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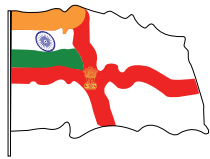
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ADMIRAL SUNIL LANBA  
PVSM, AVSM, ADC  
Chief of the Naval Staff



Integrated Headquarters  
Ministry of Defence  
(Navy)

### MESSAGE

I am pleased to learn that the SP Guide Publications is publishing a special issue of *SP's Naval Forces* on the occasion of Navy Day covering the role and achievements of the Indian Navy.

This publication offers its readers a broad perspective of Indian Navy's pivotal role in safeguarding and promoting national security in the maritime domain. The Indian Navy has evolved in size and capability commensurate with its steadily expanding mandate and growing significance to national security. The Navy's operational footprint has correspondingly extended covering the Indian Ocean Region and beyond.

I am confident that SP Guide Publications will continue to provide valuable insights in the forthcoming years and be of interest to stakeholders at different levels of our national security apparatus as well as people from all walks of life with an interest in matters military.

I wish the publication the very best in all its endeavours.

(Sunil Lanba)  
Admiral  
Chief of the Naval Staff



# Indian Navy Mission Deployed and Combat Ready

*"As we surge ahead in the 21st century, the attention of the entire world is focused on the Indian Ocean region, where our Navy is increasingly seen as a 'net security provider'."*  
—Admiral Sunil Lanba, Chief of the Naval Staff

Continued on page 3...



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During his third press conference, on the eve of the Navy Day, Admiral Sunil Lanba presented a broad overview of the Indian Navy's major operational activities over the past year, and also highlighted Indian Navy's future plans. He stated, "As we surge ahead in the 21st century, the attention of the entire world is focused on the Indian Ocean Region, where our Navy is increasingly seen as a 'net security provider'. The maritime dimension of India's security and its importance to national development and economic prosperity is well recognised today and has been articulated at the highest levels by our leadership. Accordingly, our maritime security strategy is aimed at providing a maritime environment that is free from all forms of traditional and non-traditional threats to our national development."

This statement defines the role of the Indian Navy for national security as well as economic development in very clear terms. Some achievements of the Navy are highlighted which clearly indicate that it is on the right path to achieve its stated goals. The first aspect is that the Navy has successfully completed the first deterrence patrol of INS Arihant this year which is the most survivable segment of the country's nuclear triad. Second aspect is that during 2017, the Navy had undertaken a major review of its operational deployment philosophy based on the prevalent security threats and challenges. As a result of the review, the deployment phi-



**Another Feather in the Cap:** Jayant Baranwal, CMD, SP Guide Publications presenting a copy of *SP's Civil Aviation Yearbook* to Admiral Sunil Lanba, Chief of the Naval Staff. Recently released, *SP's CAYB* is the latest publication from the publishing group.

losophy has been recalibrated. The last major aspect is that the Navy has been most successful in countering the menace of piracy in the Gulf of Aden and elsewhere. Statistics indicate that the Indian Navy has thwarted 44 piracy attempts and apprehended 120 pirates.

There was an exclusive interaction between Admiral Sunil Lanba and Jayant Baranwal, Editor-in-Chief of *SP's Naval Forces* and Rear Admiral Sushil Ramsay, Senior Editorial Adviser, *SP's Naval Forces*. In one of the key questions asked by Jayant Baranwal on the progress of Strategic Partnership (SP), Chief of the Naval Staff replied that it is true that SP Model has taken time to fructify

due to several complex issues. However, the SP as a model now stands approved by the Government. For the Indian Navy, Letter of Acceptance (LoA) for 111 Naval Utility Helicopter has been issued and approval from Defence Acquisition Council has been accorded. Likewise, LoA for six conventional submarines under SP Model has also been issued for Project 75(I). There was also a similar interaction with the CNS on December 3. Read all about it in this issue.

Indian Navy's foot print is expanding with Indian Naval ships patrolling the far reaches of the Indian Ocean and connected regions. Read all about it in an article on the subject. Then there is an article on Navy's sea

power, write ups on Exercises Simbex, Konkan and INDRA; and report on MAST INDO-ASIA 2018. This issue just about wraps up with the usual News Digest and Flag Postings.

Wish you all discerning readers merry Christmas and a very happy and glorious 2019.

**JAYANT BARANWAL**  
Publisher & Editor-in-Chief

#### ■ REAR ADMIRAL SUSHIL RAMSAY (RETD)

**A**DDRESSING HIS THIRD MEDIA Interaction on December 3, 2018, after taking over as the Chief of the Naval Staff, Admiral Sunil Lanba said, "We in the Navy, duly acknowledge Media's contribution towards shaping the maritime discourse in the country. We are grateful to the media for having presented news, opinions and enlightened debates on naval matters through the years. The Navy Day is celebrated to commemorate the success of Operation Trident, which saw missile boats of the Indian Navy's Killer Squadron, undertaking a blazing attack on Karachi harbour on December 4, 1971." He added, "I would also like to remember one of our illustrious Flag Bearers, Vice Admiral Manohar Prahlad Awati, who passed away last month. He was the Commanding Officer of INS Kamorta and played a stellar role in the 1971 War for which he was awarded the Vir Chakra."

Admiral Sunil Lanba presented the broad overview of the Indian Navy's major operational activities over the past year, as also highlighted Indian Navy's future plans. He stated, "As we surge ahead in the 21st century, the attention of the entire world is focused on the Indian Ocean region, where our Navy is increasingly seen as a 'net security provider'. The maritime dimension of India's security and its importance to national development and economic prosperity is well recognised today and



**An Officer and a Gentleman:** Chairman of the Chiefs of Staff Committee and Chief of the Naval Staff Admiral Sunil Lanba

PHOTOGRAPH: Indian Navy



EXCLUSIVE

## “Strategic Partnership will facilitate the Indian industry in imbibing niche technologies in helicopter manufacturing which would benefit the industry as well as the Indian Armed Forces in the long run”

On the occasion of Navy Day 2018, Jayant Baranwal, Editor-in-Chief of *SP's Naval Forces* had an exclusive interview with Admiral Sunil Lanba, the Chief of the Naval Staff. Excerpts:

**Jayant Baranwal (JB):** While the commissioning and operationalisation of IAC-1 is expected by 2020, there are considerable uncertainties over the launch of Project IAC-2. What is your assessment/perspective on the launch of prestigious IAC-2 programme?

**Chief of the Naval Staff (CNS):** The IAC-1 is expected to get commissioned by early 2021. The Navy envisages its second Indigenous Aircraft Carrier (IAC-2) to be an electric propelled, 65,000 tonnes CATOBAR carrier. At present, the case is being examined and deliberated with MoD (Ministry of Defence) with reference to the overall financial implications of the Project vis-à-vis Navy's long-term budget availability. Post accord of Acceptance of Necessity (AoN), a feasibility design study would have to be conducted for which we may seek consultancy from a reputed design house. The exact scope of work and timelines for execution of the project can only be drawn post accord of AoN and completion of feasibility design study of the project.

IAC-2 is being designed to meet the requirements of Indian Navy in the challenging future strategic environment. Various feasibility options for the carrier are being pursued. The Indian Navy is very optimistic about IAC-2 and we are hopeful that the Government would accord the requisite approvals to get the Project off-the-blocks soon. The IAC-2 would provide critical capabilities to the future naval force, which would be central to our operational philosophy to secure national maritime interest in the future.

**JB:** Another prestigious programme to bridge the critical operational gaps in the sub-surface fleet of Indian Navy is P-75(I). Despite Government's approval for P-75(I) to be steered within the ambit of Strategic Partnership (SP) Model there are no visible signs of its launch. What is the present status P-75(I)?

**CNS:** P-75(I) is indeed being progressed under the Strategic Partnership (SP) Model as promulgated by the Government of India in Defence Procurement Procedure 2016. To ensure uniform guidelines for progressing all four segments of the SP Model, the Defence Acquisition Council approved Generic guidelines in July 2018. Promulgation of Segment specific guidelines by Government of India/Ministry of Defence for the Submarine segment is



PHOTOGRAPHS: Cochin Shipyard, US Navy



(Top) Indian aircraft carrier Vikrant in Cochin Shipyard, Kerala;  
(above) Sikorsky MH-60R Seahawk is the sole contender for Indian Navy's MRH requirement

expected shortly. The Expression of Interest documents for short listing of Strategic Partners and Foreign OEMs for P-75(I) are likely to be issued by end-2018 followed by likely issue of RFP by mid-2019.

**JB:** The Defence Acquisition Council on August 25, 2018, has approved procurement of 111-armed Naval Utility Helicopters (NUH) for Indian Navy at a cost of over ₹21,000 crore, as also the approval to procure 24 Naval Multi-Role

Helicopters (NMRH) with anti-submarine warfare and anti-surface warfare capabilities. In your assessment what will be the timelines for launch and execution of NUH programme? Likewise, what is the status of 123 NMRH programme?

**CNS:** These two projects, the NUH and NMRH, are being pursued under the 'SP' model. The response to RFIs for both projects has been very encouraging. Several OEMs have shown interest towards manufacturing these helicopters in India. The

**The IAC-2 would provide critical capabilities to the future naval force, which would be central to our operational philosophy to secure national maritime interest in the future.**

NUH is the basic ship borne utility helicopter with relatively lesser complexities, which are likely to be inducted in a phased manner commencing 2024. The NMRH is a complex platform with sophisticated weapons and sensors. Therefore, the induction of NMRH may take one or two years more than the NUH. The most significant aspect of the Strategic Partnership is that it will facilitate the Indian industry in imbibing niche technologies in helicopter manufacturing which would benefit the industry as well as the Indian Armed Forces in the long run.

**JB:** Kindly elucidate the status on procurement of 57 Multi-Role Carrier Borne Fighters programme for Navy?

**CNS:** The RFI of the MRCBF was hosted in January 2017. Responses from the vendors have been comprehensive and are presently under examination. The aircraft selected would be such that changes required to the existing aircraft carriers to operate the aircraft, if any, would be minimal. The RFP is likely to be issued in 2019.

**JB:** After prolonged delays, more than a year ago 'Approval in Principal' for acquisition of four LPD/LHD was accorded by the Government for construction by Indian Private Sector shipyard in collaboration with a foreign OEM. What is the status of the project?

**CNS:** The induction of four LPDs is part of the Indian Navy's Maritime Capability Perspective Plan. Post accord of approval by the DAC, for construction of all four ships by private shipyards cleared by the Technical Evaluation Committee, the case has been taken over by the Contract Negotiating Committee which is presently awaiting certain procedural clearances to progress the case further. [SP](#)

has been articulated at the highest levels by our leadership. Accordingly, our maritime security strategy is aimed at providing a maritime environment that is free from all forms of traditional and non-traditional threats to our national development”.

He added, “You are aware that the Indian Navy has successfully completed the first deterrence patrol of INS Arihant this year. With this, we have operationalised the third and the most survivable segment of the country's nuclear triad.”

