

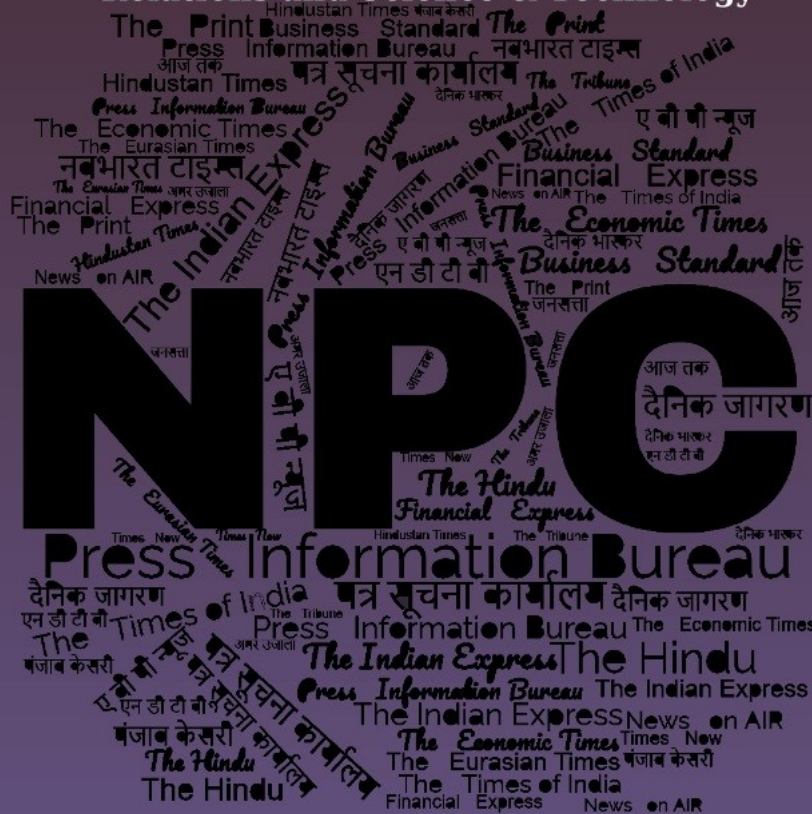
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# समाचार पत्रों से चयनित अंश Newspapers Clippings

डीआरडीओ समुदाय को डीआरडीओ प्रौद्योगिकियों, रक्षा प्रौद्योगिकियों, रक्षा नीतियों, अंतर्राष्ट्रीय संबंधों और विज्ञान एवं प्रौद्योगिकी की नूतन जानकारी से अवगत कराने हेतु दैनिक सेवा

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology



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# नवभारत टाइम्स

Tue, 30 July 2024

## रक्षा क्षेत्र में 'विवादित' सुधारों पर आखिरी फैसला लेने वाली है सरकार, **DRDO** की बदलेगा ढांचा! जानें डीटेल

मोदी सरकार देश के रक्षा क्षेत्र में अहम फैसले लेने जा रही है। इनमें एक काम उच्चस्तरीय एक्सपर्ट समिति की तरफ से प्रस्तावित डीआरडीओ के बहुप्रतीक्षित स्ट्रक्चरल और फंक्शनल रिफॉर्म्स का है। इस दिशा में काम शुरू हो गया है। इसके साथ ही केंद्र सरकार भी जल्द ही देश में एक मजबूत डिफेंस रिसर्च एंड डेवलपमेंट इकोसिस्टम और इंडस्ट्रियल बेस बनाने की ओवरऑल पॉलिसी के तहत कुछ 'विवादास्पद' सिफारिशों के कार्यान्वयन पर अंतिम फैसला लेने वाली है। माना जा रहा है कि डिफेंस फील्ड में प्राइवेट सेक्टर के लिए व्यापक रूप से एंट्री का रास्ता खुल सकता है।

डीआरडीओ ने सुझाया रास्ता

सरकारी सूत्रों ने हमारे सहयोगी अखबार टाइम्स ऑफ इंडिया को बताया कि रक्षा अनुसंधान एवं विकास संगठन ने प्रधानमंत्री कार्यालय की तरफ से संचालित प्रोफेसर के विजय राघवन की अगुवाई वाली एक्सपर्ट समिति की तरफ से सुझाए गए 'लगभग 60% प्रमुख सुधारों' पर सहमति व्यक्त की है। इन्हें अब चरणबद्ध तरीके से लागू किया जा रहा है और उनके लिए समय सीमा निर्धारित की गई है। सरकार बाकी बचे सुधारों पर भी अंतिम निर्णय लेगी, जो डीआरडीओ की तरफ से उन्हें प्राप्त करने के लिए समिति द्वारा सुझाए गए 'मार्ग' का कड़ा विरोध करने के बाद विवादास्पद हो गए थे। एक सूत्र ने कहा कि डीआरडीओ ने इन सुधारों के लिए एक वैकल्पिक मार्ग या तंत्र का सुझाव दिया है।

