



*The Sea our Strength*

# IMF SEMINAR 2023

12 OCTOBER 2023

at Central Park Hotel, Bund Garden, Pune

FOSTERING INNOVATION AND  
INDIGENISATION IN THE  
MARITIME DOMAIN



## Our Sponsors



# Concept Note

The maritime sector plays a vital role in the overall economic development of a country. Considering the long coastline of India of more than 7500 km and its important geostrategic location in the centre of the Indian Ocean, a strong maritime capability - both military and civil - is vital towards protecting our economic and security interests. It is even more vital to develop this capability through indigenous and innovative efforts.

The Indian Navy has long been at the forefront of indigenisation, having started over five decades ago with the design and construction of warships in the country. Today, almost 50 of its ships and submarines are under construction in Indian shipyards, both public and private. The Indian Navy has also launched a document, the "Indian Naval Indigenisation Plan (INIP) 2015-2030", to enunciate the need for developing various advanced systems for its platforms.

In the civil maritime domain, the story has not been as encouraging in the past in terms of indigenous shipbuilding and the induction of innovative technology. However, more recently, following the publication of the Maritime Vision 2030, there has been greater focus given towards the enhancement of our shipbuilding capability. Furthermore, the Government has also encouraged research and development of innovative technologies by startup MSMEs, private players such as L&T Defence as well as existing governmental agencies such as the DRDO.

Today, countries such as the US and China are at the forefront of innovation and the introduction of new technologies in the maritime domain - both civil and military. Digital platforms for ship and cargo tracking, as well as the implementation of digital communication and collaboration tools, have become commonplace in the industry. Navies too across the world are competing with each other in inducting potentially game-changing technologies such as Unmanned Autonomous Vessels, EMALS on carriers, electromagnetic rail guns as well as the gradual implementation of artificial intelligence and quantum computing into all aspects of naval warfare.

The seminar, therefore, is meant to examine the challenges facing innovation and indigenisation of the Indian Maritime sector, as well as brainstorm policies and reforms necessary to implement these in a time bound manner.

# About the IMF

The Indian Maritime Foundation (IMF) is a Pune based non-profit organization founded and run by a group of retired Indian Navy and Merchant Marine officers. The main objective of IMF is to promote awareness of the oceans and to rekindle maritime consciousness and pride among the people of India especially the youth. IMF is also committed to covering the developments in naval, geo-strategic, and merchant shipping, fisheries, as well as oceanographic and environmental fields.

The IMF's ambit of concern is wide-ranging; it has a holistic and all-embracing view of the oceans, which includes raising awareness about the activities of major stakeholders, such as the Indian Navy, the Indian Coast Guard, the mercantile marine and the fisheries; as well as diverse maritime interests such as shipping and ports, shipbuilding, hydrographic survey, oceanography, marine technology, and most importantly, the protection of our marine environment, on which the IMF has focused its attention extensively during the past ten years.

The IMF is registered in Pune as a charitable trust and has branches in Delhi, Mumbai and Chennai. The IMF publishes a quarterly journal, SEAGULL, containing various articles and news snippets on maritime issues across the world. We also undertake coastal and river clean-up drives periodically. A recent addition to the list of IMF projects that we are very proud of is the IMF Museum, Research Centre and Library at the Anantrao Pawar College of Engineering & Research, which has models, artefacts and books on maritime subjects.

# Programme

TIME	ITEM
0900-0928	Registration of Delegates.
0928	National Anthem
0930-0940	Welcome Address and Introduction of the Chief Guest by <b>Capt Anand Dixit, President IMF</b>
0940-0955	Inaugural Address by <b>Vice Admiral Vinod Pasricha PVSM AVSM NM, IN (Retd)</b>
0955- 1040	Keynote Address by <b>Vice Admiral Ajay Kochhar, AVSM NM, Commandant, National Defence Academy</b>
<b>1040- 1100 : TEA BREAK</b>	
<b>SESSION I : INNOVATION AND INDIGENISATION INITIATIVES IN THE INDIAN NAVY</b>	
1100-1105	Opening Remarks by Moderator <b>Vice Admiral Satish Ghormade, PVSM AVSM NM, IN (Retd)</b>
1105-1115	<b>RAdm IB Uthaiah, AVSM VSM, Director General Warship Design Bureau:</b> Fostering Indigenisation as an Enabler for Future Shipbuilding
1115-1125	<b>Cmde Arun Golaya, VSM, Director Technology Development and Acceleration Cell :</b> Naval Innovation and Indigenisation Organisation - Innovating towards Nation Building & 'SPRINTing' towards Atmanirbhar Bharat
1125-1135	<b>RAdm Iqbal Singh Grewal, Asst Chief of Materiel (Modernisation):</b> Leveraging Atmanirbhar Bharat - 2047: IN's Mission Indigenisation
1135-1145	<b>RAdm Ankur Sharma, NM, Director General, Weapons &amp; Electronics Systems Engineering Establishment:</b> Innovation & Indigenisation: The Naval Perspective
1145-1155	<b>Mr Nikunj Parashar, CEO M/s Sagar Defence Engineering:</b> Autonomous Maritime System - Progress, Methods and Challenges
1155-1225	Panel Discussion / Audience Q&A
1225-1230	Final Comments by Moderator <b>Vice Admiral Satish Ghormade, PVSM AVSM NM (Retd)</b>

# Programme

## SESSION II : INDUCTION OF NEW TECHNOLOGIES

1330-1335	Opening Remarks by Moderator <b>Mr S Ranganathan</b>
1335-1345	<b>Shri Madhu Nair, Chairman and Managing Director, Cochin Shipyard Ltd:</b> The Green and Tech transition in Shipping- Opportunities for India - The CSL experience.
1345-1355	<b>Dr Sauhard Singh, Chief Research Manager, IOCL:</b> Strategies for the Reduction of Emissions with New Technologies
1355-1405	<b>Cdr (Dr) Shekhar Murthy IN (Retd):</b> Thinking Ships: Revolutionary technologies to propel the future of Maritime Sector
1405-1415	<b>Shri Biju George, Director Shipbuilding Mazagaon Docks Ltd:</b> Indigenisation efforts at MDL- On the Road to Technological Self-Reliance
1415-1425	<b>Mr Koustubh Phalnikar, GM – Product Technology &amp; Development Centre (Defence &amp; Aerospace), L&amp;T Defence:</b> Mine Countermeasure using USVs
1425-1455	Panel Discussion / Audience Q&A
1455-1500	Final Comments by Moderator <b>Mr S Ranganathan</b>

1500-1515 : TEA BREAK

## SESSION III : OPPORTUNITIES, CHALLENGES AND THE WAY AHEAD

1515-1520	Remarks by Moderator <b>VAdm P Jaitly PVSM AVSM VSM, IN (Retd)</b>
1520-1530	<b>VAdm AK Chawla PVSM AVSM NM VSM PhD, (Retd):</b> Atmanirbharta Unbound
1530-1540	<b>Cmde (Dr) RK Rana (Retd):</b> Are We Doing Enough for Transitioning to Net Zero Carbon in Maritime Domain?
1540-1550	<b>Capt S Krishnamurthi:</b> Ship Voyage - Cost Vs Carbon...Can we Reduce Both?
1550-1600	<b>RAdm (Dr) PJ Rangachari, IN (Retd):</b> Applications of Analytical Techniques, Causal Modelling and AI in the Maritime Domain
1600-1610	<b>RAdm R Sreenivas VSM, IN (Retd):</b> Challenges and Ecosystem Imperatives for Comprehensive Self-Reliance in Defence - A Remedial Approach
1610-1640	Panel Discussion / Audience Q&A
1640-1645	Final Comments by Moderator <b>VAdm P Jaitly PVSM AVSM VSM, IN (Retd)</b>
1645-1700	<b>Cmde Ajay Sharma (Retd), Bharat Forge:</b> Futuristic Technologies and Roadmap for Indigenous Unmanned Systems (Land, Air & Naval Applications) - BFL Perspective
1700-1720	Concluding Remarks by <b>VAdm AK Chawla PVSM AVSM NM VSM PhD, (Retd)</b>
1720-1730	Vote of Thanks by <b>Cmde Ajay Chitnis SC NM(G), IN (Retd)</b>

# **Inaugural Session**

## **Welcome Address**

***Captain Anand Dixit***  
***President IMF***



## **Inaugural Address**

***Vice Admiral Vinod Pasricha***  
***PVSM AVSM NM, IN(Retd)***



## **Keynote Address**

***Vice Admiral Ajay Kochhar AVSM NM***  
***Commandant***  
***National Defence Academy***





**CAPTAIN ANAND DIXIT**  
**PRESIDENT, INDIAN MARITIME FOUNDATION**

**WELCOME ADDRESS**

Captain Anand Dixit, Master Mariner is an alumnus of Training Ship Dufferin (1958-60) and underwent active sea-service between 1960 to 2002. Between 1960 to 1978 he served the Shipping Corporation of India Ltd. He got his first command appointment in 1970. Between 1979 and 2002 he served with reputed foreign companies including Mosvolds-Farsund, Norway (and their subsidiary Mosvolds Asia Ltd, Hong Kong) as Master and Teekay Shipping (Canada) Ltd, Vancouver B.C. as Master.

The sea-service includes active participation in the cadets training programme of the Shipping Corporation of India and positions held ashore in senior technical/ operational capacities. His command experience includes command of General Cargo ships, Bulk Carriers, Tankers including VLCC of 276,000 DWT and 316,000 DWT, Gas carrier and FPSO. He also qualified as an accredited Lead Auditor for ISM Certification.

Post-retirement, Captain Dixit took up the job of a lecturer at Tolani Maritime Institute, Talegaon from 2004 to 2012. He has been working at the helm in the publication of the 'Seagull' magazine for 12 years, in important roles, first as the Associate Editor and then the Editor of the magazine.

He is a former Chairman of the Company of Master Mariners of India, Pune Chapter and a guest lecturer at Pune University (Dept of Defence and Strategic Studies) . He took over as the President of the Indian Maritime Foundation, Pune on the 07th January 2020.