He highlighted that during 2017 Indian Navy had undertaken a major review of its operational deployment philosophy and based on the prevalent security threats and challenges the same was recalibrated

**“The Indian Navy has successfully completed the first deterrence patrol of INS Arihant this year. With this, we have operationalised the third and the most survivable segment of the country's nuclear triad.”**

towards 'Mission Based Deployments' in the areas of maritime interests to India. As regards commitment to thwarting the bane of piracy in the Gulf of Aden, the Indian Navy remains steadfast and committed towards curbing this global menace. Since 2008, a total of 70 Indian Naval warships have been deployed, which have safely escorted more than 3,440 (including 413 Indian flagged) ships with over 25,062 mariners embarked. He brought out that so far, the Indian Navy has thwarted 44 piracy attempts and apprehended 120 pirates, a visible demonstration of Indian Navy's efforts towards guaranteeing safe and secure seas to mariners. He informed that during November 2018, one of Indian

Navy's mission-deployed ships in the Gulf of Aden intercepted a suspected pirate vessel off the coast of Somalia and seized weapons and ammunition from it”.

What has been operationally achieved across the wide canvas of maritime theatre was largely due to the combat skills honed during major exercises. During 2018, the Navy exercised its composite combat capability through an array of theatre-level exercises, both on the Western as well as Eastern seaboard. In addition, a theatre-level operational level war gaming exercise titled SHIKSHA-18 which included proving of joint concepts with Indian Army and Air Force was conducted.

On similar lines and with engagement



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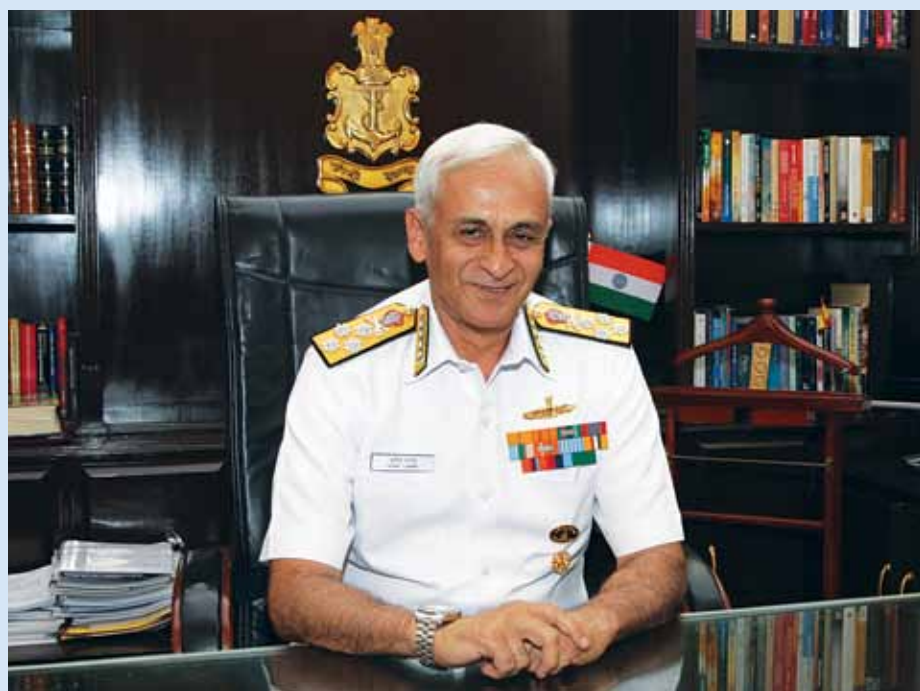




## TÊTE-À-TÊTE

Interaction with  
Admiral Sunil Lanba,  
Chief of the Naval Staff

An excerpt of the personal interaction between **Admiral Sunil Lanba**, the Chief of the Naval Staff in his Chamber on November 8, 2018 and **Jayant Baranwal**, Editor-in-Chief of *SP's Naval Forces* and **Rear Admiral Sushil Ramsay**, Senior Editorial Adviser, *SP's Naval Forces*:



**Jayant Baranwal (JB):** How is the Strategic Partnership (SP) model progressing which seems to have taken a little longer than what was expected?

**Chief of the Naval Staff (CNS):** It is true that SP Model has taken time to fructify due to several complex issues. However, the SP as a Model now stands approved by the Government. For the Indian Navy Letter of Acceptance (LoA) for 111 Naval Utility Helicopter (NUH) has been issued and approval from Defence Acquisition Council (DAC) has been accorded. Likewise, LoA for six conventional submarines under SP Model has also been issued for Project 75(I). Shortly, the case will come up for DAC approval. While Indian Navy is very supportive of participation of private sector shipyards in the Navy's modernisation programmes, we have to very carefully assess the infrastructure, production and financial capabilities. The construction load of Project 17A is being shared between MDL for four ships and GRSE for three ships based on the modular concept of construction. In this programme the participation of private sector shipyards within the country is synergised very well.

**JB:** How about the acquisition of four Landing Platform Docks (LPDs)?

**CNS:** Based on an internal audit report the financial status of Reliance Naval & Engineering Ltd (RNEL) is being examined. Further the case is now referred to the Supreme Court.

**JB:** What is the current status of acquiring DAC approved 24 Multi-Role Helicopters (MRH)?

**CNS:** The Ministry of Defence has approved acquisition of 24 anti-submarine warfare and anti-ship MRH. The case is being processed through FMS.

**JB:** How is the IAC-1 progressing and what is the present status of IAC-2?

**CNS:** IAC-1 is getting on with the sea trial

phase very well. The aircraft carrier is expected to be ready by 2020 and be fully operational for induction in the Indian Navy by 2021. Acceptance in Principle (AIP) of IAC-2 however, is still awaited.

**JB:** How about minesweepers or mines counter-measure vessels (MCMV)?

**CNS:** As you know, the acquisition of 12 MCMVs has been delayed for various reasons. It is now hoped that the nominated shipyard, Goa Shipyard Ltd will issue Expression of Interest (EoI) over design and technology transfer arrangements with the partner OEM, in the near future.

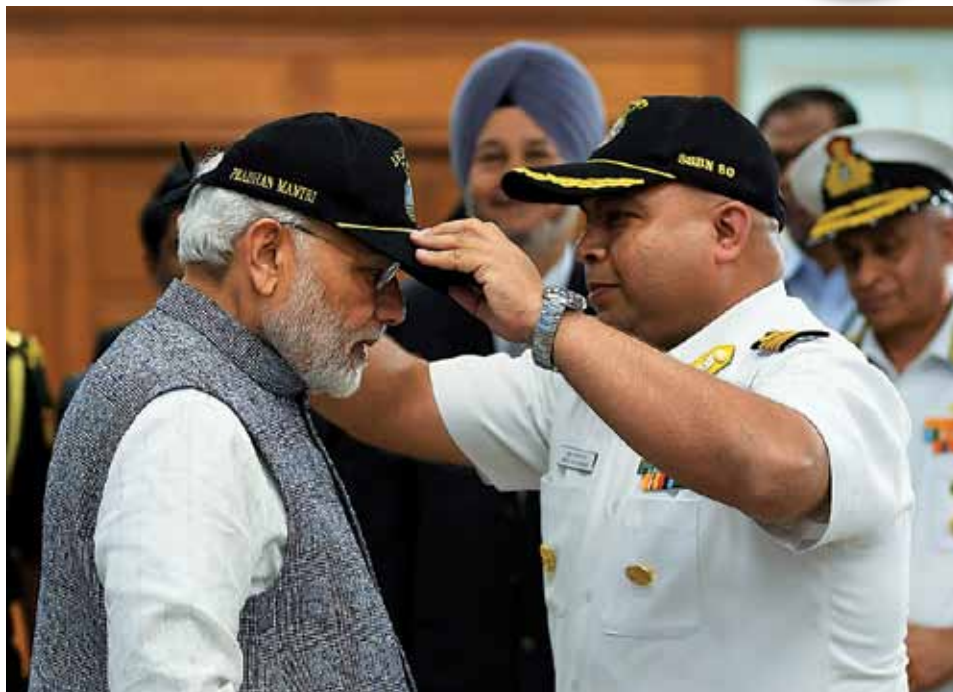
**JB:** Now that the mission INS Tarangini has made all of us so much proud and has indeed achieved remarkable success, do you foresee yet another mission on the same lines in near future?

**CNS:** Despite making very good progress in the Golden Globe Race, Commander Abhilash Tomy encountered severe cyclonic weather and adverse sea conditions in the South Indian Ocean as a result of which his boat was dismasted and he received severe back injuries. Unfortunately he had to withdraw from the race. As for present, there is no such adventure scheme being considered. In case any enthusiastic woman sailor volunteers for a solo circumnavigation of the globe, such a project can be considered.

**SR:** What is the status of Medium Repairs and Life Certification (MRLC) of conventional submarines of Shishumar and 877 EKM classes to be undertaken indigenously?

**CNS:** Government has approved MRLC of the first SSK, INS Shishumar to be indigenously undertaken at the Public Sector Shipyard, Mazagon Docks Shipbuilders Ltd. MRLC of the 877 EKM class is being assigned to Russian Shipyards. Currently there is no plan for MRLC to be undertaken indigenously for 877 EKM class submarines. 🇮🇳

PHOTOGRAPH: narendramodi / twitter



Prime Minister Narendra Modi being felicitated by INS Arihant crew

with the Indian Coast Guard a sharp vigil over India's vast coastline including the island territories was maintained. Dedicated joint coastal security exercises such as Sagar Kavach and Avardhan have significantly augmented collective surveillance efforts along the coastal areas.

The flagship Theatre Level Operational Readiness Exercise (TROPEX) is scheduled from end January till early March 2019. The exercise will see participation of all operational ships, submarines and aircraft as well as units from the Indian Coast Guard. In addition, significant participation from the Indian Army and Air Force will truly enhance the integrated operations of the three Services. As part of TROPEX a large-scale coastal defence exercise 'Exercise Sea Vigil' which will involve all stakeholders across mainland and island territories will be conducted to test the robustness of entire coastal security apparatus during TROPEX.

For stable and tranquil maritime boundaries to enhance interoperability as well as to develop common understanding of the region's security challenges, numerous regional maritime exercises with partner nations are undertaken. During 2018, the tempo of overseas deployments and maritime exercises was at an all-time high as Indian Navy was deployed for the following operational exercises/activities which enhanced interoperability and ensured security in the maritime neighbourhood as well as in the 'Global Commons':

- Participation in close to 20 exercises with friendly foreign countries.
- The participation was across a wide canvas ranging from Varuna off Reunion Islands, Malabar off Guam, RIMPAC at Hawaii, Kakadu at Darwin, WPNS cum IFR at Jeju, Republic of Korea, IBSAMAR

off Simons Town, South Africa, SLINEX off Trincomalee and the 25th edition of SIMBEX off Port Blair and Visakhapatnam have helped Indian Navy further enhance collaborative efforts with the navies of the Indian Ocean region and beyond.

- Under the Government of India's overall rubric of 'Neighbourhood First' policy, the Indian Navy undertook Joint EEZ patrols of Maldives, Seychelles and Mauritius, as well as Coordinated Patrols (CORPATs) with Myanmar, Thailand and Indonesia.
- Maiden bilateral exercises with UAE and Indonesia and maiden CORPAT with Bangladesh commenced during 2018.
- Indian Navy is on the cusp of commencing bilateral exercises with Bangladesh and Malaysia during 2019.

