December 2023-January 2024 | Volume 18 No. 6 | ₹100.00 (India-Based Buyer Only)

INDIAN NAVY DAY SPECIAL 2023

SP's Naval Forces ROUNDUP

AN SP GUIDE PUBLICATION

www.spsnavalforces.com

THE ONLY NAVAL MAGAZINE FOR NAVIES ACROSS ASIA-PACIFIC

ISSN 2230-9276

Admiral R. Hari Kumar,
Chief of the Naval Staff

Five measures to transform India's journey towards self-sufficiency in defence manufacturing

Vice Admiral A.K. Chawla (Retd)

APPOINTMENT

Vice Admiral Sanjay Vatsayan appointed of Dy Chief of IDS (PP&FD) at HQ IDS

Vice Admiral Sanjay Vatsayan took over as DCIDS (PP&FD) on December 1, 2023. Prior to taking up this appointment, he was Deputy Chief of Integrated Defence Staff (Operations) since August 5, 2023. He is a graduate of the National Defence Academy, Pune (1986), Defence Services Staff College, Wellington, India (2003), Naval War College, Mumbai (2010) and National Defence College, New Delhi (2014).

▷ LEAD STORY

PHOTOGRAPHS: Indian Navy, PIB

Power Projection at Sea

Unveiling a 43 feet high statue of Chhatrapati Shivaji Maharaj to mark Indian Navy Day 2023, Prime Minister Modi touched upon India's Naval history and outlined vision for India's future in maritime development

(Top) Indian Navy's killer boats demonstrating their capabilities, speed and agility; (Above) To mark the Indian Navy Day 2023, Prime Minister Modi unveiled a Statue of Chhatrapati Shivaji Maharaj in Sindhudurg.

■ AYUSHEE CHAUDHARY

PRIME MINISTER NARENDRA MODI graced the Navy Day 2023 celebrations at Sindhudurg, Maharashtra, where he witnessed the spectacular 'Operational Demonstrations' featuring the prowess of the Indian Navy's ships, submarines, aircraft, and special forces on the scenic Tarkarli beach.

Navy Day, observed annually on December 4, marks the acknowledgment of the Indian Navy's pivotal role and commemorates its historic achievements, notably 'Operation Trident' during the 1971 Indo-Pak War. This year, the celebrations unfolded at Tarkarli beach, situated in Sindhudurg Taluk of Malvan District, Maharashtra, departing from the tradition of having them at major naval stations. The iconic backdrop for this significant event was the historic Sindhudurg Fort, constructed in 1660 by the renowned Maratha ruler Chhatrapati Shivaji Maharaj, symbolising India's rich maritime legacy.

A highlight of the festivities was the unveiling of a 43 feet high statue of Chhatrapati Shivaji Maharaj at Rajkot Fort by Prime Minister Modi. Conceived and funded by the Indian Navy, with support from the Government of Maharashtra, the statue stands as a testament to India's maritime heritage.

Under the theme "Operational Efficiency, Readiness, and Mission Accomplishment in the Maritime Domain," the Navy Day 2023 celebrations witnessed Prime Minister Modi inspecting the Guard of Honour at Rajkot Fort. The 'Operational Demonstration' showcased the Indian Navy's operational capabilities, covering a spectrum of naval operations, ships, and aircraft at the iconic Sindhudurg Fort on India's western seaboard.

Addressing the gathering, Prime Minister Modi expressed immense pride in celebrating Navy Day from the historic land of Sindhudurg. He underscored the foresight of Veer Shivaji Maharaj in recognising the strategic importance of naval capabilities, quoting Shivaji Maharaj's acknowledgment that control over the seas equates to ultimate power. Inspired by the ideals of Chhatrapati Shivaji Maharaj, Prime Minister Modi announced that the Indian Navy would align its ranks with Indian traditions, further underlining the empowerment of women in the armed forces.

Reflecting on India's diverse history, Prime Minister Modi celebrated not just the adversities but also the victories, courage, knowledge, science, art,

EDITORIAL

Heartiest felicitations to all personnel of the Indian Navy on the occasion of Navy Day 2023. This special issue of *SP's Naval Forces* marks this occasion. Under the theme "Operational Efficiency, Readiness, and Mission Accomplishment in the Maritime Domain," the Navy Day 2023 celebrations were witnessed by Prime Minister Modi at Rajkot Fort, Sindhudurg, Maharashtra. Unveiling a 43 feet high statue of Chhatrapati Shivaji Maharaj, Prime Minister Modi touched upon India's Naval history and outlined vision for India's future in maritime development. Prime Minister Modi stressed the need to regain India's lost maritime glory, highlighting the government's impetus to the Blue Economy through initiatives like 'Sagarmala' and 'Maritime Vision.'

On the occasion, Defence Minister Rajnath Singh, highlighted Shivaji's visionary contributions to India's naval tradition, emphasising the government's commitment to shedding colonial mindsets, as reflected in the adoption of a new naval ensign. "On this historic day we rededicate ourselves to the service of our great Nation & continue to serve with pride honour & unwavering commitment to National Security. Jai Bharat!" stated Admiral R. Hari Kumar, Chief of Naval Staff on behalf of all Navy personnel.

This issue also has an exclusive interaction between Admiral R. Hari Kumar, Chief of the Naval Staff with Jayant Baranwal, Editor-in-Chief, *SP's Naval Forces*. The Navy Chief gave his insights into the evolving landscape of Navy's strategies, combat preparedness and modernisation. He added that the Bharatiya Nausena (IN) is steadfastly striving for rapid modernisation of the Force through indigenous route and that "A three-carrier force would be essential to provide Sea Control Operations in the region".

In an article on Boosting Atmanirbhar Bharat, Vice Admiral A.K. Chawla (Retd) says that while, defence exports have increased tenfold since 2020, driven by the private sector, it remains dominated by low-value items and has suggested five measures to transform India's journey towards self-sufficiency in defence manufacturing.

All this and much, much more in this special issue of *SP's Naval Forces*. Happy Reading!

Also, we wish the valuable readers of *SP's Naval Forces*, a very Happy, Healthy and Prosperous Year 2024.

Jai Hind!

JAYANT BARANWAL
Publisher & Editor-in-Chief

**(Above on page) Prime Minister Modi inspecting The Guard of Honour upon his arrival;
(Below on page) The Prime Minister, Defence Minister, Chief of the Naval Staff and other dignitaries enjoying The Navy Day 2023 celebrations at Sindhudurg, in Maharashtra.**

creative skills, and maritime capabilities. He stressed the need to regain India's lost maritime glory, highlighting the government's impetus to the Blue Economy through initiatives like 'Sagarmala' and 'Maritime Vision.'

The Prime Minister discussed India's maritime strength, citing examples of ancient forts like Sindhudurg, the Indus Valley Civilisation port in Lothal, and the maritime influence of the Chola Empire. While lamenting the historical decline due to foreign invasions, Prime Minister Modi highlighted India's commitment to regaining strategic-economic strength.

Prime Minister Narendra Modi highlighted the transformative phase in India's history, predicting a future that will shape not only the next 5-10 years but centuries to come. The Prime Minister noted India's remarkable economic ascent, moving from the 10th to the 5th largest economy in the past decade, with rapid strides towards claiming the 3rd position. He drew attention to the emergence of India as a global friend ('Vishwa Mitra') and outlined initiatives like the India Middle East European Corridor, set to revive the historical spice route.

Prime Minister underscored the strength of 'Made in India,' citing achievements such as the Tejas aircraft, Kisan Drone, UPI system, and Chandrayaan-3. The imminent production of transport aircraft and the aircraft carrier INS Vikrant exemplifies India's self-reliance in defence.

A crucial aspect of the Prime Minister's address was the government's commitment to uplift coastal and border villages, treating them as priority areas for development. He highlighted the establishment of a separate fisheries ministry in 2019, accompanied by a substantial investment of 40 thousand crore rupees in the sector. The Prime Minister shared encouraging statistics, indicating an 8 per cent increase in fishery production and a 110 per cent surge in exports since 2014.

The Sagarmala Scheme, focused on value chain development in the fisheries sector, was emphasised for enhancing modern connectivity in coastal areas. Substantial financial investments are being made to attract new business and industry to these regions, promoting seafood processing-related industries, and modernising fishing boats.