**VICE ADMIRAL VINOD PASRICHA**  
**PVSM AVSM NM, IN (RETD)**

**INAUGURAL SPEAKER**

Vice Admiral Vinod Pasricha is a naval aviator. Commissioned in 1963, he soon went for flying training with the Airforce and graduated as a pilot on the Seahawk aircraft. He then spent a year at Ambala with the Indian Air Force flying Mystère aircraft. In 1971, he attended a Photo Reconnaissance Course at Lossiemouth in the UK on Hunters. Immediately thereafter, he was posted to INAS 300 (Seahawk jet fighters) on board INS Vikrant during the 1971 War, where he carried out many operational sorties over Bangladesh.

The Admiral has the distinction of commanding INS Katchall and INS Vindhyagiri, and was the commissioning Commanding Officer of the Indian Navy's second aircraft carrier, INS Viraat, which was commissioned at Plymouth.

In the Flag rank, he held many assignments including two aviation ones, Flag Officer Commanding Maharashtra Naval Area, Commandant of the National Defence College and Deputy Chief of Naval Staff. In Feb '98 he took over as the Flag Officer Commanding-in-Chief, Eastern Naval Command, followed by him being appointed as Flag Officer Commanding-in-Chief, Western Naval Command, thereby being amongst a select few who have commanded both the Indian Navy's two operational commands. The Admiral retired in 2002.

In addition to his naval activities, he set up some naval museums, of which the Aviation Museum at Goa and the Submarine Museum at Visakhapatnam are big tourist attractions today! Unfortunately, INS Vikrant, which was also made into a museum, was scrapped a few years later. Post-retirement, the Admiral settled down in Pune where he is an active member of the IMF.







**VICE ADMIRAL AJAY KOCHHAR, AVSM NM  
COMMANDANT, NATIONAL DEFENCE ACADEMY**

**KEYNOTE SPEAKER**

Vice Admiral Ajay Kochhar is an alumnus of the National Defence Academy Khadakwasla, the Defence Service Staff College, Wellington, Naval War College, Mumbai and the Royal College of Defence Studies (RCDS) at the United Kingdom. In a career spanning 35 Years, he has held a number of specialist, staff and operational appointments, both afloat and ashore.

He was commissioned in the Indian Navy on 01 Jul 88. Consequent to earning his Watchkeeping Certificate on board INS Ranvijay, he undertook his first appointment as Executive Officer of LCU L-36, following which he was selected to commission a missile corvette INS Vipul as the ship's Navigating Officer.

After completing his specialisation course in Gunnery and Missiles, he did four back-to-back appointments as Missile/ Gunnery Officer on board frontline ships of the Eastern/ Western Fleet: INS Rajput, INS Kirpan, INS Ranjit and INS Ranvijay. He was appointed as Executive Officer of INS Veer a Missile Corvette and subsequently commanded INS Nashak and Vibhuti - both also Missile Corvettes.

After doing his Staff Course at Wellington, he was appointed as Joint Director Naval Plans at the Integrated Headquarters of Ministry of Defence (Navy). On completion of this tenure, he was appointed as Executive Officer of the missile destroyer INS Rana and thereafter Commanding Officer of the Missile Corvette, INS Kirpan. Following his sea tenure he worked as Director of Staff Requirements at IHQ MOD (Navy). He subsequently had the privilege and the opportunity of commissioning INS Trikand - a missile frigate of project 1135.6 at Kaliningrad Russia as its Commanding Officer.

Following his RCDS course, in which he distinguished himself by winning the award for best Country/Area Strategic Analysis studies, he was appointed as Naval Assistant to the Chief of Naval Staff and thereafter, assumed the command of Indian Navy's aircraft carrier INS Vikramaditya on 03 Apr 17, remaining at the helm till 26 May 18. During his tenure, the ship was awarded the Best Fleet Ship trophy for the year 2017-18, besides winning the Fleet Regatta (Cock Ship) and being adjudged the Runner Up in the CNS Rolling Trophy for Innovation (2017).

On promotion to Flag Rank, he was appointed as Assistant Controller of Carrier Projects & Assistant Controller of Warships production & Acquisition wherein he steered multiple vital naval shipbuilding projects.

The Admiral assumed Command of the Western Fleet on 24 Feb 21. As the Fleet Commander of 'The Sword Arm' he enhanced the Western Fleet's anti-piracy presence in the Gulf of Aden, Mission-based Deployments in the Gulf of Oman, IMBL patrols, Flag- showing Missions, Bilateral exercises/ PASSEXs and undertook critical operational missions such as Op Samudra Setu II and SAR Operations during Cyclone 'Tauktae.'

For rendering distinguished service of an exceptional order in keeping with the highest traditions of the Service, the Flag officer was awarded Nausena Medal in the year 2013 and 'Ati Vishisht Seva Medal' by the President on 26 Jan 22. He has also been Commended by FOCINC (W) in 2000 during his tenure as EXO, INS Veer and by the CNS in 2003 during his tenure as CO, INS Vibhuti.

He is married to Mrs Reyman Kochhar, who has earlier worked in advertising and also been a teacher. The couple have a daughter Sabah and son Karan



# **Session I**

## **Innovation And Indigenisation Initiatives In The Indian Navy (1100-1230 Hrs)**

### **Moderator**

**VAdm Satish Ghormade  
PVSM AVSM NM, IN (retd)**

### **Panelists**

**Radm IB Uthaiyah, AVSM VSM  
Director General, Warship Design Bureau**

**Cmde Arun Golaya, VSM  
Director, Technology Development and  
Acceleration Cell**

**RAdm Iqbal Singh Grewal  
Asst Chief of Materiel (Modernisation)**

**RAdm Ankur Sharma, NM  
Director General, Weapons & Electronics  
Systems Engineering Establishment**

**Mr Nikunj Parashar  
CEO M/s Sagar Defence Engineering**



## **VICE ADMIRAL SN GHORMADE, PVSM, AVSM, NM, IN (RETD)** **MODERATOR - SESSION 1**

VAdm SN Ghormade, PVSM, AVSM, NM, ADC (Retd), a Navigation and Direction Specialist was commissioned into the Indian Navy on 01 Jan 1984. He is a graduate of the National Defence Academy (NDA), Khadakwasla, Naval Staff College at the United States Naval War College, Newport, Rhode Island, and the Naval War College, Mumbai.

He is the recipient of the Best Naval Cadet Gold Medal, V Adm AK Chatterjee Trophy, Capt BD Naidu Shield at the NDA, the 'Binoculars' for Best All Round Cadet, first in Seamanship and Electrical Engineering in Cadet Training Ship INS Mysore, overall first in merit in the course at the end of Sub Lt Technical courses (Admiral Katari Trophy), overall second in the Navigation and Direction Specialisation course, Distinction in United States Naval Staff College at Naval War College, Rhode Island, and the C-in-C Silver Medal in the Naval Higher Command Course at Naval War College.

The Admiral significantly contributed towards creation and sustenance of combat ready, credible, cohesive and future proof Navy through focused impetus on integrated planning, innovation, indigenization, infrastructure development, management of allocated fiscal resources and adopting emerging technologies. He worked on the road map of Theaterisation of Armed Forces with emphasis on Tri-service synergy, jointmanship and integrated planning. The Navy has been in the forefront of Atmanirbharta and the Flag Officer gave impetus to the Atmanirbhar initiatives with dedicated efforts to encourage Indian industry along with DRDO. Sustained impetus on indigenisation has resulted in continuous increase in indigenous content in the Naval ships. Further, Indian Navy had effectively utilised 'Make' and 'iDEX' route to achieve the objective of self-reliance by involving greater participation of Indian industrial eco-system including Private Sector. Under his supervision, Indian Navy propelled towards induction of more than 75 game changer technologies/products through SPRINT challenges.

Some of his major achievements are as follows:-

- He formulated, laid down the Road map & steered Navy's Maritime Capability Perspective Plans (2005-2022 & 2022-2037) achieving record growth & modernization and planned to build an indigenous, potent and powerful Blue water Navy (Ships, submarines, aircraft) by capability, tonnage and numbers including infrastructure.

- He formulated the Indian Navy Strategic Communication Guidebook and set up the Strategic Communication Committee of the Navy to pursue information operations, perception management, public diplomacy, and progress actions to enhance public awareness of Indian Navy.
- He spearheaded and guided the efforts for commissioning of First indigenous aircraft carrier INS Vikrant catapulting India into the elite list of countries building and operating indigenous Aircraft Carriers.
- He enhanced Indian Navy's presence and readiness in the Indian Ocean Region by proactive and strategic Mission Based Deployment and streamlined the Maintenance, Training, Operations and Deployment Cycle.
- He foresaw the need for Underwater Domain Awareness for Theatre level Anti-submarine Warfare. Envisioned the setting up of Information Fusion Centre for Indian Ocean region, to make India a leader in domain awareness in IOR.
- He formulated the first Human Capital Strategy of the Navy in tandem with future capability perspective plan, enhancing transparency, timely recruitment, enhancing motivation and trust of over 11000 officers and 65000 sailors thus transforming the HR management.

## **PRESIDENT'S MEDALS**

- Param Vishisht Seva Medal (PVSM)-2022
- Ati Vishist Seva Medal (AVSM)-2017
- Nau Sena Medal (NM)-2007

## **ACADEMIC QUALIFICATIONS**

- MSc Defence and Strategic Studies, University of Madras
- Masters (Personnel Management), Symbiosis Institute of Management
- M Phil (Defence & Strategic Studies), Mumbai University

## **KEY POSITIONS HELD**

- Vice Chief of the Naval Staff, Indian Navy
- Deputy Chief of Integrated Defence Staff (Operations & Training)
- Chief of Staff, Eastern Naval Command
- Director General Naval Operations
- Flag Officer Commanding Maharashtra Naval Area





**RADM IB UTHAIAH, AVSM VSM**  
**Director General, Warship Design Bureau**

**PANELIST - SESSION I**

Commissioned into the Indian Navy in Nov 1987, Rear Admiral IB Uthaiyah, AVSM, VSM, is from the first batch of the Naval Engineering Course. In his career spanning over 36 years, he has served the Indian Navy in various capacities; with appointments at the Warship Design Bureau, Training Academies, Naval Dockyard (Vzg), all Commands and the Naval Headquarters.