चीफ ऑफ डिफेंस स्टाफ वाली वर्किंग कमेटी

समिति की 'रिडिफाइनिंग डिफेंस रिसर्च एंड डेवलपमेंट' हेडिंग वाली रिपोर्ट में डीआरडीओ में आमूलचूल परिवर्तन की बात कही गई है। इसमें संगठन की कमियों को दूर करने के साथ ही इस बात पर जोर दिया गया है कि इसे मुख्य रूप से मौलिक एवं अनुप्रयुक्त रिसर्च और डेवलपमेंट पर ध्यान केन्द्रित करना चाहिए। सिस्टम इंटीग्रेशन एवं प्रोडक्ट मैनेजमेंट को अन्य एजेंसियों एवं प्राइवेट सेक्टर पर छोड़ देना चाहिए। प्रधानमंत्री के नेतृत्व वाली डिफेंस टेक्नोलॉजी काउंसिल (डीटीसी) को देश के रक्षा रिसर्च एंड डेवलपमेंट एवं टेक्नोलॉजी रोडमैप के साथ-साथ उन प्रमुख परियोजनाओं पर निर्णय लेना चाहिए, जिन्हें आगे बढ़ाने की आवश्यकता है। समिति ने कहा कि रक्षा मंत्री एवं राष्ट्रीय सुरक्षा सलाहकार के उपाध्यक्ष के रूप में डीटीसी में चीफ ऑफ डिफेंस स्टाफ की अध्यक्षता में एक सशक्त कार्यकारी समिति होनी चाहिए।

डीआरडीओ में बड़े बदलाव

डीआरडीओ को अपनी 41 लैब्स को 10 नेशनल लैब्स में रिस्ट्रक्चर करना चाहिए ताकि "काम के तालमेल और एफिशिएंसी में सुधार" हो सके। इसके साथ ही पांच नेशनल टेस्ट फैसिलिटी भी होनी चाहिए। एक अधिकारी ने कहा कि सात टेक्नोलॉजी ग्रुप का मौजूदा सिस्टम, जिनमें से प्रत्येक का नेतृत्व एक महानिदेशक करता है, उपयुक्त रूप से काम नहीं कर रही है। रक्षा अनुसंधान एवं विकास के मौजूदा विभाग की जगह डिफेंस साइंट, टेक्नोलॉजी और इनोवेशन (डीडीएसटीआई) का एक नया विभाग स्थापित करने का भी प्रस्ताव है। इसमें सचिव डीडीआरएंडडी-सह-डीआरडीओ चेरमैन पोस्ट का बंटवारा किया जाएगा।

डीआरडीओ के प्रोजेक्ट में देरी

डीआरडीओ, जिसका 2024-25 के केंद्रीय बजट में 23,855 करोड़ रुपये खर्च करने का प्रावधान किया गया है। इसको पिछले कुछ वर्षों में एडवांस वेपन सिस्टम के डेवलपमेंट में भारी खर्च और अधिक समय के लिए तीखी आलोचना का सामना करना पड़ा है। यह "मिशन मोड प्रोजेक्ट्स (एमएमपी) के लिए बार-बार एक्सटेंशन की मांग भी कर रहा है। ये स्पेशल ऑपरेशन सैन्य जरूरतों पर आधारित हाई प्रायोरिटी वाले कार्यक्रम हैं। इन्हें निश्चित समय सीमा के भीतर पूरा किया जाना चाहिए। रक्षा मंत्रालय ने पिछले वर्ष संसद को बताया था कि डीआरडीओ की 55 एमएमपी में से 23 में देरी हो गई है। इनमें ऐसी टेक्नोलॉजी शामिल हैं जो भारत या विदेश में पहले से ही उपलब्ध और आसानी से उपलब्ध हैं।

एडवांस वेपन सिस्टम डेवलप करना होगा

एक टॉप अधिकारी ने कहा कि एडवांस मानवरहित युद्ध, एआई, हाइपरसोनिक हथियार, साइबर और स्पेस वॉर के इस युग में, भारत को डीआरडीओ, एकेडमिया, प्राइवेट सेक्टर और सशस्त्र बलों के साथ मिलकर 'एक पूरे राष्ट्र' के दृष्टिकोण की आवश्यकता है। उन्होंने कहा कि भारत को एडवांस वेपन सिस्टम को डिजाइन करने, डेवलप करने और मैनुफैक्चर करने की क्षमता के साथ एक मजबूत नेशनल इकोसिस्टम बनाने की आवश्यकता है। कोई भी देश आपको अत्याधुनिक तकनीक नहीं देगा।

<https://navbharattimes.indiatimes.com/india/drdo-overhaul-modi-govt-will-take-final-call-on-contention-reforms-in-defence-ecosystem/articleshow/112127292.cms>

## THE TIMES OF INDIA

Tue, 30 July 2024

### **DRDO overhaul on course, government to also take final call on 'contentious' reforms**

The much-needed structural and functional revamp of DRDO proposed by a high-powered expert committee is now on course, with the Union government also set to soon take a final call on the implementation of some "contentious" recommendations, as part of the overall policy to build a strong defence R&D ecosystem and industrial base in the country.