Pointing to the vast potential in the Konkan region, Prime Minister Modi outlined various developmental initiatives, including the inauguration of medical colleges, the Chipi Airport, and the Delhi-Mumbai Industrial Corridor connecting Mangaon. Special schemes for cashew farmers and mangrove management projects in sites like Malvan, Achara-Ratnagiri, and Devgarh-Vijaydurg were also highlighted.

Prime Minister Modi stressed the need to regain India's lost maritime glory, highlighting the government's impetus to the Blue Economy through initiatives like 'Sagarmala' and 'Maritime Vision'

PHOTOGRAPH: Indian Navy

The Prime Minister underlined the significance of preserving heritage alongside development, with substantial funding directed towards the conservation of forts built during the period of Chhatrapati Veer Shivaji Maharaj in Maharashtra, including Konkan. This preservation effort is expected to boost tourism, create employment opportunities, and contribute to regional development. The government's efforts to promote merchant shipping, marked by a 140 per cent increase in seafarers over the past nine years, were highlighted. Prime Minister Modi expressed confidence in India's future, spotlighting unity, positivity, and the nation's commitment to a developed India.

In his concluding remarks, Prime Minister Modi celebrated the new tradition of holding armed forces days outside Delhi, expanding the reach of these occasions

PHOTOGRAPHS: Indian Navy

(Above) Fast Attack Craft demonstrating their agility in shallow water operations; (Left) Marine Commandos slither down to attack 'from the sea'.

ADMIRAL R. HARI KUMAR
PVSM, AVSM, VSM, ADC
Chief of the Naval Staff

Integrated Headquarters
Ministry of Defence (Navy)
New Delhi 110011

MESSAGE

My compliments to SP's Naval Forces on publishing a special issue on the occasion of Navy Week 2023.

In this *Kartavya Kaal*, the Indian Navy continues to remain Combat Ready in our operations, Credible in our actions, Cohesive in our approach, and Future-Proof in our ambition to become a fully *Atmanirbhar* force. Guided by the national inclusive vision for oceans - SAGAR (Security and Growth for All in the Region), the Indian Navy firmly believes in cooperating and collaborating with our friends and partners as well as Industries, Startups, Government Organisations and publications like SP's Naval Forces, towards development of latest niche and disruptive technologies.

Over the years, SP Guide Publications has been providing invaluable insights into various facets of our Armed Forces in general and the Navy in particular. This dedication to promote a culture of maritime consciousness is truly praiseworthy and has left an indelible mark on all its readers. I am confident that SP publications would continue to inform, inspire and influence.

I wish the team at SP's publication the very best in all their future endeavours.

Jai Bharat.

October 9, 2023

(R. Hari Kumar)
Admiral

Their courage & commitment will continue to inspire us in keeping our seas safe & transforming them into a symbol of cooperation & not competition/conflict," stated Admiral R. Hari Kumar, Chief of Naval Staff on behalf of all Navy personnel.

The Navy Day celebration, hosted by Admiral R. Hari Kumar and conducted by Vice Admiral Dinesh K. Tripathi, showcased the capabilities of the Indian Navy. The Operational Demonstration showcased capabilities of Indian Naval ships, submarines, aircraft, helicopters and Special Forces. The event saw participation of more than 15 major and minor warships (mostly indigenous) along with over 40 aircraft comprising MiG-29K, indigenous LCA Navy and Advanced Light Helicopter, as well as the newly inducted multi-mission helicopter MH-60R. Other major attractions included performance by the Naval Band, Continuity Drill by the Naval contingent and Hornpipe dance by the Cadets of Sea Cadet Corps. The grand event concluded with the traditional illumination of ships and the Sindhudurg Fort, symbolising the Navy's contributions to national security and nation-building.

throughout India. The Navy Day celebration event was a testament to India's maritime prowess and its dedication to preserving and advancing its rich maritime heritage.

Defence Minister Rajnath Singh highlighted the achievements in naval self-reliance, particularly the commissioning of the indigenous aircraft carrier INS Vikrant. Speaking on the occasion, the Defence Minister, termed the unveiling of Chhatrapati Shivaji Maharaj's statue as a moment of privilege. He highlighted Shivaji's visionary contributions to India's naval tradition, emphasising the government's commitment to shedding colonial mindsets, as reflected in the adoption of a new naval ensign. Rajnath Singh also commended Prime Minister Modi's dedication to enhancing naval capabilities, emphasising the importance of a strong Navy for any major global power.

On Navy Day 2023, Chief of Defence Staff, General Anil Chauhan extended his greetings and shared, "#OnPathToTransformation, the Indian Navy has always preserved & promoted our National Interests. It will continue to be a symbol of our nation's strength & resolve."

"On this historic day we rededicate ourselves to the service of our great Nation & continue to serve with pride honour & unwavering commitment to National Security. Jai Bharat! SamNoVarunah. We also pay homage to our brave hearts who have made the supreme sacrifice, in line of duty.

Charting India's Naval Power

On the occasion of Indian Navy Day, in a comprehensive interview to **Jayant Baranwal, Editor-in-Chief**, ***SP's Naval Forces,*** **Admiral R. Hari Kumar, Chief of the Naval Staff,** gave his insights into the evolving landscape of Navy's strategies, combat preparedness, modernisation, and HR initiatives

PHOTOGRAPHS: Indian Navy, IN_R11Vikrant / X

(Top) Admiral R. Hari Kumar, Chief of the Naval Staff, is driving the rapid modernisation of the Bharatiya Nausena (Indian Navy) through indigenous route;
(Above) Indigenous Aircraft Carrier (IAC-1) INS Vikrant. A repeat order of IAC-1 with suitable modifications to incorporate lessons learnt from IAC-1 and future capabilities envisaged is being pursued at this stage.

SP's Naval Forces **(SP's): Navy has been pushing the case for IAC-2 since many years. Recent reports suggest that the case is being pushed yet again. Why the IAC-2 is a necessity for India and what all capabilities will it bring to our Navy and what all opportunities will this create for the Indian industry?**

Chief of the Naval Staff (CNS): We, as a nation, have to shape our growth trajectory in tandem with our aspirations, roles and responsibilities. Having a robust National Security Policy and being militarily ready to address all threats and challenges is key to fulfilling this objective. Naval Acquisitions through indigenous shipbuilding provide a great opportunity to rekindle the national economy and be a key driver towards 'AtmaNirbhar Bharat', effectively ploughing back defence budget into the economy. The 'plough back' effect of indigenous construction of INS Vikrant, will be experienced on an even larger scale with the acquisition of a third carrier, with larger indigenous content and involvement of MSMEs/ancillary industries.

The Navy envisaged its future Indigenous Aircraft Carrier - 2 to be a 65,000 tonnes Carrier capable of maximum speed of 30 knots and employ Catapult Assisted Take-off but Arrested Recovery (CATOBAR) concept of flying operations. The carrier would be designed and built in India. India's growing dependence on the seas for national prosperity and growth requires commensurate capability to protect our SLOCs and maritime interests. In accordance with the MCPP 2022 - 37, it is envisaged that Indian Navy(IN) would need to undertake concurrent sea control operations by Carrier Task Forces (CTF) in geographically separate locations. Therefore, a three-carrier force would be essential to provide Sea Control Operations in the region. Considering the indigenous expertise available for designing and construction of IAC-1 (INS Vikrant), as well as the development of many new, wide technologies, a repeat order of IAC-1 with suitable modifications to incorporate lessons learnt from IAC-1 and future capabilities envisaged is being pursued at this stage. The case is under consideration at MoD.

SP's: Can you throw the light on the P-75(I) programme status and its future?

CNS: The case is being progressed as per the guidelines of the Strategic Partnership Model of the Defence Procurement Procedure. Field Evaluation Trials will be bids and this would be followed by commercial negotiations and contract conclusion.

SP's: China's combat preparedness – Kindly give us some inputs on our Navy's combat preparedness versus PLAN.