Graduating with a B. Tech in Marine Engineering from the Naval College of Engineering at INS Shivaji, Lonavala, he holds an M. Tech and M. Phil post graduate degree in addition. His key Staff appointments cover areas of Warship Design, Overseeing & Repair, Warship Acquisition & Contracting, Officer Training and management of mega Marine and Civil infrastructure projects.

His key senior appointments in operations and staff include, General Manager (Refit) at Naval Dockyard, Visakhapatnam and Principal Director (Ship Production). On being appointed to Flag rank, he has tenanted appointments as ADG(Tech)/Seabird, ASD (Vzg), CSO(Tech)/ENC and is presently appointed as the Director General Warship Design Bureau.

An alumnus of the Naval War College, he was awarded the AVSM and VSM, for distinguished service at Naval Dockyard, Visakhapatnam. His hobbies include travelling, photography, gardening and cycling. The Admiral and his wife are blessed with two children.



# **Fostering Indigenisation as an Enabler for Future Shipbuilding**

**BY RADM IB UTHAIAH, AVSM VSM**

## **ABSTRACT OF TALK**

The Indian Navy has a long-standing commitment to indigenous design and construction of its warships, predating the government's 'Make in India' and Aatmanirbharta initiatives. Design and Construction of latest state of art Warships including Aircraft Carrier has been completed indigenized. However, complete indigenization of its contents like Weapons and Sensors, Main Propulsion System etc. of warships has been a challenge due to the technology gap or the cost competitiveness of Indian vendors compared to foreign OEMs. To become self-reliant, the focus area of the Navy and the entire defense eco-system should be towards bridging this gap towards complete self-reliant. The country has witnessed significant technological advancements in recent times and can leverage technological tools such as AI, ML and digital twin for more efficient and faster shipbuilding. This paper aims to highlight areas affected by policy-level initiatives and provide suggestions for creating a roadmap for achieving self-reliance through technological advancements in future shipbuilding.





**CMDE ARUN GOLAYA, VSM, OFFICER IN CHARGE  
TECHNOLOGY DEVELOPMENT ACCELERATION CELL**

**PANELIST - SESSION I**

Commodore Arun Pratap Golaya is an alumnus of the National Defence Academy and was commissioned in the Indian Navy on 01 January 1992, The officer specialised in navigation, aircraft direction and naval operations. In addition to serving afloat in frontline warships as the Navigating Officer, he had held a number of important appointments ashore. These include Joint Director Net Centric Operations at IHQ MoD (Navy) and a tenure in the planning staff at Command Headquarters. The officer has commanded three ships including one on deputation to the Coast Guard.

During his command of the Diving Support Ship, INS Nireekshak, the ship was awarded the coveted 'Unit Citation'. In 2012, the officer was awarded the Vishisht Seva Medal (VSM) for distinguished service by the President of India. He has also been awarded Commendations by the Chief of Naval Staff and the Flag Officer Commanding in Chief, Southern Naval Command.

A keen writer and analyst, he did a short tenure as a Research Fellow at the National Maritime Foundation prior to taking up an extended 8-year assignment as the National Defence Specialist in the Secretariat (NSCS), including in Technology Wing at NSCS. His published work includes The Game Changer, a primer on the use of Game Theory for Low Intensity Maritime Operations (Written under the aegis of the Admiral AK Chatterji Research Fellowship awarded by the National Maritime Foundation) and The Admiral Who Shed His Vice, an anecdotal biography of Adm Chatterji in addition to numerous articles on diverse issues. The officer has completed his doctoral studies from TERI School of Advanced Studies.

A number of Patent applications have been filed by the Indian Navy where the officer is the inventor, with the most promising one being a ship detection methodology for enhancing MDA (Maritime Domain Awareness).

He is currently appointed as the Officer in Charge, Technology Development Acceleration Cell (TDAC) under the newly created Naval Innovation and Indigenisation Organisation (NIIO). He has been bestowed the honorary designation of Chief Advisor Defence Innovation by Rashtriya Raksha University, Gandhinagar.





**RADM IQBAL SINGH GREWAL**  
**ASST CHIEF OF MATERIEL (MODERNISATION)**  
**PANELIST - SESSION I**

Rear Admiral Iqbal Singh Grewal hails from a family with a distinguished tradition of serving in the armed forces, dating back to pre-independence India. His lineage boasts of a remarkable heritage, with his great-grandfather being the first Indian ADC to the Commander-in-Chief in 1912, earning the prestigious title of Bahadur and even receiving an invitation to the coronation of King George V in England. Following in these illustrious footsteps, his father, Col Bhag Singh, VSM, retired from the Army Ordnance Corps in 1996 as a Brigadier. A highly decorated soldier, his father actively participated in the 1971 war and Jaffna operations, represented Services in Volleyball, and was a qualified international referee in Volleyball who represented India as an official in the 1982 Asian Games at Delhi and 1986 Asian Games at Seoul (South Korea).

RAdm Grewal joined the Indian Navy in 1991. He has served aboard various ships, earning a unique distinction by operating on all three streams of propulsion warships: Steam, Diesel, and Gas Turbine. Notably, during his tenure as Engineer Officer on INS Gomati, he led the groundbreaking Mid Life Upgradation process, setting new records and achieving numerous milestones. His valuable expertise extended to both the Naval Dockyards, Visakhapatnam and Mumbai, where he left an indelible mark.

Throughout his distinguished career, he has held several pivotal roles, including Fleet Engineer Officer at HQ Western Fleet, Officer-in-Charge of Fleet Maintenance Unit in Mumbai, and Commodore Superintendent of the Naval Ship Repair Yard in Port Blair. Under his adept leadership, NSRY Port Blair received the coveted Unit Citation for the year 2020-21. As the Principal Director of Civilian Personnel, he revolutionized civilian personnel management, securing government sanction to extend Cashless Medical Facility to naval civilians and all defence civilians under Ministry of Defence. He also spearheaded the revival of 116 Group 'A' and 'B' posts, contributing significantly to workforce development.

His tenure at Project Seabird was marked by his unwavering commitment to completing various critical marine facilities, including Pier 5 for Aircraft Carriers. Presently, Rear Admiral Grewal wears multiple hats, serving as ACOM (Mod) and Director General of Naval Trials and Acceptance Authority. He has diligently guided the Indian Navy towards self-reliance by 2047 and overseen the technical infrastructure development essential to achieve this goal. Furthermore, as DG NATAA, he bears the responsibility of conducting trials for Indian Navy ships and submarines, both in-service and newly constructed, ensuring impeccable performance.

# **LEVERAGING ATMANIRBHAR BHARAT - 2047: IN'S MISSION INDIGENISATION**

**by RADM IQBAL SINGH GREWAL, ACOM (MODERNISATION)**

## **ABSTRACT OF TALK**

In response to the resounding call by the Hon'ble Prime Minister for Atmanirbhar Bharat Abhiyaan (Self-Reliant India campaign), the Indian Navy (IN) has embarked on a transformative mission to achieve self-reliance, or Atmanirbhar Bharat, by 2047. This commitment necessitates aligning strategies and policies to drive indigenous innovation. The paper explains how IN is harnessing Make-in-India initiatives including Make, Technology Development Fund (TDF), and Innovation for Defence Excellence (IDEX) schemes, to foster indigenisation across crucial technology domains.

**Long-Term Vision and Enablers.** IN is providing vital visibility to indigenous industries through visionary documents like "The Integrated Unmanned Roadmaps for IN," "Swavlamban - IN's Indigenisation Plan," and the "Technological Perspective Capability Roadmap." The paper sheds light on these strategic roadmaps that facilitate design and development by indigenous industries. Over 450 items earmarked for indigenisation within the next few years are listed on the 'Srijandefence' portal. Furthermore, Indigenisation Roadmaps and Rollon-Plans for equipment/systems onboard key import platforms, such as Aircraft Carrier Vikramaditya, Talwar Class ships, P-75 submarines, and Tankers, underscore IN's dedication to self-reliance.

**Empowering Indigenous Innovation.** The paper dives into IN's proactive engagement with the Government of India's Makein-India initiatives, detailing the strides made under Make I, IDEX, and TDF schemes. Advanced-stage contracting for numerous projects, involvement of 60 startups under IDEX, and progress on 25 projects under TDF exemplify IN's commitment to nurturing indigenous development. By embracing Gol's directives of import substitution, IN is spearheading the creation of indigenous equipment and systems through the Revenue route. The transformative measures introduced by MoD/DDP in DAP 20 have streamlined procurement and reduced timelines. The imminent revision of DPM and the formulation of Defence Indigenisation Procedures (DIP) promise groundbreaking changes in Revenue design and development cases.

**Collaborative Synergy and Catalyst for Growth.** The paper highlights IN's vibrant engagement with over 200 MSMEs/start-ups, fostering innovative projects aligned with niche defence technologies. Through the establishment of the Centre for Indigenisation and Self-Reliance (CISR) at Coimbatore's Defence Industrial Corridor (DIC), IN is propelling the growth of private domestic manufacturers. Functioning since April 2021, CISR serves as an umbrella organization, orchestrating interactions with industrial corridors to meet IN's indigenisation needs holistically – from 'Conceptualisation to Trials and Induction.'

**Conclusion.** In essence, the paper illuminates IN's steadfast commitment to realizing the dream of an Atmanirbhar Bharat. By capitalizing on national initiatives, fostering indigenous innovation, and fostering collaborative synergy, the IN is advancing towards selfreliance with resolute determination.



**RADM ANKUR SHARMA, NM**  
**DIRECTOR GENERAL, WEAPONS & ELECTRONICS SYSTEMS**  
**ENGINEERING ESTABLISHMENT**

**PANELIST - SESSION I**

Rear Admiral Ankur Sharma NM was commissioned into the Indian Navy in Aug 1989. The officer is a graduate in BE (Electrical) and has pursued his post-graduation in MBA (IT) from Jamnalal Bajaj Institute of Management Sciences. He is an alumnus of National Defence College, where he pursued his M.Phil (Defence Strategic Studies). The officer is presently appointed as Director General, Weapons & Electronics Systems Engineering Establishment, WESEE.