In addition to honing combat skills and forging closer ties with maritime neighbours and partners, Indian Navy continued to be at the forefront of humanitarian assistance and disaster relief efforts. The devastating impact of climate change was serious cause of concern during 2018. During unprecedented floods in Kerala, Indian Navy conducted Operation Madad for over two weeks, rescuing over 16,843 people and followed-up with elaborate relief and rehabilitation efforts. For the large-scale rescue efforts during Cyclone Titli that hit East Coast, personnel, relief materials and assets were synergised to provide succour to those affected by the tragedy. During 2018, Navy's assets to undertake relief missions in Bangladesh, Indonesia, Sri Lanka and Mauritius were synergised to augment relief efforts. Indian Navy remains committed and ready to provide succour and relief in any part of the nation as well as in the Indo-Pacific region.

PHOTOGRAPH: Indian Navy



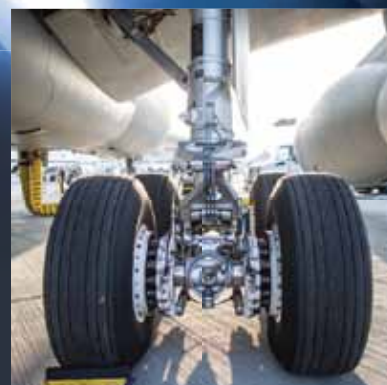
Indian Navy relief operations during Operation Madad in the recent Kerala floods



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EXCLUSIVE

Quick Questions to CNS on December 3, 2018

Jayant Baranwal, Editor-in-Chief, *SP's Naval Forces* in conversation with the Navy Chief, Admiral Sunil Lanba on the eve of Navy Day.

**Jayant Baranwal (JB): How do you perceive Indian Navy versus the Pak and the Chinese Navy and how equipped are we to handle the so-called two-front war with them?**

**Chief of the Naval Staff (CNS):** As far as the Indian Navy is concerned, we don't have fronts, we have only one front that is the Indian Ocean, so we don't divide into any fronts. As far as the Pakistan Navy is concerned, we have the apt superiority under all fields and all domains. As far as the Indian Ocean is concerned versus China, the balance of power rests in our favour.

**JB: What about South China Sea?**

**CNS:** Because same advantages rest with China in the South China Sea, the balance of power will be in their favour.

**JB: Regarding Helicopter there a few elements, there is NUH with 111 numbers and MRH – 24 helicopters being requested from the US, plus some follow-up for MRH that can be 100 plus in quantity later on. Please share**

**some clarity on this.**

**CNS:** As far as the helicopter case goes, there are three programmes, we have got the AoN for the Naval Utility Helicopter (NUH) under the strategic partnership model for a 111 helicopters. Next there are two cases on the Multi-Role Helicopter (MRH), first is a direct acquisition through the foreign military sales (FMS) route from the United States for 24 Multi-Role Helicopters, thereafter, now going to take up the case for 123 Naval Multi-Role Helicopter (NMRH) under the Strategic Partner model, which will be built in India.

**JB: What is Navy doing to attract the youth to join the services?**

**CNS:** We are taking a number of measures to encourage the youth to join the armed forces, including advertising and media campaigns, continued image projection, participation in career fairs and exhibitions, campus recruitments. We get a good traction for the vacancies, for every one post there are about 400 applicants, to give you an example. [SP](#)



The Indian Navy's initiatives such as the Indian Ocean Naval Symposium – IONS; MILAN – the biennial gathering of regional navies at Port Blair and Goa Maritime Conclave, have enabled constructive dialogue amongst navies of the Indian Ocean region. CNS informed that presently there were

32 ships and submarines under construction in Indian shipyards. These include IAC-1, Vikrant, P-15B class guided missile destroyers, P17A class guided missile stealth frigates, P28 ASW corvettes, off-shore patrol vessels and Scorpene class submarines. In addition, Government

approval has also been accorded for 56 ships and six submarines. The indigenous aircraft carrier, Vikrant is presently in its third and final phase of construction at Cochin Shipyard in Kerala. The sea trials for the ship are expected to commence mid-2020 and rigorous efforts

are being made to achieve the delivery timelines. Induction of Vikrant will provide significant fillip to the Navy's blue water capability, increasing the reach and impact of carrier-borne strike forces, both as a means of deterrence as well as during combat operations. [SP](#)

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# Expanding Operational Footprints of the Indian Navy

Indian Naval ships patrol the far reaches of the Indian Ocean and guard its gates, off the Cape of Good Hope and the Madagascar Channel, in the Red Sea, in the Bay of Bengal and Andaman Seas, and off the straits connecting the Indian Ocean to the Pacific in the East.

■ COMMODORE LALIT KAPUR (RETD)

**S**PEAKING AT THE FOUNDATION stone laying ceremony for the Indian National Defence University in Gurugram in May 2013, then Prime Minister Manmohan Singh said that India has “sought to assume our responsibility for stability in the Indian Ocean region”. He went on to add, “We are well positioned, therefore, to become a net provider of security in the Indian Ocean in our immediate region and beyond”. These words marked perhaps the first time that an aspiration for a regional maritime security role had been voiced at India’s apex political level. The nation’s interest in maritime security was further expanded during Prime Minister Modi’s visit to Mauritius in March 2015, when he said, “We seek a future for Indian Ocean that lives up to the name of SAGAR – Security And Growth for All in the Region.” By expanding its maritime footprint to provide security both to the Indian Ocean and India, the Indian Navy, the nation’s lead agency tasked with defending the nation’s maritime interests, has laid the foundations for the region’s economic growth.

Why is maritime security, particularly in the Indian Ocean, important for the world, the region and for India? In 2017, world merchandise trade exports were \$17.73 trillion, or nearly 70 per cent of total global trade (the remaining 30 per cent comprised trade in services, which predominantly uses the cyber commons). More than 60 per cent of this merchandise trade passed through the free and ungoverned maritime commons. 70 per cent of world seaborne energy traffic, half of its container traffic and 40 per cent of bulk cargo transits through the Indian Ocean, making it the vital crossroads of the global economy. Use of the seas is bound to increase as the world becomes increasingly interlinked. The GDP of nations represented at the East Asia Summit (including India), connected almost entirely by the maritime commons, has been estimated at \$65.8 trillion in 2017 and is estimated to rise to \$95.6 trillion in the next three years. For India, 90 per cent of exports by volume and over 80 per cent of the fossil fuel energy that powers its growing economy travel across the seas, necessitating security not just at the destination, but throughout the predominantly maritime commons from the source.

Challenges in the maritime domain arise from the three broad sources. The first is forces beyond the control of man, such as accident, natural disasters and regional instability. People in the region impacted by these require succour, whether it be by way of search and rescue (SAR) mechanisms or humanitarian assistance and disaster relief (HADR). The second is from sub-state and non-state actors, who exploit the ungoverned nature of the seas for private gain, resulting in challenges such as piracy and armed robbery at sea, terror, transnational crime, illegal and unauthorised fishing, environmental pollution, etc. Their actions are directed against the common good and



INS Satpura evacuated Commander Abhilash Tomy using the ship’s integral helicopter, treated him and brought him back to India

security encompasses prevention of such exploitation, or at least appropriate punitive action. The third is revisionist nation states, who seek opportunities to exploit the existing international weaknesses and subvert established international law for their own benefit. Unless deterred, their actions result either in acceptance of diminished security for others, or conflict.

Until the turn of the century, India was content to focus on territorial security and leave security of the commons to extra-regional powers. The days of one nation providing security throughout the oceanic space have, however, receded into history. Even USA finds the task beyond its capacity, as was proved when piracy became a serious concern off the Horn of Africa. Dealing with the diverse variety of challenges requires cooperative structures involving all states of the region, to enable awareness of the developing challenge; cooperative decision-making; preventive measures, which will usually necessitate presence; and punitive measures to impose appropriate costs on the offender. The fact, moreover, is that those who provide security get to set the agenda and reap consequential economic benefits. It is this realisation that led to India’s aspiration to become a ‘net security provider’.

The Indian Navy has since then been active in tackling all three sources of maritime insecurity throughout the Indian Ocean. A well-developed apparatus has been evolved to deal with challenges generated by accident, natural disasters and regional instability. Proof of the pudding came from dramatic rescue of Commander Abhilash Tomy, participating in the Golden Globe round the world solo yacht race earlier this year. On September 22, the Indian Navy’s Maritime Operations Centre received a call that the officer had severely injured his back due to the rough seas and needed evacuation. The Indian Navy swung into action, launching a P-8I aircraft and staging it through Mauritius to locate and track him. A French fishing vessel was the first to reach his location and evacuated him to Island Amsterdam, a tiny French island over 5,000 Km South of Kanyakumari. INS

Satpura, mission-deployed in the Southern Indian Ocean, diverted to Island Amsterdam, evacuated him using the ship’s integral helicopter, treated him and brought him back to India. Numerous similar missions have been successfully carried out in the last one year, ranging from providing relief following cyclone Titli in Odisha and Andhra Pradesh, SAR operations in Assam, and the rescue of fishermen off Kochi, to HADR assistance to the tsunami hit residents of Palu, in Sulawesi, Indonesia; evacuation of stranded Indians from Socotra following cyclone Mekunu; liaising with the navies of Nigeria, Ghana and Benin to locate and secure release of the hijacked motor tanker Marine Express with 22 Indian crew on board; provision of relief to Mauritius following cyclone Berguitta; medical evacuation in the Maldives and much more.

The Indian Navy is also at the forefront when it comes to combating challenges from sub and non-state actors. The key requirements here are surveillance to pick up what is happening, as well as presence, to intercept the offender. The Indian Navy’s P-8I and IL-38 maritime patrol aircraft operating from Arakkonam and Goa, augmented by Dorniers, UAVs and satellites carry out surveillance throughout the Indian Ocean, feeding data gathered into the Information Management and Analysis Centre at Gurugram. When coupled with White Shipping Agreements and other inputs from friendly countries, this surveillance enables Maritime Domain Awareness (MDA). Indian Navy and Coast Guard units maintain surveillance and presence throughout India’s EEZ. Indian Navy ships positioned strategically at choke points across the length and breadth of the Indian Ocean on a near continuous basis provide ‘presence’ throughout the Indian Ocean. Seven broad areas of deployment have been identified: off the Persian Gulf and across the vital Straits of Hormuz; off the Horn of Africa and astride the key SLOCs passing through Suez and the Red Sea; off Mauritius and the Mozambique Channel; in the Central Indian Ocean, off Maldives and Sri Lanka, where almost all SLOCs passing through the Indian Ocean converge; in the

Northern Bay of Bengal; in the Andaman Sea off the Andaman and Nicobar Islands; and finally off the Malacca Straits. The Indian Navy draws sustenance from ports in countries throughout the Indian Ocean, provides reassurance, helps nations secure their EEZs, builds capacity and capability, and generates goodwill for the nation.