CNS: The PLAN has been expanding at an unprecedented pace and is expected to have a surface fleet of about 400 by 2025. While we may not be able to match the numbers, we are constantly fine-tuning our concept of operations and acquisition plans to effectively counter the threats that could be imposed by such a fleet. The *Bharatiya Nausena* is seized of the security implications of the enhanced Chinese presence in the Indian Ocean Region and maintains a constant and close watch on such developments. The actions of the IN may be summarised as follows:

- The IN maintains credible Maritime Domain Awareness (MDA) as well as an appropriate degree of readiness to meet any emergent situations.
- IN ships and aircraft are regularly deployed to maintain continuous and effective surveillance to monitor extra-regional/non-littoral ships and submarines in our area of operations/interest.
- Further, electronic surveillance of the maritime zones is undertaken using a chain of coastal/offshore radars, the National Automatic Identification System (AIS) chain and the Long Range Identification and Tracking (LRIT) System.

SP's: How do you perceive the overall strength of our Navy's fleet? Are you satisfied with the pace of modernisation and the inductions in view of the threat perceptions from East and West of our country?

CNS: The *Bharatiya Nausena* is steadfastly striving for rapid modernisation of the Force through indigenous route. The Navy is evolving continuously to meet emerging challenges to our maritime interests. The modernisation programme of IN is centred on Atmanirbharta which defines India's growth story. Threats, missions, capability development and affordability have, remained dominant factors in the force structure planning of the Service. The expansion plan in future includes the induction of aircraft carriers, state-of-the-art Next Generation Warships and submarines, Carrier-based fighters and helicopters as well as augmentation of unmanned solutions to enhance combat capabilities, and induction of niche technology and equipment to address emergent and future threats.

Towards expeditious capacity and capability building of the Navy, 65 out of 67 ships/submarines under construction are being built in Indian shipyards. Further, Acceptance of Necessity (AoN) also exists for the construction of 24 ships and submarines all to be constructed at Indian shipyards. While all these platforms will have a high indigenous content, they will be equipped with 'State of The Art' systems and advanced weapons and sensors with high lethality. While the *Bharatiya Nausena* evolves towards becoming a fully AtmaNirbhar Force, the Combat Capability of the platforms are given the highest priority. In addition, the Navy is already progressing well towards enhancing its surveillance capability through the induction of Long Range Maritime Aircraft, Remotely Operated/Autonomous Surface, Underwater and Aerial vehicles, with adequate impetus to emerging niche technology such as AI and Robotics to enhance IN's combat and surveillance capability.

SP's: Would you kindly like to comment as to how the Navy plans to absorb AI in its overall scheme of operations? It is being debated that AI will bring substantial number of advantages, however, it may also have some undesired disadvantages. Your views on this, please?

CNS: The aspects of artificial intelligence, machine learning and big-data analysis, coupled with extant capabilities for wide-area surveillance and networking would result into a transparent battle space with faster decision-making and enable fast-paced operations through Information Dominance.

'Hybrid Fleets' of crewed and un-crewed systems with AI, delivering greater capability at significantly lower operating cost, will be norm of the day. Un-crewed systems operating in all domains as a rapidly adaptable with AI and interconnected network will provide access to areas denied to crewed platforms, provide better situational awareness, greater range & persistence.

AI enables independent decision-making during the progress of operations with minimal manual intervention. However, the human element can be completely taken out from this loop. AI is not only a function of technological developments but also the appetite of the users who employ them. Accordingly, the levels of AI will largely depend on envisaged Concept of Operations (CONOPs), the environment in which our platforms operate, technological advancements and the level of autonomy that the users are comfortable to allow to these systems.

Bharatiya Nausena is progressively developing and implementing a framework for Data Unification and Management saw

best industry practices and has already established Centers of Excellence in 'AI' and Big Data Analytics. Towards nurturing the AI penetration, Indian Navy Incubation Centre for Artificial Intelligence (INICAI) has been established by IN in January 2023 at Bengaluru to fast track development of AI use cases in close liaison with Indian Industries. The IN has identified a total of 38 AI Use Cases for implementation. These include ops use cases for maritime operation viz., detection, identification, classification, collision avoidance, force protection measure etc and for training through language translators to aid in training of Indian and foreign trainees. These use cases are envisaged for implementation onboard shortly.

To maintain these critical initiatives, an AI core group has also been established by IN. The core group monitors the progress of AI in the IN and reviews all AI projects being undertaken by various stakeholders.

SP's: Request for updates on the latest initiatives towards boosting the morale of the human resource of our Navy as this remains the most important asset of any of the forces in the world.

CNS: As part of 'SHIPS FIRST' outlook, we are relentlessly pursuing to make our personnel happy by providing them with best of the amenities and infrastructure to improve the quality of life. In order to achieve our objectives towards boosting the morale of the personnel, various initiatives undertaken by IN are enumerated in succeeding paragraphs.

- **Key on Arrival:** As a progressive HR measure, the officers and sailors reporting on transfer are being provided accommodation through Key on Arrival initiative.
- **Digital HR Processes:** Adoption of digital HR processes is a key focus area towards enhancing transparency and 'ease of businesses'. Some of the major digitisation initiatives are as follows:
  - Electronic-CRs, e-Service Documents, SPARROW (Smart Performance Appraisal Report Recording Online Window) (for defence civilians), and a revamped HR website that facilitates online work flows for NOCs for passports, civil employment, change of address, joining report etc.
  - Indian Naval Entrance Test (INET) for Agniveer recruitment.
  - SWASTH Telemedicine.
  - e-Sehat.
  - SAMUHA Community website.
  - SPARSH for pensioners.
  - Digitisation of personal records.
  - Online delivery by Indian Naval Canteen Service.
- **Implementation of 360 Degree Appraisal System:** In addition to existing confidential reports by superiors, feedback from peers/colleagues and subordinates has been implemented as an additional input for promotion to higher ranks.
- Nari Shakti – Overall approach is that of 'All roles, all ranks'.
  - **Enhanced Avenues for Women:**

Women Officers Onboard Ships: Women officers have been appointed onboard warships commencing December 2020. Appointment of women officers' onboard warships was last undertaken from 1997 to 1999. However, it could not be implemented as a policy, due to limited availability of accommodation and facilities to cater to privacy needs of women officers. Further, in order to ensure zero discrimination, adequate platforms were required for routing all women officers, from sea going branches, for appointment onboard ships to enable their promotion to higher ranks. Therefore, at that stage, deploying women officers to sea could not be continued. In the last two decades, newer ships have been inducted into the Navy that cater for privacy needs of women officers. Therefore, commencing end 2020, women officers have been appointed onboard warships. Currently 33 women officers are appointed to ships and these numbers are being progressively augmented.

PHOTOGRAPH: SpokespersonMoD / X

Admiral R. Hari Kumar, Chief of the Naval Staff at the maiden Passing Out Parade of Agniveers batch at INS Chilka

Women Officer Induction: IN has commenced induction of women into all branches with effect from (w.e.f.) June 2023 batch.

With regards to NDA, entry of women cadets was commenced w.e.f. June 2022 batch and three vacancies were allocated to IN. Commencing January 2024 batch, the number of vacancies for women cadets at NDA have been increased from three to 12.

At Indian Naval Academy (INA), women cadets are now eligible to join through '10+2 B Tech' entry scheme. Applications for same have been received and their training would commence w.e.f. January 2024.

Also, women induction through 'UPSC/ NDA Entry' into INA would commence w.e.f. June 2024 batch.

"A three-carrier force would be essential to provide Sea Control Operations in the region"

Permanent Commission to Women Officers: SSC women officers in the *Bharatiya Nausena* are eligible for consideration for grant of Permanent Commission. As on date 72 women officers (excluding Medical and Dental officers) have been granted PC.

Women Agniveers: The first batch of Agniveers comprising 272 women candidates have completed their basic training at INS Chilka. Further, the interest of women candidates towards joining *Bharatiya Nausena* as Agniveer has been growing and a total of 462 women have been recruited in the second batch, who are presently undergoing training at INS Chilka. With the third batch inducted, Women Agniveer numbers have crossed 1,100.

Naval Air Operations (NAO) Officers on Helicopters: Until 2019, women officers were being commissioned as Pilots and NAOO only for shore-based aircraft. However, in order to employ women at par with male officers, women officers have also been streamed as specialist NAOO into helicopters commencing 2020, wherein they will operate from shipborne flights.