During his 33-year naval career, the officer has accumulated a rich experience through varied appointments in the field of maintenance of maritime systems, Research, and Development. He has served onboard numerous frontline Warships, design agencies, and Naval Dockyards. His present areas of interest include the adaptation of futuristic technologies to the maritime domain and synergising commercial cutting-edge technologies to battlefield applications. His current work relates to the induction of emerging technologies in the field of Weapon and Electronic Systems into the Indian Navy.



# **INNOVATION & INDIGENISATION: THE NAVAL PERSPECTIVE**

## **by RADM ANKUR SHARMA, NM, DG WESEE**

### **ABSTRACT OF TALK**

Indigenisation and innovation are the cornerstones to *atmanirbharata*. Self-reliance in the field of critical technologies is essential to gain and retain the edge in modern day warfare. Utilisation and employment of cutting edge technologies gives the edge over the adversary. Adaption of commercial technologies and dual use technologies for usecases specific to the maritime domain holds the key for rapid prototyping and quick time deployment.

The Indian Navy has been quick to learn the ropes and invest in indigenisation and be the forefront of *atmanirbharata*. The induction of indigenous aircraft carrier INS Vikrant and P-75 class submarines are massive steps in indigenous shipbuilding programmes. The homegrown Platform Level Warship integration, Combat Management Systems and Datalink programmes steered by WESEE are a testimony to the foresight and belief in indigenous ability. The Indian Navy has nurtured a culture of innovation and mandated specialist institutions to investigate, try and introduce futuristic cutting edge technologies which would define the landscape of the future warfare.

The panelist would deliver a presentation bringing out the efforts of WESEE and the Indian Navy towards assimilation of such cutting edge futuristic technologies for deployment in the battlefield.





**MR NIKUNJ PARASHAR**  
**CEO M/S SAGAR DEFENCE ENGINEERING**

**PANELIST - SESSION I**

Capt. Nikunj Parashar a Merchant Mariner and an Alumni of IIM's Ahmedabad is the CEO and founder of Sagar Defence Engineering Pvt Ltd, India and Oceanos BV, Rotterdam, Netherlands; which has recently been awarded with the National Award, in Jan 2022 in the robotics sector by DPIIT by Govt of India and by National Security Guard in Sep 2022 under aegis of MHA for developing countermeasures for IEDs. He holds a number of patents to his name for developing electronic and wireless charging systems for unmanned systems. With over 14 years of experience in shipping operations, ship construction, cargo and port operations, along with safety Management. His impressive education qualifications include Bachelors in Nautical Technology, Masters in (F.G.) – India, Chief Mate (F.G.) – India and a course on Clean-tech from Indian School of Business, Hyderabad.

He has represented India at Los Angeles for clean tech program under the aegis of Ministry of MSME, at the Hague as one of the leading entrepreneurs from India for robotics, at SLUSH conference Helsinki in robotics and recently at Vivatech 2022, Paris where India was selected as the country of the year once again for robotics.

He has also presented technical papers in India as well as abroad on:-

- Autonomous Shipping at Rotterdam at Haven Congress on Shipping in Apr 2017.
- Unmanned Systems at CII International Seminar in Sep 2016
- Unmanned Aerial Vehicles at CII International Conference on in Oct 2015.

He has been bestowed with numerous awards, appreciations, and accolades and has an impressive portfolio for which he has received immense appreciation from renowned and celebrated institutions not just in India but also abroad. Mr. Parashar has represented India on multiple occasions internationally.

Some of the major awards that he has been conferred with are as follows:

- Jan 2022: NASSCOM League of 10 (ten) top hyper growth startup of the country.
- Jan 2022: National start-up Award by the Government of India.
- Dec 2021: NASSCOM Deeptech start-up club.
- Dec 2021: 8th Int'l Sagar Manthan Technology Provider of the Year award for 2021.
- Sep 2021: Dare to Dream 2.0 award by DRDO with a cash Prize of INR 10 Lac.
- Feb 2021: Single IDEX winner for development of Autonomous Underwater Swarm Drones with a grant of INR 1.5 Cr from MoD.
- Feb 2019: Winner of Surveillance Fixed VTOL category in Drone Olympics hosted by AERO INDIA 2019 show
- Feb 2019: Second in supply drop challenge in in Drone Olympics hosted by AERO INDIA 2019 show
- Feb 2019: Most Innovative Startup 2019 by NASSCOM National Technology and Leadership Forum 2019
- Dec 2018: Selected by Govt of A.P to represent India at Slush 2018, Helsinki, Finland
- Sep 2018: Best Electronics manufacturing Company in A&D in Spactronics
- Deftronics Awards 2018 by IESA
- June 2018 : Top 24 Startups in the Maharashtra Startup Week and Signed
- LOI with Govt of Maharashtra
- June 2018 : Grant from Netherlands government
- April 2018 : Selected for accelerator batch by 36INC and for Chattisgarh State fund under LoFR fund (Debt Fund) 40 Lakhs.
- Feb 2018: Best 6 Startups in Magnetic Maharashtra 2018 by Hon'ble CM Maharashtra.
- Jan 2018: Selected by Devpt Commissioner, Ministry of MSME , GOI, to represent India at Cleantech Open 2018 Global Forum, Los Angeles, USA
- Dec 2017: Awarded 3rd prize at the Jai Hind Entrepreneurship Summit 2017.
- Dec 2017: Top 4 finalists of Global Cleantech Innovation Programme
- Aug 2017: Most promising Startup in Aerospace and Defence by
- IESA Deftronics Awards 2017
- June 2017: Winners of disruptive technology by IC2 Lab, Univ of Texas, Austin, USA.
- Feb 2017: Most promising Startup by IESA Technovation Awards 2017
- Feb 2017: Selected for second cohort of XLr8 A.P. Technology Business Accelerator
- Feb 2017: Top 10 Maritime Startups in PORTXL- World Port Accelerator at Rotterdam.
- Apr 2016: Best Maritime Start by Government of India & Shipping Ministry
- Apr 2016: Best Maritime start up by Audience Poll during Maritime India Summit 2016
- Apr 2016: Grant from CIIE, IIM (Ahmedabad) and selected as the top ten start up by
- Economic Times in Power of Ideas contest out of 19000 startups
- Oct 2015: Electropreneur Park as one of the top startup in ESDM sector



# **AUTONOMOUS MARITIME SYSTEM - PROGRESS, METHODS AND CHALLENGES**

**by MR NIKUNJ PARASHAR**

## **ABSTRACT OF TALK**

Autonomous Maritime Systems are the future of maritime technology as they enhance safety, reduce cost, time and preserve human lives. These systems operate in adverse conditions without fatigue, improving maritime safety by optimizing routes and operations to minimize emissions and expenses, making them environmentally friendly and cost-effective. They extend access to remote areas, extending military reach to remote and hostile areas, facilitating surveillance, reconnaissance, and strategic data collection along with facilitating data collection for research and commercial purposes.

By the integration of autonomous technology with maritime platforms, they not just have applications for the armed forces but also for disaster response, cargo transportation, and marine research, further promising transformative advances in the maritime industry's efficiency and sustainability.

In recent years, maritime autonomous systems have made remarkable strides, revolutionizing both military and commercial sectors, featuring advanced sensors like radar, sonar, and cameras for enhanced situational awareness and operational efficiency. In the military realm, they also have stealth capabilities, contributing to enhanced naval operations, including mine countermeasures, anti-submarine warfare, and intelligence gathering. Commercially, they have proven invaluable in hydrographic surveys, research, and bathymetric assessments by efficiently collecting data, mapping underwater terrain, and monitoring marine environments, offering cost-effective and environmentally friendly solutions. Their adaptability and integration with emerging technologies like artificial intelligence make them versatile tools for scientific exploration, environmental monitoring, and offshore industries.

However, safety and regulatory compliance have become a challenge in the practical use of such systems, as they must comply with maritime laws while operating along with navigating congested or unpredictable maritime environments that may pose obstacles.

Finally, international coordination and standardization efforts and regulatory compliances need to be updated to ensure the seamless integration of autonomous maritime systems into global maritime operations while addressing present regulation requirements.



# **Session II**

**Induction Of New Technologies  
(1330-1500 Hrs)**

## **Moderator**

**Mr S Ranganathan**

**Executive Vice President, L&T Defence**

## **Panelists**

**Shri Madhu Nair**

**Chairman and Managing Director, CSL**

**Dr Sauhard Singh**

**Chief Research Manager, IOCL**

**Cdr (Dr) Shekhar Murthy IN (Retd)**

**Shri Biju George**

**Director Shipbuilding, MDL**

**Mr Koustubh Phalnikar**

**L&T Defence**





## **SHRI S RANGANATHAN, EXEC VP, L&T DEFENCE**

### **MODERATOR - SESSION II**

.Mr S Ranganathan graduated in Electrical & Electronics Engineering from Birla Institute of Technology & Science, Pilani (Rajasthan, India). He joined L&T as a Graduate Engineer Trainee (GET) in 1983. Since then, he has had over four decades of varied & rich experience at L&T.

With L&T's foray into the Defence Business, he took on the role of business development in the domestic defence segment, and was part of the team that grew the business from initial phase. In 2006, he took over as the Head of Weapon Systems Business, with responsibilities including Profit & Loss (P&L), Business Development, and Contracts & Programme Management.

Mr Ranganathan currently is responsible, besides Weapon & Engineering Systems Business, for the Defence Business Corporate Centre, which includes Strategic Planning, IT, Legal, EHS (Environment, Health, and Safety), CSR & Sustainability, and Plant Engineering functions. He's also a Member of the Board of L&T Defence. He continues to contribute to Talent acquisition, and nurtures mentoring of personnel across the DEFENCE IC.

Mr. Ranganathan has been groomed to the Top management position through numerous inhouse Executive Development programs as well as through Management Development & Leadership Programs, including:

- Administrative Staff College of India's Middle Management Level Program
- Lal Bahadur Shastri National Academy of Administration (LBSNAA) Joint Civil-Military Programme on National Security
- Michigan Ross School of Business Global Leadership Programme
- INSEAD Programme on Transforming L&T into a Global Corporation
- Global CEO programme conducted by Harvard Business School
- Senior Executive Programme at London Business School

Mr Ranganathan is happily married, and is blessed with a daughter and a son. In his leisure time, he likes to read books and solve crosswords. He is an avid walker, and has completed thirty half-marathons.