Coming to revisionist states, India’s strategic challenge lies in ensuring that its regional relationships prevent inimical extra-regional powers from building up a network of bases that could be used against India in the years ahead. India’s chosen strategy involves the Indian Navy at three different levels. The first focuses on enhancing influence by helping regional nations to build capacity and capability to tackle the non-conventional challenges of governing their maritime zones, as well as ensuring that a coup doesn’t topple regimes favourably inclined towards India. The second includes developing an effective voice in regional security concerns, through initiatives such as IONS as well as numerous bilateral partnerships throughout the ocean. The third involves developing the ability to deal with geopolitical challenges arising out of conflict, which may require balancing and alliances with like-minded global powers, necessitating creation of interoperability. Towards this end, the Indian Navy exercises with numerous Indian Ocean and extra-regional nations. Examples include Exercise Malabar, RIMPAC, Varuna, Indra, Konkan, Kakadu, Samudra Shakti, SIMBEX, PASSEX and many more, as well as Coordinated Patrols with Thailand, Indonesia and Myanmar in the Andaman Sea.

So if India and its navy is now deployed across the Indian Ocean, it is in pursuit of a carefully crafted strategy designed to ensure regional goodwill and the ability to be the first responder to incidents. This is why Indian Naval ships patrol the far reaches of the Indian Ocean and guard its gates, off the Cape of Good Hope and the Madagascar Channel, in the Red Sea, in the Bay of Bengal and Andaman Seas, and off the straits connecting the Indian Ocean to the Pacific in the East. Maritime patrol aircraft monitor the sea spaces to ensure that India is aware of all that is happening in its defined primary area of interest. Their deployment not only helps in familiarising seamen with their operating environment, but also generates confidence in equipment, builds maritime domain awareness and shows presence, the pre-requisite to deter non-conventional, non-state threats, as well as to build up confidence of IOR neighbours in India’s capability, showing that India is indeed acting as a net security provider for the region. Security requires cooperative effort, and the Indian Navy’s latest slogan, “Indian Navy: Mission Deployed and Combat Ready”, indicates that the Indian Navy is not just conscious of its increasing responsibilities but is also fulfilling them. ■

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# Indian Navy the Primary Instrument of India's Sea Power

“The maritime dimension of India's security and its importance to national development and economic prosperity is well recognised today and has been articulated at the highest levels by our leadership.” —Admiral Sunil Lanba, CNS

■ REAR ADMIRAL SUSHIL RAMSAY (RETD)

PRIME MINISTER NARENDRA MODI constantly and consistently to both the domestic audience as well as at the international forums has been emphatically reiterating India's vision for the Indian Ocean by enunciating the nation's commitment to the doctrine of SAGAR which is an acronym for “Security and Growth for All in the Region. This concept can be further expounded to mean, creating an enabling maritime environment through a variety of regionally acceptable measures, ranging from ensuring maritime safety and security to achieve favourable geo-political environment towards balance of power within India's neighbourhood and the maritime domain of interest to India.

The role of Indian Navy flowing from the above doctrine was most lucidly enunciated by former President Pranab Mukherjee when he said, “The Indian Navy, as the primary instrument of India's sea power, has played a pivotal role in safeguarding India's maritime interests and promoting national prosperity. The Navy has also been our nation's ambassador of goodwill and friendship across the globe. As a responsible maritime nation, it becomes incumbent upon our country to ensure peace and stability in our maritime neighbourhood. It is a matter of great pride that the Indian Navy has discharged this responsibility with complete commitment, dedication and alacrity.”

## Role of Indian Navy

The Role of Indian Navy as described in its official website states, “The full range of operations in which a nation's naval forces may be involved is vast, ranging from high intensity war fighting at one end to humanitarian assistance and disaster relief operations at the other end. This broad continuum of operations can be broken down into distinct roles, each demanding a specific approach to the conduct of operations. Accordingly, the four main roles envisaged for the Indian Navy are:

- Military Role
- Diplomatic Role
- Constabulary Role
- Benign Role

India has enormous stakes in safeguarding its 1,200 island territories, and huge Exclusive Economic Zone (EEZ) spreading over 2.4 million sq km which is how the national maritime strategy is emerging at the centre stage of national security construct.

In February 2016, Eastern Naval Command hosted the International Fleet Review (IFR), underlining Indian Navy's growing prowess and ambitions. Though it was largely a ceremonial inspection of naval warships by the Indian President, it provided an opportunity to the Indian Navy to showcase its might and rapidly expanding capabilities. It was in 2001 that an event of



PHOTOGRAPHS: US Navy



(Top) Exercise Malabar 2018 was hosted off the coast of Guam, designed to advance military-to-military coordination in a multinational environment between the US, Japan and Indian maritime forces; (above) US Sailors conduct an underway replenishment (UNREP) training exercise with the Indian Navy oiler INS Shakti (A 57) during exercise Malabar.

such a scale was last held in India and since then the Indian Navy's participating contin-

**“The Indian Navy, as the primary instrument of India's sea power, has played a pivotal role in safeguarding India's maritime interests and promoting national prosperity.”**

— Former President Pranab Mukherjee

gent has only grown bigger, with 75 front-line ships and submarines in attendance, in addition to 24 ships and delegations from over 50 nations including Australia, Bangladesh, Brazil, China, France, Indonesia, Iran, Maldives, the United Kingdom and the United States.

## The Balance Sheet

Very recently on December 3, 2018, at the Media Interaction on the eve of Navy Day 2018, Admiral Sunil Lanba, the Chief of the Naval Staff announced, “As we surge ahead in the 21st century, the attention of the entire world is focused on the Indian Ocean region, where our Navy is increasingly seen as a ‘net security provider’.” The maritime dimension of India's security and its importance to national development and economic prosperity is well recognised today and has been articulated at the highest levels by our leadership. Accordingly, our mar-

itime security strategy is aimed at providing a maritime environment that is free from all forms of traditional and non-traditional threats to our national development”.

In continuation he added that the Indian Navy has successfully completed the first deterrence patrol of INS Arihant this year. With this, we have operationalised the third and the most survivable segment of the country's nuclear triad.

## Operational Deployments

Towards thwarting the bane of piracy in the Gulf of Aden, the Indian Navy has remained steadfast and committed to curbing this global menace. Since 2008, a total of 70 Indian Naval warships have been deployed, which have safely escorted more than 3,440 (including 413 Indian flagged) ships with over 25,062 mariners embarked. So far, the Indian Navy has thwarted 44 piracy attempts and apprehended 120 pirates. Last month, one of Indian Navy's Mission deployed ships in the Gulf of Aden intercepted a suspected pirate vessel off the coast of Somalia and seized weapons and ammunition from it.

The Indian Navy has operationally achieved across the wide maritime theatre was largely due to the combat skills honed during major exercises. During 2018, Indian Navy has exercised its composite combat capability, both on the Western as well as Eastern seaboard. In addition to TROPEX 2018, operational level war gaming exercise titled SHIKSHA-18 was conducted which also included proving of joint concepts with Indian Army and Air Force.

Similarly, through active engagement with the Indian Coast Guard sharp vigil over the vast coastline including over the island territories was maintained. Through joint coastal security exercises such as Sagar Kavach and Avardhan with Indian Coast Guard, collective surveillance efforts along the coastal areas were significantly augmented.

Indian Navy's flagship Theatre Level Operational Readiness Exercise, TROPEX is scheduled from end January till early March 2019. The exercise will see participation of all operational ships, submarines and aircraft as well as units from the Indian Coast Guard. In addition, significant participation from the Indian Army and Air Force will truly enhance the integrated operations of the three Services.

In addition to TROPEX 2019 a large-scale coastal defence exercise ‘Exercise Sea Vigil’ which will involve all stakeholders across mainland and island territories has been scheduled to test the robustness of entire coastal security apparatus.

## Regional Maritime Exercises

For stable and tranquil maritime boundaries to enhance interoperability as well as to develop common understanding of the region's security challenges, numerous



regional maritime exercises with partner nations are undertaken. During 2018, the tempo of overseas deployments and maritime exercises was at an all-time high as Indian Navy was deployed for the following operational exercises/activities which enhanced interoperability and ensured security in the maritime neighbourhood as well as in the 'Global Commons':

- Participation in close to 20 exercises with friendly foreign countries.
- The participation was across a wide canvas ranging from Varuna off Reunion islands, Malabar off Guam, RIMPAC at Hawaii, Kakadu at Darwin, WPNS cum IFR at Jeju, Republic of Korea, IBSAMAR off Simons Town, South Africa, SLINEX off Trincomalee and the 25th edition of SIMBEX off Port Blair and Visakhapatnam have helped Indian Navy further enhance collaborative efforts with the navies of the Indian Ocean region and beyond.
- Under the Government of India's overall rubric of 'Neighbourhood First' policy, the Indian Navy undertook Joint EEZ patrols of Maldives, Seychelles and Mauritius, as well as Coordinated Patrols (CORPATs) with Myanmar, Thailand and Indonesia.
- Maiden bilateral exercises with UAE and Indonesia and maiden CORPAT with Bangladesh commenced during 2018.
- Indian Navy is on the cusp of commencing bilateral exercises with Bangladesh and Malaysia during 2019.

Humanitarian Assistance and Disaster Relief (HADR)

In addition to honing combat skills and forging closer ties with maritime neigh-



Admiral Sunil Lanba, CNS reviewing Indian Navy's Tropex 2017

bours and partners, Indian Navy continued to be at the forefront of humanitarian assistance and disaster relief efforts. During unprecedented floods in Kerala conducted Operation Madad was conducted, rescuing over 16,843 people and followed-up with elaborate relief and rehabilitation efforts. For the large-scale rescue efforts during Cyclone Titli that hit East Coast, personnel, relief materials and assets were synergised to provide succour to those affected by the tragedy. During 2018,

relief missions in Bangladesh, Indonesia, Sri Lanka and Mauritius were synergised to augment relief efforts.

Constructive Initiatives in IOR

Indian Ocean Naval Symposium (IONS) has emerged as the premier maritime forum of the IOR with several constructive initiatives achieving realisation through collaborative efforts. During 2017, Bangladesh Navy as the Chair of IONS initiated the first ever International Maritime Search and Res-

cue Exercise or IMMSAREX. During 2018, the following prominent initiatives were launched under the aegis of IONS:

- Formulation of guidelines for HADR in IOR and conduct of a maiden table-top exercise at Visakhapatnam.
- To commemorate the 10th anniversary of IONS at Kochi a Seminar with the theme 'IONS as a catalyst for Security and Growth for all in the Region (SAGAR)' and a Tall Ship Sail Together from Kochi to Muscat, along with Sea Riders from several IONS member states.

The 10th edition of MILAN was held at Port Blair from March 11 to 13, 2018, with a multilateral Milan Exercise Sea (MILES) with participation of 20 ships including 11 foreign naval ships making it the largest multilateral exercise held in the Andaman Sea.

The Goa Maritime Conclave commenced in 2017 with an aim to provide a dedicated apex-level forum for interactions between like-minded maritime nations of South and South Eastern IOR. The next edition of the Conclave is planned during 2019.

Information sharing among countries to enhance maritime domain awareness at the regional level has been accorded renewed impetus at the highest levels. White Shipping Information Exchange agreements with nineteen countries was concluded and operationalised. The Information Management & Analysis Centre (IMAC) has emerged as a virtual information hub for White Shipping Information in the region. An Information Fusion Centre (IFC-IOR) towards achieving collective maritime security in the IOR as an adjunct to IMAC is also being operationalised.