RPA Stream: Women officers can join the Remotely Piloted Aircraft (RPA) stream and the first woman officer joined RPA squadron in March 2021.

Overseas Assignments: Woman NAO officers are being deputed overseas since September 2020, as part of Dornier aircrew. Though the aircrew is being rotated after one year, at least one women officer has continued to figure in the selection merit. In addition, women officers are also deputed abroad for shorter durations as part of Mobile Training Teams and other foreign cooperation engagements.

- **Agnipath Scheme:** The Agnipath Scheme was launched by the Government of India on June 14, 2022. The scheme is aimed at transforming the Armed Forces into a much more youthful and technically adept warfighting force by ensuring a fine balance between youthful and experienced personnel in its ranks. Both men and women are being enrolled under this scheme and they are known as 'Agniveers'. In order to facilitate the enhancement of the education qualification of 'Agniveers', IN has initiated an Outreach Programme. Under the programme, IN has signed MoUs for award of Class XII certificates/ Degree/ Diploma (for SSR sailors). Following MoUs have been concluded with Ministry of Education and Ministry of Skill Development Entrepreneurship in this regard:
  - MoU with National Institute of Open Schooling (NIOS), for award of 12th pass certificate to 10th pass Agniveers.
  - MoU with IGNOU, to facilitate award of Bachelor's Degree to 12th pass Agniveers.
  - MoU with Directorate General of Training (DGT), under the Flexi-MoU scheme of DGT, to facilitate award of National Trade Certificate (NTC) to Agniveers.
  - Agreement with National Council for Vocational Education and Training (NCVET), for award of 'Awarding Body (Dual Category)' recognition to Services. HQ Southern Naval Command (SNC) is the AB (Dual) on behalf of IN. AB status would not only enable HQ SNC/Training Schools to create suitable Qualifications or 'Kaushal Praman Patra' for Agniveers, but would also empower them to align regular sailors' courses to the National Skill Qualification Framework (NSQF) of NCVET.
- **Community Living:** Naval Wellness and Welfare Association (NWWA) has been made more relevant to contemporary times including the change to gender neutral nomenclature. Some of the notable achievements of NWWA has been:
  - Conduct of G20 THINQ 2023, both at national and international level.
  - MoU with engineering colleges.
  - Early-intervention centres at naval commands.
  - SSB mentoring programme for naval wards.

Boosting Atmanirbhar Bharat

Five measures to transform India's journey towards self-sufficiency in defence manufacturing

VICE ADMIRAL A.K. CHAWLA (RETD)

A LOT OF GOOD WORK has been done to move India towards self-sufficiency in the defence sector over the past seven decades, and there are several achievements of which we can be justifiably proud, particularly in the maritime sector. The first two Defence Public Sector Undertaking (DPSU) shipyards, Mazagaon Docks Ltd (MDL) and Garden Reach Shipbuilders & Engineers (GRSE) were created in 1960. As a result, the first indigenous warship, INS Ajay, was built at GRSE in 1961. After that the progression towards a builder's navy and then, a designer's navy, was steady. The first indigenous frigate of British design, INS Nilgiri, was commissioned in 1972; the first indigenously designed and built frigate, INS Godavari, was commissioned in 1983; the first indigenously built submarine of German design, INS Shalki, was commissioned in 1992; the first indigenously designed and built destroyer INS Delhi, was commissioned in 1997; the first Indigenously designed and built strategic submarine, INS Arihant, was commissioned in 2016; and the first indigenously designed and built aircraft carrier, INS Vikrant, was commissioned in 2022.

Growth in Defence Production and Exports

By 2023, the indigenisation percentages achieved for indigenous warships stood at 95 per cent in the 'Float', 60-65 per cent in the 'Move' and 50 per cent in the 'Fight' components. The achievements in terms of overall defence production and export have also been heartening. After the Defence Production and Export Promotion Policy (DPEPP) was promulgated August 2020, targeting exports of ₹35,000 crore in aerospace, defence goods and services for the period 2020-25, concerted efforts have ensured that India achieved defence exports of ₹16,000 crore in 2022-23 – a tenfold increase from 2016-17. More importantly, 70 per cent of the contribution came from India's nascent private sector defence industry, demonstrating its potential for growth. Overall, over 100 public and private sector defence companies are today exporting defence products to over 85 countries in Africa, South Asia, Southeast Asia and West Asia. Recent additional policy initiatives promoting defence exports include: simplified defence export and industrial licensing processes; Foreign Trade Policy incentives; MEA facilitation of Line of Credit to friendly foreign countries to import Indian defence equipment, etc. In the last two years, there have also been creditable achievements in innovation/ indigenisation under the DIO/ NIIO-SPRINT/ iDEX/ TDAC umbrella.

Despite the undeniable progress achieved thus far, many issues remain to be resolved to transform India into a global powerhouse for defence manufacturing and exports. The principal shortfall remains the major import component in the 'Move' and 'Fight' components of sensors and weapon systems. As a result, India remained the top importer of defence equipment in the world in the period 2018-22 with a share of 11 per cent of all global arms transfers, largely from Russia, France and Israel, as per SIPRI's 'Trends in International Arms Transfers 2022' report. India also did not figure in the top 25 arms exporters in the world who together comprise over 98 per cent of all global arms exports, with India not even mentioned as an arms exporter in the report, indicating its negligible global share. Moreover, over 70 per cent of the ₹16,000 crore worth of defence exports by India remained low value items and low tech items. It is, therefore, abundantly clear that if India is to enhance indigenisation in the crucial and technology intensive fields of weapons, sensors and propulsion engines, several policy changes will need to be made to India's defence industry and economics. This article suggests five major changes that would go a long way in boosting indigenisation and exports in the defence sector.

PHOTOGRAPHS: IN_R11Vikrant / X, Indian Navy

SHINING EXAMPLES OF ATMANIRBHAR BHARAT:
IAC-1 INS Vikrant (Top) and Scorpene Submarine INS Vagsheer (Above) are indigenously manufactured warships.

Streamline Planning, Procurement, and Budgeting Process (PPBP)

The first major step is related to our planning, budgeting and acquisition process. India needs to promulgate an apex level security strategy document akin to a National Security Strategy (NSS) to provide the apex political guidance in terms of the threats expected and the measures necessary to combat these threats. Any force-level planning and budgeting process in the absence of a NSS-equivalent document (and lower-level policy documents) would be flawed, to say the least. Indeed, the 10-year Integrated Capability Development Plan (ICDP), the 5-year Defence Capital Acquisition Plan (DCAP) and the 2-year Annual Acquisition Plan (AAP) need to be worked out in consonance with the current and future security environment, the nature of future warfare, the types of roles and missions expected to be executed by the Armed Forces, changes in technology, etc, all of which need to specified in the apex and subordinate level policy documents. This is essential to prevent a mismatch between what the government expects and what the Armed Forces will deliver in terms of national security. The PPBP will also ensure that scarce national resources allocated for the country's security are invested wisely and in accordance with an overall national plan, which synergises all national agencies towards a common goal.

India has achieved significant progress in maritime defence indigenisation, building warships like INS Arihant and INS Vikrant

The second major issue relates to a number of changes that need to be made to our budgeting process and the government's General Financial Rules (GFR), to make it more efficient and cost-effective. The basic mismatch between our budgeting system and defence capital procurement is that the budget lapses at the end of the current financial year, while contracted capital schemes extend over multiple years. This mismatch is not endemic to India, but is exacerbated by the delays in our procurement process, which tend to shift across multiple financial years, throwing financial planning into disarray. To resolve this anomaly, the Parliament's Standing Committee on Defence (SCOD) has time and again recommended a 'non-lapsable' capital budget. However, this provision is not permissible – both by our Constitution as also by the GFR 2017. The 15th Finance Commission has also recommended a non-lapsable modernisation fund for defence and internal security, which needs to be adopted so that there is more certainty between force-level planning and its financial outlay. There are also several smaller amendments required to be undertaken in the GFR. For example, the GFR does not include provision for either an Option Clause or a Repeat Order. There is also no provision to cater for quality for the evaluation of a defence product to be contracted, and the decision rests solely on the minimum price – the L1 syndrome – which is detrimental to the quality of a contracted defence item. The Government E-Market (GeM) process now has the provision for a 'reverse auction,' which has saved the exchequer up to 25 per cent in overall costs. However, this provision is not there under the GFR.