**SHRI MADHU NAIR, CHAIRMAN AND MANAGING DIRECTOR,  
COCHIN SHIPYARD LTD  
PANELIST - SESSION II**

Madhu S Nair took over as the Chairman & Managing Director of Cochin Shipyard on 01 January 2016. Under his leadership, CSL became a listed company after a very successful IPO and is presently undertaking two major expansion projects – a new 310m drydock and a 6000T shiplift and 6 workstations based Shiprepair yard - worth Rs.3000 crores in Kochi.

He has helmed the affairs at CSL during the critical outfitting, testing, commissioning and trials of India's first Indigenous Aircraft Carrier, INS Vikrant, leading to its successful commissioning into the Indian Navy on 02 Sep 22 by the Hon'ble Prime Minister of India.

He has led the shipbuilding and shirepair aspects in the Maritime India Vision 2030 document of the Govt of India, has been leading efforts in the Green Shipping areas and has been instrumental in creating India's first National Centre of Excellence for Green Ports and Shipping (NCoEGPS) at TERI, Gurugram, and has guided CSL's Maritime Start Up funding program "USHUS". CSL under his leadership has forayed into building India's first Hydrogen fuel cell vessel and into various Electric/Hybrid Vessel initiatives.

CSL has forayed into the Inland waterways transport vessel segment and through its fully owned subsidiary shipyard, Hooghly Cochin Shipyard Ltd (HCSL), has constructed a new shipyard with an investment of Rs.180 crores at Kolkata. Further, in line with his focus on development of a dedicated shipyard for construction of small & medium Naval Vessels and specialized crafts including fishing, inland & coastal vessels, CSL has taken over the TEBMA shipyards at Malpe, near Udupi in Karnataka, through the NCLT Resolution process, which now a fully owned subsidiary of CSL and is named as Udupi Cochin Shipyard Ltd (UCSL)

CSL under his leadership has also forged alliances with Major Port Trusts and dockyards in India for improving the Shiprepair ecosystem in the country. Thus, CSL has set up Ship Repair Units (SRU's) for providing professional Ship Repair services at Mumbai Port Trust (CMSRU), Kolkata Port Trust (CKSRU) and at Port Blair, Andaman & Nicobar (CANSRU) in addition to the Kochi shipyard.

Thus, from only a single unit at Kochi in 2015 CSL today has 7 units (Kochi -2 units, Kolkata -2 units, Mumbai, Malpe, and Port Blair) spread over the country.

Under his guidance and in spirit with 'Atmanirbhar Bharat' initiatives and 'Make in India Make for the World', themes CSL has forged partnerships with leading international firms like IHC Holland, Fincantieri Italy, Robert Allan Canada have secured major orders for European Short sea Ships, Wind Field Support Vessels and building large dredgers in India.

He has 35 years of professional experience with Cochin Shipyard Ltd since joining as Executive trainee in June 1988 in the entire gamut of shipyard management. He was the key driver in forging alliances with international technology partners during CSL's international business forays. He is a strong believer in power of people and the "people first policy" conceived by him and various actions in this regard are aimed at steering CSL into a knowledge organization. Under his leadership CSL has undertaken a deep dive Strategic vision exercise 'CRUISE 2030' and have now created the new Strategic & Advanced Solutions Division in CSL to make sure the company is future ready.

He holds a Masters in Engineering (Naval Architecture and Ocean Engineering) degree from Osaka University, Japan, and BTech (Naval Architecture and Ship Building) degree in first class from Cochin University of Science & Technology.

He is trained in shipbuilding systems at IHI Shipyard at Kure, Japan, and undergone JICA Specialized training at Overseas Vocational Training Centre (OVTA), Tokyo and Osaka International Centre, Osaka, Japan and did research in Joining & Welding Research Institute, during Masters in Engineering at Osaka University, Japan, with Japanese Govt Scholarship during 1999-2002.

He is the Fellow of The Royal Institution of Naval Architects, UK, and Fellow of Institution of Naval Architects, India. He is also at present the President of the Indo Japan Chamber of Commerce, Kerala.

He is the winner of CUSAT Distinguished Alumni Award 2022, Samudra Manthan Prof K R Bhandarkar Award 2022, Rotary Icon 2023 Award and Pride of KMA Award.

He is a native of Guruvayur, Kerala. His wife Mrs K Rameetha is an MTech (Computer Science) working as Scientist 'G'-Associate Director, with NPOL, DRDO, Kochi. His daughter Parvathi Madhu Nair is a MTech & BTech (Dual Degree) from IIT Madras, presently working with PayGlocal, Bangalore, and son Krishnan Madhu Nair is studying in Class-XI in Naipunnaya Public School, Thrikkakara.





**DR SAUHARD SINGH**  
**CHIEF RESEARCH MANAGER, IOCL**

## **PANELIST - SESSION II**

Dr Sauhard Singh has more than 20 years of expertise in the field of engine testing, evaluation of conventional & alternate fuels CNG, HCNG, Hydrogen, LNG, DME, Oxygenated Fuels (ED5/MD15) etc. for automotive application. He has done collaborative work with leading OEMs of India – Wartsila, TATA, Ashok Leyland, Mahindra, Maruti, Volvo Eicher, JCB etc. He also has extensive exposure on design, execution and management of hydrogen dispensing stations.

During his career, Dr Singh has several achievements to his credit and won various awards. He has won the Innovation Award 2021-22 by Ministry of Petroleum & Natural Gas for, “Green Combo Solution (green Diesel & Green Lubricants) for Heavy Duty Commercial Vehicle Fleet Management.” He is the Special Correspondent of IOC R&D house journal, “Urja Anusandhan”. He has 40 Research publications in national/international journals. He is the Treasurer of CIMAC INDIA, Member of Society of Automotive Engineers.

His academic achievements include a Ph. D. in Energy Science & Engineering from Indian Institute of Technology, Delhi.





***CDR (DR) SHEKHAR MURTHY, IN (RETD)***

## **PANELIST - SESSION II**

Commander (Dr.) Shekhar Murthy is a Thought Leader and Institution Builder with over forty years of professional experience including leadership at the CXO level. Spanning diverse sectors and domains of work that include, defence, engineering, software, R&D, geospatial sciences, and academia, the author has a vast repertoire of distilled professional wisdom tested and tuned in a battle-hardened environment and corporate global competition. Alumnus of institutes of eminence the Indian Institute of Technology, Kharagpur; Birla Institute of Science & Technology, Pilani; North Orissa University; U-21 Singapore and Harvard Publication, Indira Gandhi National Open University, the author has to his credit over thirty-five research and technical papers and two books. The author's doctoral dissertation was titled, "Building effective learning strategies for the 21st century: Development of framework to implement "Academagogy" in higher education," which was recognized as Best HR Training Practices by Dun & Bradstreet survey 2017 and 2015.

### **THINKING SHIPS: REVOLUTIONARY TECHNOLOGIES TO PROPEL THE FUTURE OF MARITIME SECTOR BY CDR (DR) SHEKHAR MURTHY IN (RETD)**

#### **ABSTRACT OF TALK**

This technical paper explores the concept of "thinking ships" and examines the revolutionary technologies that are set to craft the future of the maritime sector. As the industry seeks to evolve and adapt to an increasingly digital and automated era, the integration of innovative technologies such as artificial intelligence, machine learning, the internet of things, and blockchain holds the potential to revolutionize ship design, operations, maintenance, and maritime logistics. This paper delves into each of these areas through specific use cases and provides insights into how these technologies can transform the maritime sector, enhancing efficiency, safety, environmental sustainability, and cost-effectiveness.



**SHRI BIJU GEORGE, DIRECTOR SHIPBUILDING  
MAZAGON DOCKS LTD**

**PANELIST - SESSION II**

Mr. Biju George is the Director of the Shipbuilding Division of Mazagon Dock Shipbuilders Ltd. - India's premier Warship and Submarine building yard.

An alumnus of the Indian Institute of Technology, Kharagpur, he earned his post graduate degree in Ocean Engineering and Naval Architecture and has more than three decades of experience in the design and construction of frontline warships viz. Missile Destroyers and Frigates. He has put in over three decades of service with MDL.

Having headed the Shipbuilding Design Department to Superintending the prestigious Advanced Stealth Frigates Program P17A and now as the Director (Shipbuilding) MDL, he knows the pulse and the DNA of warship-building.



# **INDIGENISATION EFFORTS AT MDL- ON THE ROAD TO TECHNOLOGICAL SELF-RELIANCE**

**BY SHRI BIJU GEORGE**

## **ABSTRACT OF TALK**

A strong indigenous defence ecosystem is imperative for our Country given the current security environment and strategic objectives. Govt is pursuing maximisation of Indigenous content in warship construction since several years, however with the recent thrust on indigenisation post Pandemic Covid 19 and the Geopolitical scenario which emerged thereafter Indigenisation has gained a new impetus. Indigenisation efforts have gained further urgency due to Russia- Ukraine war which has made it amply clear that there is no other alternative than Atmanirbharata. Indigenisation gives a nation capability of developing and producing equipment within the country for the dual purpose of achieving self-reliance and reducing the burden of imports. Further, indigenisation and self-reliance ploughs back a significant portion of the Govt's budget into the Indian economy and accrues numerous downstream benefits like employment generation and up-skilling of the work force

MDL has been at the forefront of India's Indigenous shipbuilding program since its inception and have played a crucial part in transforming the Indian Navy into a Builders Navy from Buyers Navy, as MDL has constructed Several Frontline Weapon intensive Complex platforms (Destroyers, Frigates) for the Indian Navy in few decades.

In the recent past, with a renewed thrust on Indigenisation, MDL has adopted several initiatives of Govt for increasing the participation of local ancillary industries and MSMEs. Some of the initiatives are listing the equipment for indigenisation on Srijan Portal, Procuring items listed on PILs from Indian OEMs, Procuring items under Make I and Make II initiatives, Purchase preference to local vendors, MSMEs, MSEs, The Buy (Indian – Indigenous Designed Developed and Manufactured (IDDM)).