# Partnering India

As a founding partner of defence manufacturing in India, we extend our greetings to the Indian Navy on the 47th Navy Day. We look forward to strengthening our association through naval gun systems in the future. We wish all the Indian Navy's personnel fair winds and following seas.



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Photo credit U.S. Navy.

BAE SYSTEMS



# INEC 2018

## Innovation and Inspiration

This year’s International Naval Engineering Conference (INEC) 2018 provided a unique opportunity for naval engineers across all domains and from around the globe to convene under a single roof and debate the latest developments.

■ COMMODORE (DR) R.K. RANA (RETD)

THE OVERARCHING THEME OF the gathering, this year held at the Technology & Innovation Centre of the University of Strathclyde, Scotland, was ‘Inspiring Naval Engineering’, as exemplified by the wide-ranging and multi-stream programme planned for the three days.

Proceedings opened with an uplifting welcome by the University’s Principal & Vice-Chair Sir Jim McDonald FREng FRSE, who divulged his intimate familiarity of the subject gained during his time as Rolls-Royce Chair in Electrical Power Systems.

Technical discussions began in earnest with a presentation exploring naval combatant power system design to support future warfighting, in a joint paper by US Navy, Rolls-Royce UK and Herren Associates. Attempts to support new weapons and advanced mission systems with conventional power systems may be insufficient and could ultimately degrade mission performance. The case was argued for a ship-wide common energy storage architecture rather today’s approach that involves an unwieldy and pretty unscalable patchwork system-specific dedicated solutions.

Dr Benson from Delft University of Technology assessed how the maritime sphere might leverage developments in autonomy from other domains, such as road vehicles, aircraft and even space systems. Rather than reinventing the wheel, he sought to identify commonalities in navigation and control, energy management, and remote communication which might be adapted to naval setting with relative ease.

Stepping away from technology but remaining true to the conference’s overarching theme of inspiration, the Royal Navy’s Captain Mike Rose addressed the recruitment challenges that currently face many navies around the world. Rose described a number of STEM initiatives already underway and suggested a variety of approaches and actions to boost their efficacy and encourage more young people with an interest in engineering to consider a naval career.

After the opening plenary, the conference split into parallel sessions. The stream on submarines considered, among other topics, a solution for supporting the simultaneous yet sometimes conflicting demands and constraints for boat availability, safety and costs; and a novel approach to reconcile the design of boat surfaces and compartment partitioning being pioneered as part of the Royal Netherlands Navy’s Walrus class replacement programme.

The systems engineering stream opened with a case-study on the integration challenges of upgrading and installing new equipment on the Royal Navy’s Type 23 Frigate, which has nearly doubled its initial 18-year design life. A presentation from Rolls-Royce mapped out the systems engineering challenges, both technical and regulatory, being encountered in the development of unmanned surface vessels.



(Top) Commodore (Dr) R.K. Rana (Retd) addressing the conference; (above) Delegates at the conference.

BAE’s Andrew Edmondson meanwhile outlined a workflow for accommodating and managing the through-life design requirements of new naval platforms. The challenge is further compounded by the fact platforms may remain in operation for almost half a century and eventually be used in scenarios immeasurably different from those originally anticipated.

Applied mechanics was discussed from several perspectives. Speakers covered

ultrasonic inspection methods for detecting defects in composite repairs; remedial solutions to control excessive propeller induced hull vibrations on a landing craft; and bridging the regulatory gap between steel and fibre reinforced materials.

The sessions dedicated to the integration of electric weapons continued to be dominated by discussions on ways to deliver the immense bursts of power needed by these systems. Experts consid-

ered the problem respectively from the context of small-ship power platforms, pulse load operation, and energy storage on medium-voltage direct current grids.

With many innovators drawing inspiration from nature, it was interesting to hear the presentation on “Is there a case for emulating a fish or other sea borne creatures for propulsion of underwater vehicles?”, by Commodore (Dr) R.K. Rana, Veteran Indian Navy, who provided an overview of the development efforts by different researchers in this field and its impact on the future of naval warfare.

Day two got underway with a ten-year report card from the International Navy Safety Association (INSA), a body set up by NATO to develop a safety code for benchmarking naval ship rules and classification requirements. In addition to celebrating the code’s development, its use on a number of recent warship projects and future plans were discussed. A separate presentation considered efficient procurement for low vulnerability warships.

The stream on damage control and survivability tackled the ever-present challenge of fire-fighting in machinery spaces; the role of integrated platform management systems in handling battle damage; new thinking in signature monitoring and management to thwart – or at least understand susceptibility to – detection by enemies; using the Markov Chain, a statistical algorithm to predict possible events based on probability of prior ones, to inform platform design to reduce vulnerability.

The role of modelling and simulation in the preparations for the first flight trials aboard the Queen Elizabeth Class (QEC) aircraft carrier was described from the perspective of a collaborative research programme undertaken by industry (BAE) and academia (The University of Liverpool) to develop high-fidelity simulations of the carrier’s ‘airwake’.

Hybrid power plants returned to fore again in the session on real-time power control systems, with presentations on both the use of simulation and the application of machine learning to optimise their operation. Experts from L3 MAPPS, meanwhile, gave insights to the real-time platform management technology developed for the Royal Navy’s latest frigate, the T26 Global Combat Ship. Qinetiq’s Bill Biggs updated delegates on the next stage in the development of unmanned naval combat systems.

With immense verve and energy, John Polgaze tackled the prickly topic of environmental compliance challenges and their relevance to warship design. He hammered home the importance of asking why the rules are formulated as they are and understanding their deeper goal, rather than simply following the instructions on the can. The operational profile of warships is, he emphasised, seldom compatible with IMO regulations written for cargo ships.

The conference culminated in an awards ceremony for the Sir Donald Gosling Award, which showcased the work of young authors. ■

### INEC 2018 at a Glance

Conference Name	14th International Naval Engineering Conference, incorporating International Ship Control Systems Symposium. <a href="https://www.inec.org.uk/">https://www.inec.org.uk/</a>
Themes	INEC’s theme was ‘Inspiring Naval Engineering’ and that of iSCSS was ‘Revolutionary Technology Inspiring Ship Control’.
Organiser	Institute of Marine Engineering, Science and Technology, London, UK
Date	October 2-4, 2018
Venue	The Technology & Innovation Centre (TIC), University of Strathclyde, 99 George Street, Glasgow G1 1RD, UK;
Total no of delegates	340. (Serving naval officers, manufacturers, suppliers, consultants, and academics)
No of countries	18
Total no of refereed papers presented	more than 100



# Bilateral Indian Navy and Royal Navy Exercise Konkan-18

■ LT GENERAL NARESH CHAND (RETD)

**N**AVAL COOPERATION BETWEEN INDIA and the United Kingdom is based on the long term strategic relationship between both countries. Both Navies have, over the years, undertaken bilateral activities such as training exchanges and technical cooperation. The bilateral exercise Konkan provides a platform for the two Navies to periodically exercise at sea and in harbour, so as to build interoperability and share best practices. The Konkan series of exercises started in 2004 and since then has grown in scale. The bilateral exercise is named after the western coastal region of India and is held in rotation by both the navies. Konkan-2018 was held from November 28 to December 6, 2018, off Goa with ships participating from both the navies. The harbour phase was held from November 28 to 30 which was followed by the sea phase from December 2 to 6. The Royal Navy was represented by HMS Dragon, a Type 45 class destroyer equipped with an integral Wildcat helicopter. Commander Micheal Carter Quinn, Commanding Officer of HMS Dragon, called on Rear Admiral Philipose Pynumootil, Flag Officer Commanding, Goa Naval Area, on arrival at Mormugao



Commander Micheal Carter Quinn, Commanding Officer of HMS Dragon, calling on Rear Admiral Philipose Pynumootil, Flag Officer Commanding, Goa Naval Area, at Mormugao Port

Port. The Indian Navy fielded INS Kolkata, the first ship of latest Kolkata class destroyers, equipped with integral Seaking and an Indian Navy submarine. In addition, Indian Navy maritime patrol aircraft, Dornier also participated in the exercise.

The regular Indian Navy-Royal Navy interaction over the years has resulted in an increase in the professional content of the bilateral exercise. The thrust of the exercise this year was on anti-air warfare, anti-surface warfare, anti-submarine warfare, visit board search and seizure (VBSS) and seamanship



PHOTOGRAPHS: Indian Navy

evolutions. Konkan-2018 also featured professional interactions and sports fixtures. Konkan series of exercises are aimed at deriving mutual benefit from each others' experiences and is indicative of the continuing cooperation between the two countries. The inter-operability achieved over the years as a result of such exercises has proved to be operationally beneficial to both navies. The naval cooperation is a tangible symbol of the commitment of both nations in ensuring a positive climate at sea for enhancing strategic stability and promoting economic prosperity.

Whilst in Goa, HMS Dragon also contributed to broader India-UK ties. Representatives from India, Indian Navy and Indian industry joined their counterparts on board HMS Dragon to see how the systems on the ship enable delivery of the Royal Navy's objectives. Sir Dominic Asquith KCMG, British High Commissioner to India stated:

"Exercise Konkan is a great opportunity to reinforce the India-UK defence partnership, deepening our understanding of how our Navies can work together to counter maritime threats. This sits alongside a wide range of UK activity in Indian Ocean - covering military, multilateral and commercial engagement."

"In April this year, our Prime Ministers jointly stated that we shall "design, create and manufacture technologies ...and our security and military forces will share technologies, capabilities and equipment". This exercise, and the events taking place on HMS Dragon whilst it is in port, offer both countries a chance to further support delivery of that ambition."

On its way to the exercise, HMS Dragon intercepted a shipment of 3,048 kg of hashish in the Gulf along the 'Hashish Highway'. This route is used to transport drugs from Afghanistan to the Middle East and East Africa and onward destinations. [\[1\]](#)



## WITH BEST COMPLIMENTS

INS Kolkata

INS Kalvari

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# Naval Technologies at the Forefront

The hosting of the Maritime – Air Systems & Technology (MAST) Indo-Asia 2018 Conference in India provided a useful opportunity for gaining an insight into leading naval technologies

■ REAR ADMIRAL SUSHIL RAMSAY (RETD)

THE MARITIME/AIR SYSTEMS AND Technology Conference (MAST) – Indo-Asia, a leading global conference highlighting the latest mature and emerging naval technologies was held in India for the first time ever from November 28 to 30, 2018, in Greater Noida in Delhi NCR. Partnering with the Indian Maritime Foundation, the country's leading maritime NGO, the event showcased some path breaking technologies. These were the main focus areas for exhaustive deliberations at great length during the Conference. The participation of most global majors such as Naval Group, France, ThyssenKrupp Marine Systems, Germany, Atlas Elektronik, Italy, General Atomics, USA, MBDA, and Thales to name a few in the exhibition ensured that there was a great deal of interest and interactive discussion. The US Office of naval research participated actively and contributed significantly in the Conference and the exhibition to add great value to the event.

The MAST Conference cum Exhibition was first held in Nice in year 2006 and since then has become an annual feature at different venues. It has been held twice in Washington DC, twice in Tokyo, and once each in Rome, Genoa, Stockholm, Malmo, Gdansk and Istanbul. In 2019, it will be held in Chiba, Tokyo from June 16 to 19, 2019, and at the request of the Royal Danish Navy in Copenhagen in September 2019.