Simplify the Acquisition Process

The third major issue that needs to be resolved relates to further streamlining and hastening our acquisition process, which despite several positive changes over the past two decades, remains rather pedantic. For this reason, it is normally not possible to adhere to the procurement timeline laid down the DAP for major procurement cases, which is stipulated as 74 to 106 weeks from Acceptance of Necessity (AoN) of the case to contract conclusion stage. For e.g. the P-75(I)case was first taken up in 2008 and still remains to be contracted. There are several such examples of delays in the procurement of major weapon systems, leading to capability voids, escalating procurement costs and a tail-chase of technology, which advances many times faster than the procurement process. The reasons for the delays include: the multiple levels of processing of procurement cases within Service Headquarters, the Department of Military Affairs (DMA) and the Department of Defence (DoD); and repetitive financial scrutiny by MoD (Fin) and Main Finance in the Ministry of Finance (for cases requiring approval of the Cabinet Committee on Security). As such, ship and submarine construction after contract conclusion is also a long process, which in India can take between 10-20 years to complete. As an example, Government approval for the Indigenous Aircraft Carrier (IAC) was accorded in 2001, while the ship was commissioned in 2022.

The fourth major issue is the lack of an institutional provision of a single vendor for major defence contracts, due to a fixation on the seeming virtues of a multi-vendor process (DAP 2020 does have a limited provision for 'Ab Initio Single Vendor Cases' which needs to be expanded). This provision was provided for by the 2004 Kelkar Committee set up by the government to recommend changes in the

acquisition procedure and enable greater participation of the private sector in defence production. In their report submitted in 2005, the committee recommended (inter alia) the provision of 'Raksha Udyog Ratnas/ Champions (RUR)' in the private sector, and the provision was included in DPP-2006. This provision would have brought such private sector companies on par with DPSUs. The RURs were also to be reimbursed 80 per cent of their defence R&D expenditure. Subsequently, the Prabir Sengupta Committee was appointed to select RURs and short-listed 15 applicants. However, the process languished due to allegations of favouritism, opposition from within the Government, the trade unions, the DPSUs and even sections of the private sector. In 2013 the government decided to scrap the provision of RURs, justifying it on the introduction of the 'Buy and Make' category in DPP-2012, which was open to both the private and public sectors. However, this did not lead to major gains in indigenisation. In subsequent years the government has taken several additional measures to encourage private sector participation, such as 'Buy Indian,' 'Buy Indian-IDDM', 'Make-I', 'Make-II', Make III,' enhancement of FDI, amendments to the DAP-20, etc, which have further eased funding and support to defence innovation.

However, while there has been growth in the private sector, which has expanded both in numbers and technical sophistication, production of major weapon platforms and systems remains the exclusive preserve of the DPSUs. The reason for this is the episodic nature of orders for major defence equipment, which in the absence of an assurance of future orders, makes retention of human expertise, and maintenance of specialist infrastructure and equipment cost prohibitive for Indian defence manufacturers. This factor is also a major disincentive for investment in defence R&D by the private sector. This leads to a vicious cycle of import dependence or license production where we may get the 'know-how' but are unable to obtain the 'know-why'. Therefore, while multi-vendor competition is a good thing for common-use and high turnover items, it is a disincentive for major defence equipment.

For this reason, all major defence manufacturers in the world enjoy a single, or at the most a dual vendor situation. They can continue their business because they are not only subsidised by the government, but are also assured further orders as also maintenance contracts for the equipment that they produce. Because of this they have also been able to develop export markets, and the economies of scale thus achieved enable plough-back of funds for R&D enabling constant technological improvement in quality and capability. To facilitate single vendor nomination the US has created the Defence Contract Audit Agency (DCAA) which conducts detailed independent audits of all defence contracts and ensures price reasonableness and quality of contracted items, especially for single vendors. This is a good model to follow, as without single vendor nomination for big ticket and technology intensive defence equipment, India will not be able to build up its defence industry and indigenise the 'fight' and 'move' categories of our defence equipment.

Achieving defence self-sufficiency will strengthen national security and contribute to economic growth and technological advancement

PHOTOGRAPH: Indian Navy

Naval Destroyer INS Imphal, built by Mazagon Dock Shipbuilders, is a hallmark of indigenous shipbuilding and is amongst the most technologically advanced warships in the world

Create a Dedicated Defence Exports Organisation

The fifth and final major issue is the lack of a defence exports organisation. All countries with major defence exports have a dedicated organisation to handle the entire process of defence exports - from staff requirements to construction, trials, delivery, guarantee issues, etc. Indeed, the entire gamut of issues to acquire, operate and maintain complex defence systems, such as training, spares, operating philosophy, etc requires a dedicated organisation such as the Naval Sea Systems Command (NAVSEA) in the US (for export of naval weapon systems), Rosboronexport in Russia or Direction Generale de L'armement (DGA) in France. One reason why India has been able to export only a limited number of major weapon systems thus far is the absence of such an organisation. It is understood that the Department of Defence Production (DDP) has been requested to set up such an organisation. We need to develop a model that suits our environment, if we are to move up the value chain of defence exports.

Navigating the Indo-Pacific Chessboard

Unraveling the Geopolitical and Strategic shifts from Maldives to Bay of Bengal

LT GENERAL P.C. KATOCH (RETD)

THE ELECTION OF PRO-CHINA politician Mohamed Muizzu as the eighth President of Maldives this September was reported in these columns earlier, as also that in 2022, Muizzu told Chinese Communist Party officials while visiting Beijing that his party's return to office would "script a further chapter of strong ties between our two countries". On October 2, 2023, China congratulated Muizzu for his victory. In his electioneering speeches, Muizzu criticised India indirectly for influencing decisions of the outgoing Solih Government. He also said he would not allow foreign troops in Maldives – oblique reference to Indian helicopters and personnel, positioned to evacuate the sick from distant islands in the archipelago.

For his oath taking ceremony and inauguration of the new government on November 17, 2023, Muizzu invited Prime Minister Narendra Modi. India, however, was represented by Union Minister of Earth Sciences Kiren Rijiju. Other foreign dignitaries also included Sri Lanka President Ranil Wickremesinghe and Special Envoy of the President of China and State Councilor Shen Yiqin (who visited Maldives in 2014 when Muizzu's mentor Abdulla Yameen was President). Pakistan was represented by Murtaza Solangi, Federal Minister of Information & Broadcasting and Parliamentary Affairs.

Shortly after taking oath as President, Muizzu said, "The country will not have any foreign military personnel in the Maldives." On the first day in office the next day, Muizzu formally asked India to withdraw its troops from Maldives. His office issued a statement saying, "The President formally made the request when he met the Minister of Earth Sciences of India Kiren Rijiju, at the President's Office earlier today." This was despite the fact that India is developing almost 40 projects in Maldives, including the $500 million Greater Male Connectivity Project.

Earlier in the week, Muizzu had told media that his intention was not to upend the regional balance by "replacing the Indian military with Chinese troops". But China's Peoples' Liberation Army (PLA) personnel are already in Maldives in the garb of civilians in development projects (well known to Muizzu) – as is the case in all foreign Chinese ventures. This is also a lesson for India. Knowing the politics within Maldives and hardcore China shift during the presidency

Shortly after taking oath as President, Muizzu said, 'The country will not have any foreign military personnel in the Maldives'. On the first day in office, Muizzu formally asked India to withdraw its troops from Maldives.

PHOTOGRAPHS: KirenRijiju / X, presidency.gov.mv

(Top) Minister of the Earth Sciences of India, Kiren Rijiju, paid a courtesy call on Dr Mohamed Muizzu, President of Maldives at the President's Office; (Above) The Special Envoy of the Chinese President, Shen Yiqin, State Councillor of the People's Republic of China, meeting President Dr Mohamed Muizzu.

of Abdullah Yameen, why did we not place civil helicopters and civilian pilots (or naval pilots on deputation) in Maldives for the task? Doesn't this show lack of forethought and foreign policy deficit on our part?