This paper is an attempt to showcase how MDL have progressed with these initiatives of Govt and contributed to the Govt's vision of Atmanirbharata. The paper will broadly capture the steps taken by MDL for increasing the indigenisation percentage of the warships under construction at MDL, MDL's experience with the process of Indigenisation, distinct advantages and the results of these initiatives.





**MR KOUSTUBH PHALNIKAR, JOINT GENERAL MANAGER –  
PRODUCT TECHNOLOGY & DEVELOPMENT CENTRE  
(DEFENCE & AEROSPACE), L&T DEFENCE**

**PANELIST - SESSION II**

Mr. Koustubh A. Phalnikar is presently working as Joint General Manager- Product & Technology Development in L&T Defence, at Powai. Koustubh's role involves new product development of Land, Naval and Flight Systems with a special focus on Torpedo launch systems, Unmanned Vehicles, and Marine Propulsion.

He joined L&T in August 2007 after an eight year stint in the USA in the biotechnology & clinical diagnostics industry. He is a co-inventor on 7 US Patents, 2 Canadian Patents and 1 European Patent in the field of electro-chemi-luminescence.

He has been a member on the Research Council of CSIR- National Institute of Oceanography, Goa.





# **MINE COUNTERMEASURE USING USV**

## **BY MR KOUSTUBH PHALNIKAR, L&T DEFENCE**

### **ABSTRACT OF TALK**

Larsen and Toubro has indigenously designed and developed an Unmanned Surface Vehicle (USV) with advanced autonomous capabilities and a versatile payload system as a technology development & demonstration platform.

The USV's cutting-edge autonomy suite, featuring guidance, navigation and situation awareness systems enables the user to operate the platform in remote, semi-autonomous and autonomous modes. Its adaptable design allows for integration with various payloads, making it an ideal platform for diverse mission scenarios.

Specifically tailored for mine-countermeasure (MCM) operations, the USV is equipped with a sophisticated MCM suite, encompassing a Side Scan Sonar for the detection of mine-like objects (MLOs). Augmented by an innovative mission planner, the USV autonomously generates scanning patterns based on user-input target area and swath distance, enhancing operational efficiency. The acquired sonar data is transmitted in real-time to a Ground Control Station (GCS), which is further empowered by a deep learning model that has been developed for detection of MLOs and other seabed anomalies using the YOLO image processing algorithm.

The model has been trained on a dataset of sonar images sourced from various online sources. The annotations of various classes of targets on the seabed were marked and trained, resulting in the model showing a high accuracy in detection of various seabed anomalies and MLOs. Real-time high bandwidth data from the USV can be transferred to the mother ship/shore based station at distances of > 10 km for providing live sonar images to the operator.

USVs teamed with an AUV and an ROV can be a game changer in safe detection, classification and neutralization of Mines, thereby strengthening the existing MCM capabilities of the Indian Navy.



# **Session III**

**Opportunities, Challenges And The  
Way Ahead  
(1515-1645 Hrs)**

## **Moderator**

***VAdm P Jaitly PVSM AVSM VSM  
IN (Retd)***

## **Panelists**

***VAdm AK Chawla PVSM AVSM NM VSM  
PhD, IN (Retd)***

***Cmde (Dr) RK Rana, IN (Retd)***

***Capt S Krishnamurthi***

***RAdm (Dr) PJ Rangachari, IN (Retd)***

***RAdm R Sreenivas VSM, IN (Retd)***



**VADM P JAITLY PVSM AVSM VSM, IN (RETD)**  
**MODERATOR - SESSION III**

Vice Admiral Parvesh Jaitly (Retd) joined the National Defence Academy, Khadakvasla and was commissioned into the Electrical Branch of the Indian Navy on 01 July 1965. He is a B.E (Electronics, Electrical & Weapons Engineering) graduate. During his illustrious career spanning 42 years, he held appointments in all facets of technical and logistics management in the Navy. He is also a graduate of National Defence College, New Delhi, India, the premier military training institute in India.

His important assignments include Command of the IN's Electrical Training Establishment. INS Valsura, Admiral Superintendent of Naval Dockyard (Mumbai), Controller of Warship Production and Acquisition – responsible for all shipbuilding, ship repair and ship acquisition activities of the Indian Navy; and steering a multi-disciplinary strategic project for indigenous submarine construction. He served as the Chief of Materiel at Naval Headquarters, the senior most Technical Principal Staff Officer to the Chief of the Naval Staff. In this capacity, he was also on the Board of Directors of M/s. Bharat Electronics, Bangalore, M/s. Mazagon Dock, Mumbai, M/s. Garden Reach Shipbuilders & Engineers, Kolkata and the Indian Registrar of Shipping, Mumbai. For his exceptional distinguished service, he was awarded the PVSM, AVSM and VSM.

His second innings, following his retirement from active service on 31 Aug 2005, has been equally impressive. He has been the consultant to the Defence Business group of Bharat Heavy Electrical Limited from October 2005 to November 2007, a Member of the Committee set up by the Ministry of Defence to review functioning of the Defence Research Development Organisation (DRDO), the Principal Consultant for the Larsen & Toubro (L&T) shipyard project from November 2007 till April 2012 where he successfully steered planning and setting up facilities for a major Greenfield shipyard for L&T; and a Senior Advisor (Infrastructure) to Pipavav Defence Offshore Engineering Company, to set up infrastructure and capabilities for design and manufacture of Defence equipment (2012-2014).

He was a senior editorial adviser of SP Naval Forces, a quarterly publication of SP Guide and Publication and has also been a member of the Committee American Bureau of Shipping National Committee, India as well as the Indian Board of Visitors, M/s Northrop Grumman Inc. US.



**VADM AK CHAWLA PVSM AVSM NM VSM PhD, IN (RETD)**

**PANELIST - SESSION III  
&  
CONCLUDING SPEAKER**

Vice Admiral Anil Kumar Chawla joined the National Defence Academy in Jan 1978 and was commissioned in the Indian Navy on 01 Jan 1982. On completion of his midshipman training, he was awarded the 'Sword of Honour' for being the outstanding midshipman of his course. Over the course of his career, he has commanded five warships, including the aircraft carrier, INS Viraat and the Indian Navy's Western Fleet. His prominent ashore appointments include: Defence Attaché in the Embassy of India, Jakarta; Senior Instructor (Navy) at the Defence Services Staff College in Wellington; Naval Assistant to CNS; Assistant Chief of Naval Staff (Foreign Cooperation & Intelligence); Assistant Chief of Naval Staff (Policy & Plans); Flag Officer Commanding Western Fleet; Director General Naval Operations; Chief of Personnel (Human Resources); and the Flag Officer Commanding-in-Chief of the Navy's Southern Command, from where he superannuated on 30 November 2021, after four decades of distinguished service to his country.

Possessing wide experience in maritime operations, defence acquisition, military diplomacy, human resource management and training, he is an accomplished maritime thinker and author, having been responsible for drafting the Maritime Strategy and several other key capability development documents for the Indian Navy. He has also carried out a number of Joint studies and authored several significant reports for the Indian Armed Forces. He has recently completed his PhD thesis on "The Role of Maritime Power in China's Grand Strategy" from Bombay University.

An active contributor to various defence journals, he is currently an Eminent Resource Faculty – Adjunct Professor for the Rashtriya Raksha University, Gandhinagar, and a Council Member of the United Services Institute. He is also on the board of several other think tanks, both in India and abroad, besides being involved in several DRDO projects/ studies. A prolific writer and speaker, he has penned several articles related to defence strategy, maritime and procurement issues in various national and international journals and speaks regularly at webinars and seminars related to maritime issues. He is also involved in various social and environmental initiatives and has recently started his own plastic waste management enterprise.

# **ATMANIRBHARTA UNBOUND – UNLEASHING THE ANIMAL SPIRITS OF INDIA'S DEFENCE INDUSTRY**

**by**

**VADM AK CHAWLA PVSM AVSM NM VSM PhD, IN (RETD)**

Indigenisation has been an enduring mantra in the defence sector for several decades with the Indian Navy leading efforts in this direction from the 1950s. The progress in indigenous ship-building has culminated in the successful commissioning and operationalisation of India's first indigenous aircraft carrier – INS Vikrant – in 2022. The formulation of the Defence Procurement Procedure (DPP) in 2002 codified acquisition procedures and placed special emphasis on indigenous development and manufacture of weapon systems and platforms with both public and private sector 'Ratnas' anticipated to lead the effort. Despite many refinements in the DPP over the past two decades, several government schemes to encourage indigenous production of defence equipment, and substantial improvement in the participation of India's private sector in defence production, India was the top importer of weaponry in the world in 2022, particularly for major platforms. While defence exports have grown over the past few years, India's share of the global arms industry also remains insignificant.

This fact is anachronistic with India's large defence budget and a long history of defence industrial production. Although several high-level committees have made recommendations in the past to address the problem of defence indigenisation, and many recommendations have been implemented, such as the recent corporatisation of the Ordnance Factory Board (OFB), India still faces several dilemmas in truly reforming its defence industry. Some of the major ones include: excessive bureaucracy in the defence procurement process; dual financial and multi-department scrutiny of major defence procurement cases; non-availability of a 'single vendor procurement process'; inadequate budget and uncertainty in continued funding of capital acquisitions due to non-availability of roll-over clauses; persistent public sector monopoly; etc. The combined result of these issues is a prolonged procurement process, often taking more than a decade for major cases, which leads to cost over-runs, capability gaps and technological obsolescence at the time of induction. Lack of assurance of continued orders, even for products developed by a vendor, prevents production of next generation equipment, as defence companies, both public and private, are loath to spend funds on R&D.

The Atmanirbhar Bharat Abhiyaan launched by the Government of India in May 2020 has found resonance across India, galvanising and synergising disparate attempts at indigenisation in the defence sector. Attempts to spur defence innovation, such as those taken under the Innovations for Defence Excellence (iDEX) programme have also given impetus to the indigenous development of defence technologies and eqpt, especially in areas of emerging technology. A case in point is the Naval Innovation and Indigenisation Organisation (NIIO)-led 'SPRINT' programme, which has ostensibly produced a number of winners with the potential of unleashing a revolution in defence indigenisation. This has been facilitated by a number of policy changes in Chapter III of Defence Acquisition Procedure – 2020, (Procedure for Procurement under 'Make' and 'Innovation' Categories), which need to be replicated in other procurement categories as well.