The theme for the Inaugural & Opening Session was "Global Defence – the prerogative for Partnership (Policies)". While Defence Minister Nirmala Sitharaman could not be present due to certain other official commitments, Captain Sebo Hofkamp, Royal Netherlands, Netherlands was present. Speaking on the occasion, Commodore Anil Jai Singh (Retd), the Vice President of the Indian Maritime Foundation and a MAST Technical Coordination Committee member and also the Conference Chairman highlighted the salient features of the Conference and the following significance for hosting this conference in India:

- MAST brings together technology experts from the world's leading defence OEMs in a technology-intensive environment both at the conference and the exhibition.
- Interaction with global OEMs in a smaller setting than something as vast as DefExpo would enable Indian industry to exchange ideas, find areas of convergence and get a glimpse into the latest technologies, some of which are still at a R&D stage.
- Indian medium, small and micro economies would greatly benefit; they would get an opportunity to showcase their capability to a wider global audience at a fraction of the cost than doing so abroad. Further, they could engage with these OEMs for future collaboration towards becoming part of global sup-

ply chains and a wider defence industrial eco-system.

- For Indian Naval officers involved in developing Staff Requirements and selecting equipment, this would be a golden opportunity to see equipment first-hand, interact with the technology experts of global OEMs and listen to papers covering the entire gamut of naval technology.
- DRDO scientists would benefit from this opportunity to interact and see modern equipment for themselves, particularly in areas where we have been struggling to deliver indigenous products.

This year's conference was visited by many delegates from India and abroad, naval officers and foreign Defence Attaches'. The participation by Indian industry in the exhibition was rather lukewarm perhaps due to FICCI pulling out of the sponsorship arrangements at the last moment, despite the MoU with MAST Communications, UK due to some technical reasons. This jeopardised the very conference itself and it was the resilience of the other organisations that the conference could still be held, albeit at a moderate scale.

The Conference was inaugurated by Vice Admiral Ajay K. Saxena, Controller Warship Production and Acquisition who also delivered the keynote address. He highlighted India's successful indigenisation efforts in the maritime domain and how industry could leverage the country's robust shipbuilding plan to encourage self-reliance and indigenisation.

In the Plenary Sessions that followed over the next two days, the regional maritime security scenario was discussed and how that would drive technology development and product development. Over the

three days of the event, the wide spectrum of technology papers generated very interactive sessions. The first Session on "Disruptive Technologies – Advanced Workshop Report and Roundtable" was chaired by Commodore Patrick Tyrrell (Retd), Vale Atlantic, UK. Another Session with theme "Undersea Operations and Capabilities" was chaired by George McNamara. The next session was "Unmanned Undersea Systems, chaired by Bernard Myers. Dr Sudhir Kumar Mishra, Director General Defence Research Organisation, India presided over the session on "Technology Trends" during which enlightening papers were presented by Dr Davis Kershaw, Chief, Maritime Division, DSTG, Department of Defence, Australia and by Dr Patrick A. Mason, Head Warfighter Performance Department, Office of Naval Research, USA.

There were several other interactive sessions, such as; "Undersea Sonar Sys-

**Most regulars to the Conference commented on this being perhaps the most interactive conference in terms of audience engagement on very high quality contents of the maritime security related subjects**

tems" by Dr David Wyllie; "Surface Ship Situational Awareness in the Littorals" by Rear Admiral Fusahiko Yamasaku; "Undersea Technologies" by Jeroen de Jonge, Business Director, Naval Programs, TNO Defence, Safety & Security, Netherlands; "Surface Control of the Sea Lanes" by Charles Giacchi and "Undersea Platforms" by Rear Admiral Phil Davis (Retd), Vice President and Executive Director, American Systems Corporation, USA. Commander Nitin Agarwal, Indian Navy presented his paper on "Undersea Ocean Surveillance using Submarine Cables".

Most regulars to the Conference commented on this being perhaps the most interactive conference in terms of audience engagement on very high quality contents of the maritime security related subjects.

The MAST Annual Party which is the main networking social event was also a great success. The large audience was given an exposure to India's rich cultural heritage through an outstanding Bharat Natyam performance by the renowned dancer Ragini Chandrasekhar with two of her disciples. Besides, there was traditional Indian music, dance, food and drink: a great way to unwind, whilst continuing to network, in a relaxed and enjoyable environment.

The hosting of the MAST Indo-Asia 2018 Conference in India provided a useful opportunity for gaining an insight into leading naval technologies. However, both Indian industry and the country's R&D establishment's greater participation showcasing their own technological achievements and expertise would have added value, side by side the leading defence technology companies of the world. ■

PHOTOGRAPH: ThalesAsia/twitter



Inaugural Session MAST INDO-ASIA 2018 in progress



# When Failure is not an Option: Assuring Naval Equipment Availability 24/7

PHOTOGRAPH: Thales / Terence Wallet/Marine Nationale/Défense

**T**HE NAVAL BATTLE GROUP had reached its destination, now in position to intercept its target, a pirate ship headed to hijack a cargo tanker off the African coast.

All was ready until a red alert signalled a potential electronic warfare system failure in the lead frigate. So the imminent operation planned for weeks had to be postponed.

Can anything be done to avoid even the best naval equipment becoming unavailable, especially when it counts most?

In fact, this scenario is becoming a thing of the past with the digital technologies that Thales is providing to naval forces to assure availability through equipment reliability, predictive maintenance, and spare parts and fleet management.

## Making Sure That Naval Equipment is Always On, Everywhere

"No matter where and no matter what it takes, in crises or normal operations, Thales is making sure that navies can count on the availability of their equipment," says Patrice Lacroix, Strategy & Marketing Director at Thales Defence Mission Systems. "That continuous commitment means that we are truly partners in assuring the reliability on which



navies need to depend --- both to accomplish their complex and difficult missions as well as to defend themselves at all times."

The process starts with designing equipment for continuous service, Lacroix explains. This involves building into radars, optronics, and electronic warfare equipment the sensors needed for continuous collection of data for HUMS, the Health and Usage Monitoring System. In this way, data is continuously monitored, collected, and analysed by artificial intelligence.

Navy operational staff first selects the vital equipment that is needed for mission success and then Navy maintenance staff can issue alerts to out of line situations that require maintenance—before failure.

## Continuous Monitoring Creates a Fail-safe Partnership

That continuous monitoring in itself creates real teamwork between Thales and the equipment users—the naval forces themselves. The result is a total understanding

of the equipment and its management for optimal efficiency and effectiveness. And the natural consequence is pro-active quality control for naval equipment that must withstand long periods of often intense and fast-moving operation, with extremes of weather, temperature and water, if not unfriendly fire.

Thales' smart technologies and algorithms assure equipment availability through continuous improvement in understanding equipment reliability and predictive maintenance.

"Through the use of digital technologies and data management, Thales today is part of a virtuous cycle that is revolutionising naval equipment availability, by assuring electronics reliability through precision predictive maintenance," explains Patrice Lacroix, "Thales expertise in applying Big Data, artificial intelligence, the Internet of Things and Cybersecurity to the digital transformation of supply chain management, as well as our long experience in naval electronics, makes us valued partners for the navies all over the world. They know that they can count on us—and, so, on their equipment—any time and any place for that critical success factor in their vital 24/7 missions."

*Article contributed by Thales*



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# Singapore-India Maritime Bilateral Exercise 2018

The Silver Jubilee edition of SIMBEX 2018 was largest since 1994 in terms of scale and complexity and its Commemoration Ceremony was held onboard INS Sahyadri at Visakhapatnam on November 19, 2018

■ REAR ADMIRAL SUSHIL RAMSAY (RETD)

**T**HERE IS UNIQUENESS IN the time-tested bilateral Singapore-India Maritime Exercise (SIMBEX) which has recently commemorated the 25th edition in the form of SIMBEX 2018. On November 10, 2018 SIMBEX 2018 commenced with the participation of frontline ships of the Indian Navy's Eastern Fleet and those of the Republic of Singapore Navy (RSN) in the ocean adjoining the Andaman and Nicobar Islands and Bay of Bengal. The participating ships from both sides arrived at Port Blair on November 10, 2018 with much fanfare. Genesis of SIMBEX can be traced back to 1994 when the participating Units from both sides were engaged in Basic Anti-Submarine Warfare exercises. Over the past two decades and more these exercises have transformed into complex and intricate maritime combat drills including missile and torpedo firings and on-shore extensive professional exchanges in the form of seminars, conferences, sports, cultural exchanges, etc.

Under the aegis of Tri-Services, Andaman & Nicobar Command preliminary exercises coordination, briefings, presentations, etc. were conducted for the crew of the participating warships and the Maritime Reconnaissance Aircraft and integral helicopters at Port Blair. During the harbour phase, in addition to operational conferences towards preparation of the sea phase of the exercises in the Andaman Sea and Bay of Bengal, courtesy calls by both sides on the Senior Officers were made. In addition, Subject Matter Expert Exchanges (SMEE) were also scheduled. The SMEEs have over the years provided a platform to formally exchange best practices of respective navies so that learning and improvement never ceases.

## Indian Fleet

The Indian Navy was represented by the Ranvir class Destroyer - INS Ranvijay, two Project 17 Multi-role Stealth Frigates - INS Satpura and INS Sahyadri, the Project 28 ASW Corvette - INS Kadmat, the Project 25A Missile Corvettes, INS Kirch, the Off-shore Patrol Vessels INS Sumedha and INS Sukanya, the Fleet Support Ship, INS Shakti, a Sindhughosh Class Submarine, INS Sindhukirti, the P-8I Long Range Mari-

**Over the past two decades and more these exercises have transformed into complex and intricate maritime combat drills including missile and torpedo firings and on-shore extensive professional exchanges**



PHOTOGRAPHS: Indian Navy



(Top) Dr Ng Eng Hen, Defence Minister of the Republic of Singapore with Admiral Sunil Lanba, CNS; (middle) Flag Officer Commanding in Chief, Eastern Naval Command Vice Admiral Karambir Singh exchanging a memento with his Singaporean counterpart; (above) Harbour Phase of SIMBEX 2018 commences with Ops Conferences.

time Patrol and ASW aircraft from INAS 312, Dornier 228 Maritime Patrol aircraft from INAS 311, Mk 132 Hawk AJTs from INAS 551 and integral helicopters such as the UH3H, Seaking 42B, Seaking 42C and Chetak Utility helicopters.

## Singaporean Fleet

The Singapore Navy was represented by two Formidable Class Stealth Frigates - RSS Formidable and RSS Steadfast, one Littoral Mission Vessel - RSS Unity, two Missile Corvettes, RSS Vigour and

RSS Valiant, an Archer class Submarine, RSS Swordsman, 'Swift Rescue' a Deep-Sea Rescue Vehicle (DSRV), a Fokker F50 Maritime Reconnaissance aircraft, embarked S-70B helicopters and ScanEagle unmanned aerial systems.