Spread over 90,000 sq km, Maldives is located 600 km off India's coast and 750 km south-west of Sri Lanka. Global east-west shipping lanes pass its 26 atolls and 1,192 islands stretching around 800 km across the equator. Its geostrategic value is from three of the most important SLOCs through which most of India's trade and oil requirements pass, apart from its close proximity to India and Sri Lanka. As President, Muizzu inspected the 'Greater Male connectivity project on November 20. He had previously pledged to expedite the completion of the Greater Male Connectivity - Male to Thilafushi Link Project.

Some media channels are calling Maldives' pro-China regime insignificant. But not acknowledging the fast changing geopolitics in the Indo-Pacific – big power play in backdrop of the wars in Ukraine and Gaza, plus Chinese machinations in the Indian Ocean Region (IOR), would be naïve. A pro-China Maldives must be viewed in concert with Pakistan in Beijing's lap and Sri Lanka committed to China's BRI and docking of PLA Navy (PLAN) ships and submarines at Colombo.

Pakistan's entire seacoast is available to the Chinese military. Witness periodic China-Pakistan naval exercises including the recent weeklong naval exercise (November 11-17, 2023) in northern Arabian Sea; an area that has witnessed India-Pakistan naval battles in the past, last one during the Liberation of Bangladesh in 1971. China and Pakistan appear testing the waters and preparing for an eventuality/opportunity against India or along the Gulf-Arab coastline that can be exploited in geostrategic and or geopolitical terms.

Heightened US-Iran tensions and turmoil in the Gulf has repercussions for the northern Arabian Sea. China has a stronger hold over Pakistan despite the US and the UK trying to revive strategic links with Pakistan. China always planned a "transshipment" port in Maldives, which would establish a naval presence in the archipelago. China's 'hold' on Maldives is the debt Maldives owes to China and the large number of Chinese tourists visiting Maldives. But the China-Pakistan-Maldives conundrum must also be viewed in concert with Chinese activities along the Bay of Bengal – in Bangladesh and Myanmar.

Since 2010, more than two-thirds of Bangladesh's arms imports have come from China. Recent satellite imagery shows

China's state-owned firms CITIC and China Harbor Engineering Company seek to develop a deepwater port and a special economic zone project at Kyaukpyu, termed 'model project' in China-Myanmar BRI cooperation by the Chinese media

China has made significant progress on a naval base it is constructing in Bangladesh which houses two Chinese submarines transferred to Bangladesh in 2016 for just $203 million. In 2017, China's state-owned defence contractor Poly Technologies secured a $1.2 billion contract to build a new submarine support facility in Bangladesh; work on the BNS Sheikh Hasina Naval Base, a 1.75 sq km facility, began in 2018.

Inauguration of the above facility was held in March 2023. Prime Minister Sheikh Hasina, praised its capabilities, calling it "ultra-modern." Several Chinese officials, including at least two senior PLAN officers, were present at the ceremony. Sheikh Hasina said the base could be a service point for ships sailing in the Bay of Bengal (read docking of Chinese vessels). Satellite imagery of July 2023 shows construction is continuing and on completion the base will be capable of docking six submarines and eight warships simultaneously. PLAN personnel will naturally continue at the base for 'training'.

In 2021, China transferred a Type 035B (Ming-class) submarine to Myanmar, possibly free of cost because India had gifted Myanmar a Russian-built Kilo-class submarine. In 2022, the new Chinese-built submarine docked at Myanmar's Thit Poke Taung Naval Base, which juts into the Bay of Bengal. Satellite imagery of April 2023 provides a bird's-eye view of the base, with the Chinese-made submarine clearly visible. Thit Poke Taung Naval Base is 10 km north of Kyaukpyu Port, home to one of China's marquee infrastructure projects in the region. Also, China invested billions of dollars to build liquefied natural gas (LNG) and oil facilities and pipelines from Kyaukpyu Port to Yunnan Province in southern China.

China's state-owned firms CITIC and China Harbor Engineering Company seek to develop a deepwater port and a special economic zone project at Kyaukpyu, termed "model project" in China-Myanmar BRI cooperation by the Chinese media. The $7.3 billion project is to begin construction after an ongoing environmental assessment is complete. The entire zone will be under CITIC control for 50 years.

The military coup in Myanmar provides a better opportunity for China to consolidate relations with Myanmar. Interestingly, the US Department of Defense (DoD) has Bangladesh and Myanmar on its short list of locations where Beijing has considered establishing overseas military facilities. SP

SP GUIDE PUBLICATIONS

Rosoboronexport Ready for New Industrial Partnerships with India

Russia remains one of India's major partners in the formation and strengthening of its Armed Forces

PHOTOGRAPHS: Rosoboronexport

HISTORICAL MOMENTS:
INS Vikramaditya has become the Indian Navy Flagship

NOVEMBER 16, 2023 MARKS the 10th anniversary of the transfer of the Project 11430 aircraft carrier INS Vikramaditya to the Indian Navy. Vikramaditya became the flagship of India's Navy.

For decades, Russia was and remains one of India's key partners, which has played a crucial role in the formation and strengthening of its national Naval Forces. And not just the Navy, military-technical cooperation between Russia and India is an example of partnership with a number of completed and ongoing joint projects for all services of the Indian Armed Forces.

Today Rosoboronexport offers new points of cooperation within the joint development and production of high-tech products on the premises of Indian enterprises. Rosoboronexport expects to work extensively with state-owned and private enterprises of the Indian defence industry with a view to expanding the scope of industrial partnership between Russia and India in accordance with the requirements of India's flagship programs 'Make in India' and 'Atmanirbhar Bharat'.

Besides, Rosoboronexport began working with Indian enterprises under conditions similar to the requirements of the aforementioned programmes long before their announcement. This is another fact that cannot be ignored.

Unleashing the Hypersonic Fury

Hypersonic Anti-Ship Ballistic Missiles of China pose a deadly threat in the uncharted waters of Naval Warfare

■ VICE ADMIRAL A.K. CHAWLA (RETD)

EVER SINCE THE ADVENT of the anti-ship missile (AShM) in the 1960s, there has been a constant battle for superiority between AShMs and anti-ship missile defence (AMD) systems. The very first AShMs was ashort range air-launched version (HS 293 Fritz X), made by Nazi Germany during the Second World War. Launched by Luftwaffe bombers, they were radio command or camera-guided on to their target by the bombardier, and were used with telling effect, especially against British and American warships in the Mediterranean during the amphibious campaign to liberate Italy in 1942-43. Radio jamming measures developed shortly thereafter by Allied navies negated the effectiveness of these missiles. While the US Navy also developed an air-launched AShM (SWOD-9 Bat) in 1945, it saw very limited usage against Imperial Japanese Navy ships, as the war ended in August 1945.

Development and Use of Anti-ship Missiles

After the Second World War ended, the Soviet Union took the lead in the development of ship-launched AShMs with the highly effective SS-N-2 Styx AShM. While they also developed air and submarine launched versions of the missile, the ship-launched version had the advantage of being able to carry a heavy warhead, and this along with the liquid fuel in the missile, made it very effective, even against a large warship. Indeed, the first sinking of a warship by a ship-launched AShM was the Israeli Navy destroyer Eilat, which was hit by a SS-N-2 Styx missile launched from a Egyptian Komar-class missile boat off the Sinai peninsula during the 1967 Arab-Israel War. This was followed by the famous attackson Karachi by Osa-class missile boats of the Indian Navy during the December 1971 Indo-Pakistan War, which destroyed almost two-thirds of the Pakistani Navy, besides causing extensive damage to installations and oil storage facilities in Karachi harbour.