This presentation examines existing policies and procedures hindering unleashing of the animal spirits of indigenisation, and suggests changes that can ensure that not only does India become self-sufficient to a large extent in defence technology and manufacture, but also becomes a major exporter of defence equipment across the world.



**CMDE (DR) RK RANA, IN (RETD)**

## **PANELIST - SESSION III**

Cmde (Dr) Rakesh Kumar Rana was commissioned into the Indian Navy on 01 Aug 1979. An alumnus of the Delhi College of Engineering, 1980, Mechanical Engineering batch, he completed his post graduation from Royal Naval Engineering College, UK and thereafter pursued his PhD degree that was awarded by IIT, Madras in Jul 96. He has served in various organizations in the Navy encompassing training, research, dockyard, staff, design of warships, indigenous product development and onboard ships, during a long and illustrious career spanning more than 33 years.

His last appointment in service was as Principal Director of Indigenisation at Integrated Headquarters, Ministry of Defence (Navy), New Delhi, where he successfully steered several indigenous naval product development projects. He was awarded Commendations by the Director and Dean twice at IAT Pune in 1986/87 and by CNS in 1992. He was selected as a member of the core team auditing the design of diesel engines developed by two foreign firms for DRDO's futuristic Armoured Fighting Vehicles.

After taking premature retirement from the Navy, he joined Lloyd's Register, the oldest Classification Society, where he (for more than 3-1/2 years) helped the company in strategizing and developing new business opportunities in the Navies, Coast Guard, Army, and other Government agencies, in India and several other countries. He has been recently appointed as the Honorary Senior Advisor at the Foundation for Innovation and Technology Transfer (FITT) of the Indian Institute of Technology, Delhi, which is a Pro bono position.

He has more than 65 technical publications to his credit. An accomplished speaker, his innovative suggestions have been appreciated at the highest levels in the MoD as well as in various industry and academia forums. He has been invited as a Patron and Session Chairman during International Naval Engineering Conferences, World Maritime Technology Conference, 'Engine as a Weapon' Symposium. He is a member of The American Society of Naval Engineers, USA; a Fellow of The Institute of Marine Engineering, Science and Technology, UK, and has been granted the status of Chartered Engineer by The Engineering Council, UK.

# **ARE WE DOING ENOUGH FOR TRANSITIONING TO NET ZERO CARBON IN MARITIME DOMAIN? BY CMDE (DR) RK RANA, IN (RETD)**

## **ABSTRACT OF TALK**

Given the hostile weather conditions that are unpredictable and the havoc that it is creating around the globe, the urgency to achieve Net Zero Carbon emissions has multiplied many times.

Though the scientific and technical community have been putting in their efforts to bring newer solutions for the past many decades, it is encouraging to see the Political Will in many countries to achieve the desired targets. This Political Will is now bringing in the much-needed financial contributions towards accelerating the research and also the adoption of newer technologies.

This brief paper is a follow on from the thoughts shared by the author on “Transitioning to Zero Carbon Fuels for Marine Applications” during the combined NMF + IMF webinar held on 18 Sep 2021.

The maritime domain includes not only the ships at sea, but also the organisations that support and ensures smooth and trouble free (Zero emissions) operations, be it the base ports, industry that supplies the materials to build, operate and maintain the ships etc.

This paper attempts to report on the initiatives taken by the Government, Academia, R & D organisations, startups, shipbuilders and the industry, to share his thoughts on whether the pace of development is satisfactory.





***RADM (DR) PJ RANGACHARI, IN (RETD)***

## **PANELIST - SESSION III**

RAdm Rangachari has over 35 years experience in inducting Contemporary and Futuristic Marine Technologies for the Navy and has held pivotal positions covering Design, Operation, Maintenance and Overall Life Cycle Management of Marine Engineering Propulsion Plant Equipment, Power Generation, Auxiliaries and Engineering Systems - for Warships and Submarines. He actively served on several Combat Platforms as a Marine Engineer Officer in various Ranks. Essentially a Mechanical Engineer, his other Educational Qualifications include a PhD in "Systems and Control Engineering" from IIT(Mumbai), an MS in Advanced Marine Engineering from UK, an MPhil and an MSc on Defence Studies. He is adept in Mathematical Modelling of Marine Propulsion Plants and evinces keen interest in indigenous Design of Marine Equipment, Auxiliaries and Systems including their Condition Monitoring and Fault Diagnostics.

### **APPLICATIONS OF ANALYTICAL TECHNIQUES, CAUSAL MODELLING AND AI IN THE MARITIME DOMAIN BY RADM (DR) PJ RANGACHARI, IN (RETD)**

#### **ABSTRACT OF TALK**

This paper briefly outlines an integrated universal framework for solving complex, uncertain, non-linear problems in the maritime domain by a judicious combination of a class of analytical techniques, dynamic programming and probabilistic causal modelling in an artificial intelligence environment. The fields that can use these techniques are very many and include condition monitoring and fault diagnostics of marine power plants, optimisation problems in the maritime sector, national / maritime security etc to mention a few.





## **RADM R SREENIVAS VSM, IN (RETD)**

### **PANELIST - SESSION III**

R Adm R Sreenivas retired from the naval service on 30 September 2022. His last appointment was as ADG Acquisition Tech (Maritime & Systems) in the Acquisition Wing of Dept of Defence in the Ministry of Defence for nearly 5 years.

He is an alumnus of Andhra University College of Engineering, Naval Academy, Defence Services Staff College, Naval War College, College of Defence Management and National Defence College. He won numerous awards, book prizes, and many accolades for outstanding research during these courses.

He clocked over 15 years on board various ships and ship repair organisations. During the course of two back-to-back appointments in a leadership role as the Commodore Superintendent, Naval Ship Repair Yard, Port Blair (2011-14) and as General Manager (Refits) of Naval Dockyard Visakhapatnam (2014-16) he had an opportunity to steer the refits of over 50% of ships and submarines of the Indian Navy, a rare distinction for any naval officer, and recorded a very fine refit performance for both the yards. He is credited for conceptualising and implementing Business Process Reengineering of NSRY, Port Blair that turned around the Yard from the least-performing ship repair yard for many years in a row into the best-performing Yard among all five ship repair yards of the Navy (as annually assessed by INSMA) for the first time in the Yard's history during 2012-2013 and 2013-14.

He played a key role in processing a large number of acquisition projects worth about Rs 1,80,000 Cr for the Indian Navy, Coast Guard and Electronic Warfare, Surveillance and Systems products for tri-services. He made a significant contribution in processing the largest number of acquisition projects of the Navy with a near 100% fructification rate, which saw a steep increase in the Navy's capital budget from about Rs 19,000 Cr in 2017-18 to over Rs 52,000 Cr in 2023-24.

In addition, he played a major role in evolving Defence Acquisition Procedure 2020, with many progressive features and initiatives for ease of doing business and enhancing transparency and efficiency.

His areas of interest include military restructuring for effective change management, standardisation in defence for variety reduction & agile op logistics, indigenisation & self-reliance and reforms in military acquisition.



# **CHALLENGES AND ECOSYSTEM IMPERATIVES FOR COMPREHENSIVE SELF-RELIANCE IN DEFENCE - A REMEDIAL APPROACH BY RADM R SREENIVAS VSM, IN (RETD)**

## **ABSTRACT OF TALK**

While the clarion call for Atmanirbharata in Defence and restrictions on imports was encouraging, one must be conscious of the long road to achieving Atmanirbharata in each and every vertical and all the dimensions of defence capabilities.

Self-reliance in any field is the sum product of coordinated efforts by many stakeholders, driven towards accomplishing either a national objective or a business objective of individuals/entities or a combination of both. The entire framework in which they all function can be termed as a larger self-reliance ecosystem. Usually, when the objective is large, difficult and requires high investments and coordinated efforts between stakeholders, achieving self-reliance targets requires an exclusive structure/mechanism at the conceptual level to conceive the approach, define the common objectives and drive various stakeholders towards accomplishing it. The structure/mechanism that provides such a comprehensive plan primarily focuses on 'Product Conceptualisation and System Integration' (PC&SI) and provides 'Womb to Tomb' ownership of each and every type of product in use by the armed forces.

Inadequacies in the overall self-reliance ecosystem in the defence domain need an even stronger PC&SE mechanism within the government, so as to act as a catalyst and to mobilise requisite resources for overcoming the systemic shortfalls.

Notwithstanding a few innovations and accomplishments being made from time to time, various difficulties encountered during the acquisition, sustenance and providing seamless op-logistic as seen today are an indication of inadequacies in the PC&SE mechanism, without which achieving comprehensive and systematic Atmanirbharata is extremely difficult and/ or may take much more time and money than what we can afford.

The proposed talk brings out the way ahead to create a robust PC&SE mechanism to take single point 'womb to tomb' responsibility for the life-cycle management of each type of equipment and to steer the nation's self-reliance objectives.





**CMDE AJAY SHARMA, IN (RETD)**

**VICE PRESIDENT, HEAD MARINE SYSTEMS / DEFENCE R&D,  
BHARAT FORGE LTD  
GUEST SPEAKER**

At Bharat Forge Limited Defence, Head Marine Systems, Defence R&D/Electronics, since last 8 years. Part of Top leadership at BFL for formulation & implementation of Defence Strategic Plan. Provide Technology leadership to guide and mentor teams to achieve operational excellence at BFL. A Technocrat with M Tech in Communications from IIT Delhi. Also, have M.Sc in Defence studies. Adept in Business Development with prime focus on technological services in domain of Defence Real time mission critical systems & Future Technologies. Proficient in Stakeholder Management and liaison with International counterparts to enhance business. Retired Naval Officer with Past Professional experience of over 27 years. Was part of R&D organisation of Indian Navy, Weapon Electronic System Engineering Establishment (WESEE), for 12 years. Three decades of rich & diverse experience in Indian navy in various middle & senior management posts. Steered programs of indigenous development of C4I2, RF Data Link Modems, Software Intensive Technical program, and concept of Network Centric Warfare (NCW) of Indian Navy.



