being visionary and far-sighted, India’s submarine perspective plan of 1999 has languished due to strategic short-sightedness and dogmatic allocation of scarce financial resources, which have prioritised continental

https://mea.gov.in/interviews.htm?dtl/33871/Opening_keynote_interview_by_External_Affairs_Minister_at_the_FTIndian_Express_webinar
needs and allocated only leftovers to the Navy. The absence of an integrated ocean outlook could have explained this in the past, but that has been addressed through SAGAR. However, the gap that still remains between stated policy and its implementation indicates that strategic planning is still some distance away. This leaves India to rely on rhetorical statements, instead of focusing on being able to walk the talk.

Moreover, the submarine perspective plan of 1999 is now obsolete. It needs to be re-conceptualised and replaced on priority. Subtle hints that the plan is being altered at the Navy’s behest may serve the purpose of shifting blame for delayed execution, but will not address India’s current security predicament. A failure to invest now will result in failure of deterrence and perhaps a repeat of 1962, when the political leadership tried to compete with a bare hand. It is incumbent on the political leadership to ensure the creation of the bare minimum strength required to compete in the maritime domain. This bare minimum includes SSNs and aircraft carriers. The submarine project cannot replace the carrier project; both are essential.

The need is for a political push to cut through bureaucratic inertia, of the same nature as was imparted by Prime Minister Narendra Modi to the MMRCA (Rafale) project in 2014. The situation in respect of submarine capability is even more critical – only six of the planned 24 submarines will have been inducted on completion of the existing 30 year submarine perspective plan, while 12 of the inventory of 18 at that time will be as obsolete as the Mig-21s India continues to fly. Also, as had happened with the HDW project in the 1990s, infrastructure built at great cost to the nation and personnel trained will go to waste, once MDL is done with the Scorpene contract. The situation brooks no delay.

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