AShMs have been used in all subsequent wars, most notably in the 1973 Yom Kippur War, the 1982 Falklands War, the Iran-Iraq War (1980-88), the First Gulf War in 1990 and the Second Gulf War in 2003. AShMs have also been used with telling effect in the Russia-Ukraine War by Ukraine, illustrated by the sinking of the Russian Navy heavy cruiser, the Moskva, which was reportedly hit by two land-launched Neptune AShMs (the Russians claim it sank because of an internal explosion after a fire on board). A new and worrying development in the 21st century has been the use of AShMs by non-state actors to target both warships and merchant ships – the Hezbollah hit an Israeli Navy Sa'ar 5-class corvette with a Chinese-built C-701 AShM in 2006 and the Houthis have targeted several merchant ships in the Red Sea with anti-ship ballistic missiles in recent months.

China has done extensive test firings of its missiles over the past few years. The US Department of Defense reported that more than 135 live ballistic missile firings were conducted in 2021 (250 were conducted in 2020), which was more than the tests carried out by all other countries combined in the world.

AShMs have become deadlier over the years as earlier versions with higher trajectories, which were easier to track and shoot down by ship-based missile and gun systems, have been replaced with sea-skimming missiles travelling at supersonic speeds. While AMD measures (both active and passive) against AShMs have constantly improved, AShMs have retained a slight edge, principally due to the fact that offense always has an advantage over defence, especially if the surprise factor is maintained. However, the recent development of hypersonic anti-ship ballistic missiles (AShBM), in ship, air and land launched versions, threatens to tilt the scales substantially in favour of the AShM. This article examines the development of China's YJ-21 Eagle Strike Hypersonic AShBM to assess the threat they pose and what can be done to mitigate it.

The Rise of Chinese Hypersonic Anti-Ship Ballistic Missiles

The PLA Navy (PLAN) first released the footage of a test firing of the YJ-21 hypersonic AShBM from the universal launch system of their 13,000 tonne Type 055 Renhai-class cruiser (termed as a destroyer by China) in April 2022. It is estimated that the missile can also be fired from the Type 052D destroyers of the PLAN. There is also an aerial version of the missile which can be fired from China's H-6 bombers. Guided by the Beidou satellite navigation system, the missile travels at a speed of Mach 6 during the cruise phase and at Mach 10 in its terminal phase. On January 30, 2023, the official Weibo account of the People's Liberation Army Strategic Support Force (PLASSF) stated that the YJ-21 could not be intercepted by any anti-missile weapon system in the world. The credibility of the claim is supposed to be high as the PLASSF is responsible for data gathering and weapon analysis of all Chinese weapon systems. The Chinese claim that even if the missile is intercepted in its terminal phase, the velocity of the missile fragments is sufficient to seriously damage the target ship. According to US-based intelligence inputs, intercepting the missile is extremely difficult because of their capability to manoeuvre dynamically on re-entry, also making it more effective against moving targets such as ships.

Interestingly, an export version of the missile called YJ-21E had also been publicly show-cased at the Zhuhai Air Show China in 2022, where it had also been claimed that it was being developed for 'offshore defence' implying its possible use as a shore-based weapon for sea denial, inconsonance with China's of Anti-access Area Denial strategy (A2AD). The missile is compact enough to be mounted on mobile carriers as well for use as shore missile battery.

What makes the weapon even more formidable is the fact that the Type 055 cruiser has a 112 Vertical Launch System (VLS) cells, which can carry a combination of YJ-18/ YJ-21 anti-ship missiles, HHQ-9 surface-to-air missiles, CJ-10 land attack cruise missiles, and anti-submarine missiles, which can be carried in any configuration. A recent article stated that the PLAN had war-gamed firing of different numbers of YJ-21 missiles against a Ford Class aircraft carrier group and concluded that a salvo of 24 missiles would sink the carrier after overcoming its defences. It is clear that the PLAN is following the old Soviet (and current Russian) philosophy of large salvo firings against capital warships such as cruisers, destroyers and aircraft carriers, to swamp the adversary's anti-missile defence systems, and cater for redundancies due to malfunction. While this earlier required a larger number of platforms when the carrying capacity of individual warships using conventional launch systems was limited, the introduction of below-deck VLS on the Type 052-D and Type 055 cruisers, has largely obviated this problem. The PLAN has already commissioned six Type 055 cruisers (of a total planned number of eight), at least two of which would accompany a PLAN aircraft carrier group, or be deployed independently as surface attack units.

It is also relevant to note that the YJ-21 would not be used in isolation in a sea battle. China has several AShMs in its order of battle, which would be fielded on a variety of surface, sub-surface, aerial and land-based platforms, as shown on the table below.

China's Naval Dominance

China is today the largest navy in the world with 370 active modern front line ships (not including 60 ASCM carrying patrol vessels/smaller combatants). What makes China a formidable maritime adversary is the variety and numbers of anti-ship weapons that it can bring to bear on an adversary within the first island chain, not only from the mainland and from ships/submarines deployed at sea, but also from military bases built on several reclaimed islets in the South China Sea. This targeting area is now slowly extending outwards as the

Major Chinese Anti-ship Missiles

YJ-83/ YJ 83A/YJ-83J

Range (km): 120/180/250
Warhead Type: 180 kg Conventional
Firing Platform: Aircraft/Ships
Missile Speed: Subsonic

YJ-12

Range (km): 250-400
Warhead Type: 205-500 kg Conventional
Firing Platform: Aircraft/land-based launchers/Ships
Missile Speed: Subsonic cruise phase with terminal supersonic speed

YJ-18

Range (km): 220-540
Warhead Type: 140-300 kg Conventional/Anti-radiation
Firing Platform: Ships/Submarines
Missile Speed: Subsonic cruise phase with terminal supersonic speed speed

DF-21/A/C/D

Range (km): 1,770
Warhead Type: 600 kg Conventional/5-6 200-500 KT Nuclear MARV-capable
Firing Platform: Land-based launchers
Missile Speed: Hypersonic cruise phase, supersonic terminal phase

DF-26/B

Range (km): 5,000
Warhead Type: 1,200-1,800 Conventional/Nuclear
Firing Platform: Land-based launchers
Missile Speed: Hypersonic cruise phase, supersonic terminal phase

YJ-21

Range (km): 1,500
Warhead Type: Conventional
Firing Platform: Aircraft/Ships
Missile Speed: Low Hypersonic cruise and High Hypersonic terminal phase

SP GUIDE PUBLICATIONS

capability and range of Chinese sea, air and land launched weapon systems increases. This fact has been acknowledged in the last few editions of its Congressional Research Service Report on "China's Naval Modernisation: Implications for US Navy Capabilities", in which it has clearly acknowledged the PLAN would effectively challenge the ability of the US Navy to maintain sea control in the blue water ocean areas in the Western Pacific during a possible future conflict with China.

It is also notable that China has done extensive test firings of its missiles over the past few years. The US Department of Defense reported that more than 135 live ballistic missile firings were conducted in 2021 (250 were conducted in 2020), which was more than the tests carried out by all other countries combined in the world. This indicates that China is honing both the hardware and software of its missiles through extensive testing and also has a strong domestic manufacturing capability, which would allow it to easily build-up and maintain the inventories needed during a future war.