# **FUTURISTIC TECHNOLOGIES/ROADMAP FOR INDIGENOUS UNMANNED SYSTEMS**

## **BY CMDE AJAY SHARMA, IN (RETD)**

### **ABSTRACT OF TALK**

Due technological advancement and forthcoming disruptive technologies, current global environment is observing explosive growth in Autonomous systems. Further, being evolved unmanned and autonomous systems are creating fundamental shifts in the way warfare is evolving.

The development and implementation of advanced unmanned technologies are occurring across various domains such as land, air and naval operations. The unmanned/autonomous capabilities not only accrue drastic operational advantages but also provide efficiencies through reduced manpower, risk associated with human involvement in high-risk environments, operating costs as well as offering greater persistence and range, Improved speed and accuracy of data processing; thus supporting a faster decision cycle.

Considering emerging technological trends and requirements of Defence forces matching with prevailing Gov policies on MII and Atmanirbhar, Indian industries are working on multiple options in building unmanned systems. Also Navy has formulated roadmap action plan for Induction of these unmanned systems in line with the capability requirement of the IN.

Bharat Forge Ltd/KSSL due its inherent engineering strength and capabilities is also working on many futuristic technologies/indigenously build of unmanned systems. Centre of Excellence have been created to work and make defence systems utilising recent advances in machine learning. Some of Unmanned/autonomous systems being worked upon include variants of AUVs, UGVs, UAVs, unmanned turrets, underwater weapon systems etc. Indigenous acoustics technologies and systems are build up for surveillance, Mine reconnaissance etc. This is to match vision of Navy on indigenous build of unmanned systems/vessels to strengthen their operations beneath sea, in air. Systems are build up catering for network capability and collaborative engagements. Such technologies/systems can be used in unmanned surface vessels (USVs) and unmanned underwater vehicles (UUVs). Further, the recent focus of unmanned systems has been also on aerial drones operating singly or as a swarm. Concurrently, navies worldwide are actively pursuing development of artificial intelligent enabled unmanned systems, today's UVs equipped with sensors, weapons or payloads can be operated remotely, semi autonomously or autonomously.

In the land applications cutting-edge technologies such as autonomous ground vehicles, robotics infantry and intelligent sensors are being developed. These advancements enable unmanned systems to operate in challenging terrains, conduct surveillance and reconnaissance missions, and perform logistical tasks with minimal human intervention. In addition to the integration of AI & machine learning algorithms enables these systems to adapt to changing environments and make real-time decisions based on collected data.

Similarly, in the air domain, the roadmap for indigenous unmanned systems focuses on the development of advanced unmanned aerial vehicles (UAVs) or drones. These UAVs offer a wide range of applications, including intelligence gathering, surveillance, combat support, and cargo delivery. With improved flight capabilities, enhanced payloads, and longer endurance, they can operate in dangerous or inaccessible areas, providing critical information and rapid response capabilities.

The roadmap for indigenous unmanned systems encompasses ongoing research and development efforts, technological advancements, and policy frameworks necessary for the effective utilization and deployment of these futuristic technologies. It involves collaboration between defense agencies, research organizations, academia, and industry partners to achieve self-reliance in the development and manufacture of indigenous unmanned systems.

These unmanned technologies have the potential to revolutionize military operations, improve efficiency, and enhance safety while enabling nations to maintain a strategic advantage in an increasingly complex and competitive global security environment.



# **Organising Committee**

***Vice Admiral AV Subhedar  
PVSM AVSM VSM, IN (Retd)  
Chief Coordinator***

***Rear Admiral RJ Nadkarni  
AVSM VSM, IN (Retd)  
Seminar Convener***

***Cmde Ajay Chitnis  
SC, NM, IN (ret), VP IMF  
Vice President, IMF***

***Our grateful thanks also to:-***

***Cmde Rajan Vir, IN (Retd)  
President Emeritus IMF***

***Vice Admiral DSP Varma, PVSM AVSM VSM  
IN (Retd)***

***IMF Council Members***



**VADM AV SUBHEDAR PVSM AVSM VSM, IN (RETD)**

## **CHIEF COORDINATOR**

Vice Admiral AV Subhedar PVSM AVSM VSM (Retd) was commissioned in the Indian Navy in August 1977 in the Engineering branch and is a post graduate in Marine Engineering from Pune University. During his career, spanning almost four decades, the Admiral has held several important assignments, both Afloat and Ashore. He has served on five frontline warships and was also the Fleet Engineer Officer, Western Fleet in 1998.

His important shore appointments include Director Naval Training and Director Ship Production at Naval Headquarters, Director Machinery Trials and Acceptance Authority (Mumbai), Warship Production Superintendent (Mumbai), General Manager (Refit), Naval Dockyard Visakhapatnam. After attaining Flag rank in 2008, he served as Chief Staff Officer(Technical), Eastern Naval Command, Visakhapatnam and Admiral Superintendent, Naval Dockyard, Mumbai. On promotion to Vice Admiral, he took over Director General Naval Projects, Mumbai, where he was responsible for planning and execution of major technical and marine infrastructure for the Navy on West Coast...

..Subsequently, he served as Controller of Warship Production & Acquisition at Naval Headquarters New Delhi and oversaw the commissioning of three indigenously built Indian Warships viz. INS Kolkata, a destroyer; INS Kamorta, a Corvette and INS Sumitra, a Naval Offshore Patrol Vessel during his tenure. He took over as the Chief of Materiel at Naval Headquarters, the highest post any technical naval officer can aspire for on 31 May 2015. The Admiral retired on 31 Oct 16 after more than 39 years of illustrious service.

He has served as the Board member of M/s Mazagaon Dockyard Limited, M/s Garden Reach Ship Builders and Engineers, M/s Goa Shipyard Limited, M/s Hindustan Shipyard Limited as well as M/s Bharat Electronics Ltd.

For his distinguished service of exceptionally high order, he was awarded as Vishisht Seva Medal in 2009, Ati Vishisht Seva Medal in 2011 and Param Vishist Seva Medal in 2016 by the President of India.



***RADM RJ NADKARNI AVSM VSM, IN (RETD)***

## **SEMINAR CONVENER**

Rear Admiral Ravindra Jayant Nadkarni was commissioned in the Indian Navy on 01 Jul 1983 and is a graduate of the National Defence Academy, the Defence Services Staff College, the College of Naval Warfare and the National Defence College, New Delhi.

He is a Navigation and Direction specialist who has served as Navigating Officer of IN Ships Kuthar and Rana. He has the distinction of commanding one ship in each rank from Lieutenant to Captain: CGS C-05 as Lieutenant, INS Cuddalore as Lieutenant Commander, INS Himgiri as Commander and INS Betwa as Captain.

His important staff appointments include Command Plans Officer, Western Naval Command and Director of Naval Intelligence (Operations) at Naval Headquarters. He has carried out instructional appointments at the Navigation & Direction School and Centre for Leadership and Behavioural Studies and also served as Directing Staff at DSSC, Wellington.

As a Flag Officer, he has held the appointments of Chief Staff Officer (Operations), WNC, Flag Officer Doctrines and Concepts, Flag Officer Commanding Karnataka Naval Area, Chief of Staff, Southern Naval Command, and was the Flag Officer Offshore Defence Advisory Group prior to his retirement from service on superannuation on 30 Nov 2020.

He is a recipient of the Vishisht Seva Medal in 2014 and Ati Vishisht Seva Medal in 2019.

Post-retirement, he has settled down in Pune where he is a member of the Indian Maritime Foundation and the Centre for Advanced Strategic Studies.







**CMDE AJAY CHITNIS, SC, NM, IN (RETD)**

**VICE PRESIDENT, IMF**

Cmde Ajay Chitnis, after his initial schooling, joined IIT Bombay in 1966 and was pursuing a course in Electrical Engineering, but after three years decided that this was not his calling and joined the Indian Navy as an Aviation Cadet. Two years later in June 1971, he qualified as a Fighter Pilot and was commissioned in the Indian Navy. He converted to helicopters and specialized on ASW helicopters, clocking over 3000 hours of operational flying by day and night, with over 700 deck landings on frigates and destroyers to his credit.

He was the youngest officer to be appointed as Flight Commander on INS Nilgiri, at the age of 25. He was deputed to Russia for training on the Kamov 25 anti-submarine helicopters and formed the commissioning crew of the destroyer INS Rajput. He also commanded three frontline warships and an operational air station, besides being the Naval Area Commander of Gujarat during the 1999 Kargil conflict. His other important assignments were Chief Staff Officer (Operations) at HQ Southern Naval Command, Directing Staff at DSSC and Deputy Director Naval Air Staff (Ops and Flight Safety) at NHQ. He is the recipient of two gallantry awards – Shaurya Chakra (SC) and Nao Sena Medal (NM) from the President of India. Cmde Chitnis retired from the Indian Navy in 2001 after completing 30 years of distinguished service.

Post-retirement, he specialized in marine operations in the oilfields off the West and East Coasts of India. After 5 years at sea, he took up a shore job as Head of Training and set up a training center for offshore operations, where he was instrumental in setting up a state-of-the-art OSV simulator. He then headed the HR and Admin functions in addition to Training, till end January 2016. He is a visiting faculty at the Savitribai Phule Pune University, for the Maritime Security Course and also conducts the Offshore Installation Manager Course at Gulf Coast Training Centre.

As the Vice President of the Indian Maritime Foundation, Cmde Chitnis has organized IMF Seminars on 'International Jointmanship in the Constabulary Role', 'Indian Maritime Paradigm, the Past, Present and Future' and 'Role of Disruptive Technologies in the Maritime Domain' at Pune.

He is also an active Rotarian and took over as the President of the Rotary Club of Pune Central (RID 3131) in 2023.



## *The Sea our Strength* **Registration**

The IMF will conduct the Annual Seminar on 12 Oct 2023 at the Central Park Hotel, Pune on the theme "*Fostering Innovation and Indigenisation in the Maritime Domain.*" Attendance at the seminar would be on the basis of registration, for which a nominal fee of Rs. 900 will be charged. The process for registration is available on the IMF Website (Home>Activities> Upcoming Events).

We will also be livestreaming the seminar on YouTube to reach out to a larger online audience. The livestream link will be shared on our website and Facebook page.

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