Maritime Patrol Aircraft of both countries - the versatile P-8I of the Indian Navy and Fokker F50 from Singapore operated from Naval Air Station, Port Blair. Local Flotilla ships of the Andaman & Nicobar Command sanitised the approaches to the harbour and the adjoining seafloor including the exercise areas to ensure security of the maritime forces for the smooth conduct of the exercises.

## Sea Phase

The sea phase of SIMBEX 2018 was steered under Commander Task Group of Joint Forces, Rear Admiral Dinesh K. Tripathi, Flag Officer Commanding, Eastern Fleet. Senior Lieutenant Colonel Ho Jee Kien, Commanding Officer of 188 Missile Corvette Squadron led the RSN during the first sea phase as the Deputy Task Group Commander.

## Key Highlights of SIMBEX 2018

- The Silver Jubilee edition of SIMBEX 2018 was largest since 1994 in terms of scale and complexity.
- The initial harbour phase was held at Port Blair from November 10-12, 2018, followed by sea phase from November 12-16, 2018 in the Andaman Sea.
- The second harbour phase was held from November 16-19, 2018 at Visakhapatnam.
- The harbour phase included programmes such as Silver Jubilee commemoration, various professional and training interactions, 10 Km 'Friendship Run' during the Annual Visakhapatnam-Navy Marathon, social evening and joint cultural programmes.
- The final sea phase was held in the Bay of Bengal from November 19-21, 2018.
- The SIMBEX 2018 witnessed a diverse range of exercises at sea ranging from live weapon drills including multiple missile firings, Heavy Weight Torpedo (HWT) and medium range gun/ anti-submarine rocket firings, advanced Anti-Submarine Warfare (ASW) exercises, submarine rescue demonstrations, integrated Surface and Anti-Air Warfare (AAW), Unmanned Aerial Vehicle (UAV) operations and cross deck helicopter flying among others.

## Silver Jubilee Commemoration

Silver Jubilee Commemoration Ceremony was held onboard INS Sahyadri at Visakhapatnam on November 19, 2018. The Ceremony was attended by Admiral Sunil Lanba, CNS and Rear Admiral Lew Chuen Hong, Chief of Navy Republic of Singapore, Vice Admiral Karambir Singh Flag Officer Commanding-in-Chief, Eastern Naval Command, Flag Officers, Commanding Officers and personnel from participating ships.

Continued on page 20...



# INDRA NAVY 18

## A Report

Maritime exercise INDRA NAVY 18 – Indo-Russia Joint Maritime Exercise – has achieved yet another milestone in strengthening maritime security cooperation between the two navies and served to reinforce the long standing bond of friendship between India and Russian Federation.

PHOTOGRAPHS: Indian Navy



INDRA NAVY 18 the 10th edition of the exercise provided another opportunity to both the navies to operate with each other and exchange best practices



■ REAR ADMIRAL SUSHIL RAMSAY (RETD)

**T**HE MAIN AIM OF the 10th edition of the bi-lateral joint maritime exercise INDRA NAVY 18 between Indian Navy and Russian Federation Navy was to increase inter-operability amongst the two navies, develop common understanding and procedures for maritime security operations.

During his visit to the Russian Federation during November 2018, Admiral Sunil Lanba, Chief of the Naval Staff had focussed on consolidating time tested bilateral defence relations between the two countries and to explore new avenues for defence cooperation.

Recently concluded bilateral maritime exercise INDRA NAVY 18 has substantially contributed towards strengthening mutual confidence, inter-operability, as also enabled sharing of best practices between the two navies. Maritime exercise INDRA NAVY 18 has achieved yet another milestone in strengthening maritime security cooperation between the two navies and served to reinforce the long standing bond of friendship between India and Russian Federation.

INDRA NAVY 18 was conducted from December 9 to 16, 2018, in the Bay of Bengal. Russian Federation Navy (RuFN) Ships Varyag, Admiral Panteleyev and Boris Butoma participated in INDRA NAVY 18.

The Indian Navy was represented by INS Ranvir, a Guided Missile Destroyer, INS Satpura, an indigenous Guided Missile Frigate, INS Kadmat, an indigenous Anti-Submarine Warfare Corvette, Indian Navy Ships Kuthar and Khanjar both indigenous Guided Missile Corvettes and INS Jyoti, a fleet tanker. In addition, one Sindhughosh class submarine, Dornier maritime patrol aircraft, Hawk fighter aircraft and other integral rotary wing helicopters participated in the exercise.

The Indian Navy's participating Task Force was under the Command of Rear Admiral Dinesh K. Tripathi, Flag Officer Commanding, Eastern Fleet. Ships of the Russian Federation Navy (RuFN) were under the Command of Rear Admiral Mikhailov Edward Evgenievich, Chief of the Headquarters, Submarine Forces, Pacific Fleet and ships from the Pacific Fleet, all based at Vladivostok.

INDRA NAVY series of bilateral maritime exercises which commenced during 2003 have evolved and flourished in its contents, scope, complexity and level of participation, substantially. INDRA NAVY 18 was held in two phases. The Harbour Phase was held at Visakhapatnam from December 9 to 12, 2018, and comprised planning conferences, professional interactions, cultural visits, sports fixtures and formal calls between Flag Officers and Senior Officers of participating navies. The Sea Phase was conducted in the Bay

of Bengal from December 13 to 16, 2018. The main thrust of exercises during Sea Phase was on Anti Submarine Warfare, Air

Defence drills, Surface Firings, Visit Board Search and Seizure operations and tactical procedures. ■



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01 Fishing Survey Vessel

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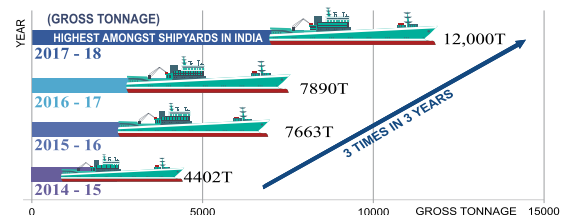
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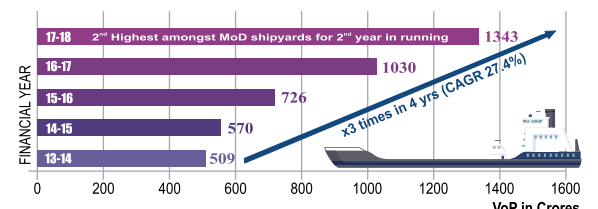
### ANNUAL DELIVERY



### STRONG FINANCIALS

Particulars	FY 14	FY 15	FY 16	FY 17	FY 18	Increase in last 4 years
Revenue	553	681	805	1102	1452	163%
Profit before Tax	-63	53	111	177	331	625%
Return on Average Capital Employed (ROCE) (%)	-7%	8.2%	13.3%	17.3%	26.6%	33.6%

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Singapore-India Exercise 2018... continued from page 18

## Joint Statement by Defence Minister Nirmala Sitharaman and Minister of Defence of the Republic of Singapore Dr Ng Eng Hen

**T**HE 3RD DEFENCE MINISTERS' Dialogue (DMD) between India and Singapore was successfully concluded on November 22, 2018. The DMD commenced after both countries signed the revised Defence Cooperation Agreement (DCA) in 2015 to further strengthen the long standing defence relationship between the Singapore Armed Forces (SAF) and the Indian Armed Forces.

Of particular significance during this meeting was the renewal of the Bilateral Agreement for the conduct of Joint Army Training and Exercises in India. This agreement gives out an exhaustive framework for the conduct of joint training as well as exercises for the Singapore Armed Forces in India and will further strengthen the cooperation between the two Armed Forces.

Dr Ng attended the final sea phase of the 25th edition of the Singapore-India Maritime Bilateral Exercise - SIMBEX on board INS Shakti. This multi-dimensional exercise witnessed participation of ships, submarines as well as aircraft from both sides and live firings at sea. Both Ministers complimented all personnel participating in the milestone event and for making it a success which is a testament of the long standing ties between the armed forces of the two countries.

Both Ministers commended the conclusion of the Navy Implementing Arrangement Concerning Mutual Coordination, Logistics and Services Support in June 2018, which together with the Navy Bilateral



Defence Minister Nirmala Sitharaman with Singapore Defence Minister Dr Ng Eng Hen

Agreement concluded in November 2017, have expanded and deepened bilateral naval cooperation.

Dr Ng expressed appreciation for Indian Prime Minister Narendra Modi's Keynote Address at the 2018 Shangri-La Dialogue, wherein Prime Minister Modi articulated India's vision for the Indo-Pacific region. In this regard, Singapore strongly supports India's deep engagement with ASEAN member states participation in patrols along the Straits of Malacca with Singapore and looks

forward to a inaugural conduct of the trilateral maritime exercise with Thailand in the Andaman Sea.

Sitharaman affirmed India's full support and active participation in the regional security architecture of the ASEAN Defence Ministers' Meeting (ADMM)-Plus and its many initiatives. As an ADMM Plus member, India supports the adoption of the Guidelines for Air Military Encounters.

As littoral countries astride key sea lines of communication, the ministers

underscored the importance of maintaining freedom of navigation and overflight consistent with international law, including the United Nations Convention on the Law of the Sea.

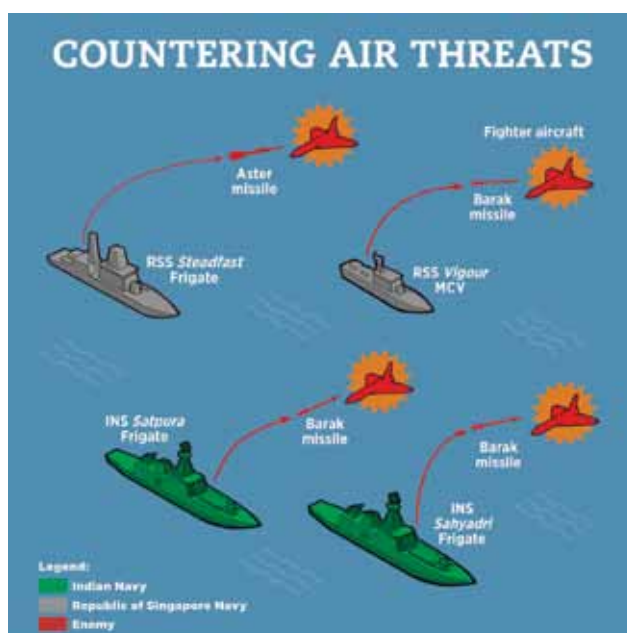
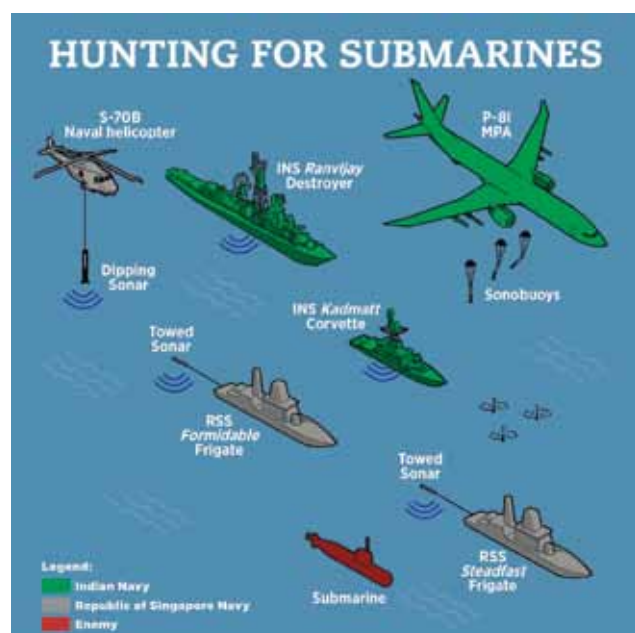
Sitharaman reaffirmed India's belief that disputes should be resolved through peaceful means, and in accordance with the universally recognised principles of international law. Both Ministers agreed on the importance of international cooperation in tackling transnational security threats and in particular measures to collectively tackle the threat of terrorism.