Countering the Hypersonic Threat

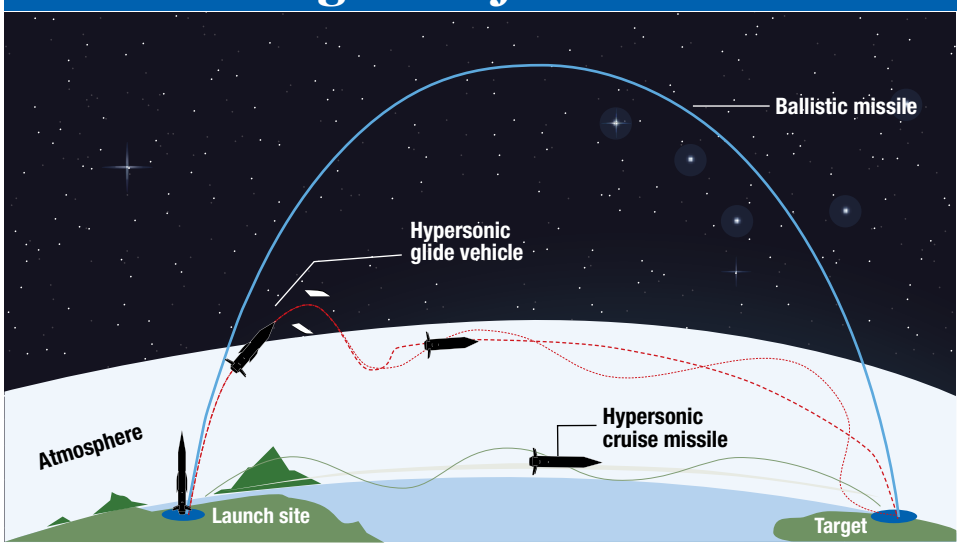
In the face of an adversary with such a numerical and qualitative edge, the measures that need to be taken by other major navies, such as the US and the Indian Navy, could be classified under the development and warfighting heads. As far as development is concerned, this also needs to have two major prongs, offensive and defensive. Offensive measures would include the development of equally or more capable ship, submarine and air launched hypersonic ASBMs/ASCMs (such as Raytheon's SM-8, Japan's planned "island defence anti-ship missile" and Hyper Velocity Gliding Projectile (HVGP) and India's nascent Hypersonic Technology Demonstrator Vehicle (HSTDV)), as also the development (particularly for India) of shore-based ASBMs for pre-emptive attack. The latter option is a particularly good one to combat a future PLAN aircraft carrier group in the Indian Ocean, especially using the favourable geography provided by our island territories. Future AShMs, both ASCMs and ASBMs, also need to be designed with redundant guidance systems (satellite, inertial navigation, infra-red and radio frequency) to increase their survivability against soft-kill measures.

As far as actual warfighting is concerned, any adversary weapon system is best countered with tactics for a specific geographic environment and the individual characteristics and design attributes of a specific weapon. Chinese AShMs will be most effective in the geographical environment in which they plan to execute their A2AD strategy, which is within the first island chain. However, their effectiveness would be reduced in the open ocean and in a geographical environment conducive to their adversary, such as the north Indian Ocean region. For example, countering this weapon by the Indian Navy (IN) would require a relative numerical superiority of weapon platforms and AShMs in all dimensions – surface, sub-surface aerial and land-based – which should be endeavoured to be made available in the north Indian Ocean. Along with this, an accurate MDA picture would be required for early detection and weapon targeting at maximum ranges, while denying the same facility to PLAN forces. At the tactical level, AMD measures, both soft and hard kill, will need to be developed, to counter the missile after it is fired. Another tactic is to fire different types of missiles at the same time, which confuses the adversary's air defence picture and facilitates a successful strike.

Way Forward

All this is easier said than done, but needs to be taken up in mission mode by the IN and the DRDO, as also in a collaborative mode with defence partners such as the QUAD countries. Hypersonic ASBMs are already a reality with the PLAN. China is the acknowledged global leader in hypersonic weapons and has also officially announced that it is at an advanced stage of development of even more capable hypersonic ASBMs. Consequently, the threat from such weapons is only going to increase and solutions to counter it need to be found in a time-bound manner. SP

Ballistic and Hypersonic Flight Trajectories



Source: GAO analysis Department of Defense

▷NEWS

Navantia's F-110 Programme Ahead of Schedule

NAVANTIA HAS STARTED THE construction process of the second frigate of the F-110 class for the Spanish Navy, thus confirming the speeding up of this programme valued at €4.325 million.The cut of the first steel of the F-112 took place on December 16, 2023 at Navantia's shipyard in Ferrol (A Coruña, Spain), in the presence of the President of the Spanish Government, Pedro Sánchez; the Fourth Vice-President of the Spanish Government and Minister of Finance and Public Function, María Jesús Montero; the President of SEPI, Belén Gualda and the President of Navantia, Ricardo Domínguez.

The programme -whose execution order was signed in 2019- foresees the construction of five frigates. The start of production of the F-112 is four months ahead of schedule, thanks to the high degree of maturity of the design and the progress of engineering work. The first frigate of the series, the F-111, under construction since 2022, has been also sped up and has gained momentum with a total of 24 out of the 33 blocks currently in various stages of construction and assembly.

The Spanish Navy's F-110 frigates are multi-purpose escort vessels, with anti-aircraft, anti-surface and anti-submarine capabilities that will enable them to perform their force protection and naval projection functions. These ships, which are intended to operate in combination with other units, make them versatile platforms that can perform maritime security-related functions. The design of this new frigate includes advanced technological features, such as an integrated mast with different sensor and antenna solutions, a multi-mission space that expands the ship's capabilities in all defence segments and a new hybrid propulsion plant, more efficient and silent, giving the ship great versatility. The frigates will be equipped with the Spanish combat system, SCOMBA, developed by Navantia Systems.

The F-110 frigate will be a smart ship, the first Spanish naval programme designed to have a Digital Twin: a virtual replica of the ship that constantly receives information from the vessel, data permanently supplied by a network of sensors distributed throughout the ship, constituting a cyber-physical system that through the use of behavioural models and technologies such as Cloud Computing, Machine Learning and the Internet of Things (IoT) allows to support its maintenance and operation even thousands of miles away through the Digital Twin deployed ashore. The F-110 will also have 3D printers on board for the manufacture of spare parts and will be the first ships in the fleet to have an integrated cybersecurity system to protect the vessels against increasing cyberthreats. SP

Publisher and Editor-in-Chief
Jayant Baranwal

Deputy Managing Editor
Neetu Dhulia

Principal Correspondent
Ayushee Chaudhary

Contributors

India
Admiral Sunil Lanba (Retd)
Vice Adm A.K. Chawla (Retd)
Vice Adm Shekhar Sinha (Retd)
Vice Adm K.N. Sushil (Retd)
Vice Adm Satish Soni (Retd)
Saloni Salil

Europe
Alan Peaford, Doug Richardson, Andrew Brookes (UK)

USA & Canada
Lon Nordeen (USA), Anil R. Pustam (West Indies)

West Asia/Africa
H.R. Heitman (S. Africa)

Chairman & Managing Director
Jayant Baranwal

Executive Vice President
(Planning & Business Development)
Rohit Goel

Manager – HR & Admin
Bharti Sharma

Deputy Manager – Circulation
Rimpy Nischal
circulation@spsnavalforces.com

Group Research Associate
Survi Massey

Design Team
Sr. Designer: Vimlesh Kumar Yadav
Designer: Sonu S. Bisht

Group Director – Sales & Marketing
Neetu Dhulia

Director – Sales
Rajeev Chugh

SP's Website
Sr. Web Developer: Shailendra Prakash Ashish
Web Developer: Ugrashen Vishwakarma

Published bimonthly by Jayant Baranwal on behalf of SP Guide Publications Pvt Ltd.

Printed in India
by Kala Jyothi Process Pvt Ltd

Subscription/ Circulation
Annual Inland: ₹600 • Overseas: US$180
E-mail: subscribe@spguidepublications.com
subscribe@spsnavalforces.com

Letters to the Editor
editor@spsnavalforces.com

For Advertising Details, Contact:
neetu@spguidepublications.com
rajeev.chugh@spguidepublications.com

SP GUIDE PUBLICATIONS PVT LTD

POSTAL ADDRESS
Corporate Office
A 133 Arjun Nagar, Opp Defence Colony,
New Delhi 110003, India
Tel: +91(11) 24644693, 24644763,
24658322
Fax: +91 (11) 24647093
E-mail: info@spguidepublications.com

Representative Office

MOSCOW, RUSSIA
LAGUK Co., Ltd, Yuri Laskin, Krasnokholmskaya, Nab.,
11/15, app. 132, Moscow 115172, Russia.
Tel: +7 (495) 911 2762,
Fax: +7 (495) 912 1260

www.spguidepublications.com
www.spsnavalforces.com

RNI Number: DELENG/2008/25836

SP GUIDE PUBLICATIONS

STRONG SUPPORT

ROSOBORONEXPORT
Russian Defence Export

more info at
ROE.RU/ENG/

27 Stromynka str., 107076,
Moscow, Russian Federation

E-mail: roe@roe.ru
www.roe.ru

Rosoboronexport is the sole state company in Russia authorized to export the full range of defense and dual-use products, technologies and services. Rosoboronexport accounts for over 85% of Russia's annual arms sales and maintains military-technical cooperation with over 100 countries worldwide.