Both ministers agreed to step up intelligence and information sharing, particularly in the areas of maritime security and counter-terrorism and expand collaboration on submarine safety and rescue.

Ministers also commended the progress in defence technology collaboration under the auspices of the India-Singapore Defence Technology Steering Committee and the India-Singapore Defence Industry Working Group. These joint R&D collaborations included areas such as combat care and vehicle armour.

The ministers expressed satisfaction at the deepening defence ties between India and Singapore and reaffirmed their commitment to support further initiatives that would promote stability to the region. It was also agreed to hold the 4th DMD in Singapore during 2019 on mutually convenient dates. ■

GRAPHICS: MoD Singapore / twitter



Rear Admiral Dinesh K. Tripathi, Flag Officer Commanding Eastern Fleet welcomed the Guests to the historic occasion to commemorate the Silver Jubilee. Admiral

**Admiral Sunil Lanba, CNS hosted Rear Admiral Lew Chuen Hong, Chief of Navy of the Republic of Singapore Navy and officials from Defence Ministries of both the nations with the Defence Ministers**

Sunil Lanba highlighted that SIMBEX is the longest and un-interrupted bilateral maritime exercise that India has had with any other navy. The importance of this achievement was also flagged by the Prime Minister at the Shangri La Dialogue in June 2018. CNS also reiterated that naval cooperation through SIMBEX underscores the shared commitment of both nations to security, safety and freedom of navigation and overflight in the global commons. CNS pointed that while the motto of the Republic of Singapore Navy 'Beyond Horizon', the motto of the Indian Navy is 'Shano No Varuna' which translates to 'May the Ocean Gods be Auspicious unto Us'.

Rear Admiral Lew Chuen Hong, Chief of Navy, Republic of Singapore Navy, referred to the historic maritime links through maritime trade of both countries dating back to 3rd and 4th century. He brought out that Singapore and India are like minded coun-

tries that share similar outlook towards preserving freedom of sea following rules and norms laid down in United Nations Convention on the Law of the Seas. He highlighted the special relations that both navies have through substantive interactions. Corner stone for Navy-Navy relations is SIMBEX which started as a basic anti-submarine exercise in 1994 as 'Lion King' and has grown from strength to strength.

To mark the historic occasion and as a symbol of growing trust and comfort levels between the two navies, a special Logo was also released. The occasion was also utilised to simultaneous release Special Postal Cover and Singaporean Postage Stamp on SIMBEX.

**Singapore Defence Minister witnesses SIMBEX 2018 at Sea**

Dr Ng Eng Hen, Defence Minister of the Republic of Singapore closely observed the two navies in action at sea during the

25th Edition of SIMBEX 2018 in the Bay of Bengal on November 20, 2018. Admiral Sunil Lanba, CNS hosted Rear Admiral Lew Chuen Hong, Chief of Navy of the Republic of Singapore Navy and officials from Defence Ministries of both the nations who accompanied the Defence Minister.

On arrival onboard Indian Navy's Flag Ship INS Shakti, Dr Hen was briefed on the exercises - those completed and those underway. The Defence Minister had the occasion to witness successful missile engagements of aerial targets by ships of the two navies, ASW rocket firings, medium calibre gun engagements, flying operations and a steam past by participating ships and Indian Navy Hawk jet fighters. In an unmistakable and emphatic sign of the close extent of friendship between the two countries, the Defence Minister received salutes onboard Flag Ship, INS Shakti as ships and aircraft from both the navies steamed and flew past. ■





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# News in Brief

## DEEP SEA SUBMARINE RESCUE SYSTEM INDUCTED INTO THE INDIAN NAVY AT MUMBAI



Indian Navy's first flyaway Deep Sea Submarine Rescue System was formally inducted by Admiral Sunil Lanba, Chief of the Naval Staff, at the Naval Dockyard, Mumbai. Aquisition of this capability is a significant and pioneering jump in the Indian Navy's capability in deep submarine rescue.

The Indian Navy's Deep Sea Submarine Rescue System considered to be the most advanced system currently in operation globally, is capable of undertaking rescue from a disabled Submarine upto 650 m depth. The DSRV, which is operated by a crew of three, can rescue 14 personnel from a disabled Submarine at one time and can operate in extreme sea conditions (upto Sea State 6).

## EXTENDED RANGE 127MM CALIBRE GUNS FOR INDIAN NAVY

The Defence Acquisition Council (DAC) is the highest decision making apparatus of the Ministry of Defence for capital procurements of the military hardware and is headed by the Defence Minister Nirmala Sitharaman.

The DAC has recently cleared the procurement thirteen 127mm calibre gun systems for the Indian Navy at a coat of ₹3,000 crore from BAE Systems of the United States.

These guns are a long outstanding requirement of the Indian Navy and would be procured from BAE Systems under the Buy (Global) category of the Defence Procurement Procedure at an approximate cost of over ₹3,000 crore. These guns will be fitted on board new surface combatants to counter military engagements at sea. These guns will enable naval ships to provide fire support and engagement of targets on the land, as well. Naval Gun Fire Support (NGFS) is vital operation undertaken for softening of hostile Beaches in a classic amphibious assault to facilitate safe landings of own amphibious assault units launching combatants, armoured vehicles, weapons, etc.

These guns have a range of 24 km, which could be extended further by using a different type of ammunition called Extended Range Gun Munitions (ERGM). These guns are installed on board surface ships and are used by the US Navy and primarily used in conflict zones where firing a surface to surface missiles are not viable.

## IAI TO PROVIDE \$777 MILLION WORTH OF BARAK-8 LRSAM FOR THE INDIAN NAVY



Israel Aerospace Industries (IAI) has announced on October 24 that it has been awarded an additional, \$777-million mega-contract for supply of Long Range SAM (LRSAM) Air and Missile Defence (AMD) System (the marine version of the AMD system Barak-8) for seven ships of the Indian navy. The contract was signed with Bharat Electronics Limited (BEL) which serves as the main contractor in the project. The LRSAM system, part of the Barak-8 Family, is an operational AMD system used by Israel's navy as well as by India's Navy, Air Force and Army. It provides broad air and point defense against a wide range of threats to the ships from the air, sea or land. The system integrates several advanced state-of-the-art systems as, digi-

tal radar, command and control, launchers, interceptors with modern RF seekers, data link and system-wide connectivity. Barak-8 AMD system was developed by IAI in collaboration with Israel's MoD and India's Defense Research and Development Organization, the navies of both countries, IAI's ELTA Group, RAFAEL and local industries in India and Israel.

## RUSSIA TO BUILD FIRST TWO FRIGATES FOR INDIA IN THREE YEARS

The Project 11356 or Talwar class frigates are a class of guided missile frigates designed and built by Russia for the Indian Navy. They are improved versions of the Krivak III class (Project 1135) frigates used by the Russian Coast Guard. Head of Russia's United Shipbuilding Corporation Alexei Rakhmanov told reporters on November 23 that the first two Project 11356 frigates for India will be built in three years. Russia and India had earlier signed a contract for the construction of four Project 11356 frigates. Two of them are planned to be built at the Yantar Shipyard in Russia's Kaliningrad, while the other two will be constructed at India's Goa Shipyard Limited (GSL). Project 11356 frigates are designed for attacking enemy surface ships and submarines and repelling air attacks independently or in cooperation with other ships in a naval task force. The frigates are armed with 100-millimetre artillery gun A-190, Kalibr and Shtil missiles and torpedoes.

## APPOINTMENTS

- **Rear Admiral G.K. Harish** has been appointed as Director General Naval Design (Surface Ship Group).
- **Commodore A.P. Kulkarni** on promotion to the rank of Rear Admiral has been appointed as Admiral Superintendent Yard, Karwar.
- **Commodore M.N. Menon** on promotion to the rank of Rear Admiral has been appointed as Director General Naval Design (Submarine Design Group).
- **Commodore B. Sivakumar** on promotion to the rank of Rear Admiral has been appointed as Additional Director General (Technical), Project Seabird.
- **Commodore G.K. Garg** on promotion to the rank of Rear Admiral has been appointed as Assistant Chief of Personnel (Administration & Civilians).
- **Surgeon Rear Admiral Joy Chatterjee** has been appointed as Command Medical Officer, Southern Naval Command.
- **Surgeon Rear Admiral Guruswamy Viswanath** has been appointed as Additional Director General of Medical Services (Navy).
- **Rear Admiral Narayan Prasad** on promotion to the rank of Vice Admiral has been appointed as Director General Naval Project, Visakhapatnam.
- **Vice Admiral A.K. Saxena**, Director General Naval Project, Mumbai has been appointed as Controller Warship Production & Acquisition.
- **Rear Admiral S. Naithani**, Admiral Superintendent Naval Dockyard, Mumbai on promotion to the rank of Vice Admiral has been appointed as Director General Naval Project, Mumbai.
- **Rear Admiral G. Srinivasan** has been appointed as Admiral Superintendent Dockyard, Mumbai.
- **Rear Admiral R. Swaminathan**, Assistant Chief of Material (Modernisation) has been appointed as Assistant Chief of Material (Dockyards & Repairs).
- **Rear Admiral Amit Bose** has been appointed as Assistant Chief of Material (Modernisation).
- **Rear Admiral K.M. Deshmukh** has been appointed as Admiral Superintendent has been appointed as Admiral Superintendent Naval Dockyard, Mumbai.
- **Commodore Sanjay Datt** on promotion to the rank of Rear Admiral has been appointed as Chief Staff Officer (Technical), Eastern Naval Command.
- **Commodore Arian George** on promotion to the rank of Rear Admiral has been appointed as Additional Director General Quality Assurance (WP).
- **Commodore C. Kamalak Kannan** on promotion to the rank of Rear Admiral has been appointed as Assistant Chief of Material (Nuclear Submarines).
- **Surgeon Rear Admiral Ravi Kalra**, Additional Director General Medical Services (Navy) on promotion to the rank of Surgeon Vice Admiral has been appointed as Director & Commandant, Armed Forces Medical College, Pune.
- **Surgeon Vice Admiral Anup Banerjee** on secondment to the Indian Navy has been appointed as Director General Medical Services (Navy).

## » SHOW CALENDAR

29-31 January, 2019

### Surface Warships

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<https://surfacewarships.iqpc.co.uk>

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A large amphibious aircraft, the US-2i, is shown in flight over a body of water. The aircraft is white with blue and red accents on the propellers and landing gear. It has four large propellers and two sets of landing gear. The text "US-2i" is overlaid in a large, stylized font above the aircraft.

# US-2i

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