Defence Research and Development Organization has agreed to "around 60% of the major reforms" recommended by PMO-driven Prof K Vijay Raghavan-led expert committee, which are now being implemented in a phased manner with deadlines set for them, government sources told TOI. "Government will take the final decision on the remaining reforms, which became contentious after DRDO strongly opposed the 'route' recommended by the committee to achieve them.

While agreeing with the overall thrust, DRDO has suggested an alternate path or mechanism for them," a source said. The committee's report titled 'Redefining Defence R&D' calls for a complete overhaul of DRDO, slashing the flab and stressing the need for it to mainly concentrate on fundamental and applied R&D, leaving systems integration and product management largely to other agencies and private sector, as reported by TOI earlier.

A PM-led defence technology council (DTC) should decide the country's defence R&D and technology roadmap as well as the major projects that need to be pursued. With the defence minister and the national security advisor as vice-presidents, the DTC should have an empowered executive committee chaired by chief of defence staff, the committee stated. DRDO should restructure its 41 labs into 10 national labs to "improve functional synergy and efficiency", along with five national test facilities. "Existing system of seven technology clusters, each headed by a DG, is not working optimally," an official said.

There is also the proposal to set up a new department of defence science, technology and innovation (DDSTI) to replace the existing department of defence R&D, with bifurcation of the

secretary DDR&D-cum-DRDO chairman post. DRDO, which has an outlay of Rs 23,855 crore in the 2024-25 Union Budget, has faced scathing criticism for huge cost and time overruns in developing advanced weapon systems over the years. It has even been seeking repeated extensions for "mission mode projects (MMPs)", which are high priority programmes based on specific operational military requirements that must be completed within definite timeframes.

The defence ministry told Parliament last year that 23 of the 55 MMPs of DRDO, which involve technologies that are already available and readily accessible in India or abroad, had been delayed. "In this era of advanced unmanned combat, AI, hypersonic weapons, cyber and space warfare, India requires a 'a whole of nation' approach, with DRDO, academia, private sector and the armed forces all coming together," a top official said. "India needs to build a strong national ecosystem with the capability to design, develop and manufacture advanced weapon systems. No country will give you cutting-edge technologies," he added.

<https://timesofindia.indiatimes.com/india/drdo-overhaul-on-course-government-to-also-take-final-call-on-contentious-reforms/articleshow/112118013.cms>

## Defence News

## Defence Strategic: National/International



**Press Information Bureau**  
**Government of India**

**Ministry of Defence**

*Mon, 29 July 2024*

### **MoD & NSE ink MoU to facilitate capital market access to MSMEs**

Ministry of Defence and National Stock Exchange of India Limited (NSE), on July 29, 2024, signed a Memorandum of Understanding (MoU) to facilitate capital market access to the MSMEs. The MoU was signed by Additional Secretary, Department of Defence Production (DDP) and Managing Director, NSE in the presence of Defence Secretary Shri Giridhar Aramane. The MoU intends to facilitate MSMEs in the defence sector to raise productive capital for their growth plan in an efficient and transparent manner through NSE platform 'NSE Emerge'. The platform offers new and viable options for raising equity capital from diversified set of investors.

The MoU will be in force for a period of five years, during which, DDP and NSE would conduct an extensive awareness drive through seminars, MSME camps, knowledge sessions, road shows & workshops to guide corporates engaged with the Ministry of Defence for fund raising on NSE Emerge platform. NSE will also assist MSMEs in connecting with intermediaries like merchant bankers, registrar, transfer agent, depositories etc and guide them regarding the capital



markets, capital raising mechanism and regulatory compliance and requirement. This MoU will help MSMEs and emerging companies in defence sector to scale-up their business operations, explore new markets and fund their R&D activities.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2038585>



**Press Information Bureau**  
**Government of India**

**Ministry of Defence**

*Mon, 29 July 2024*

## **DAC clears capital acquisition proposals to enhance the capabilities of Indian Army & Indian Coast Guard**

Acceptance of Necessity accorded to procurement of Advanced Land Navigation System for Armoured Fighting Vehicles & 22 Interceptor Boats

A meeting of the Defence Acquisition Council (DAC), under the chairmanship of Raksha Mantri Shri Rajnath Singh, took place on July 29, 2024, in which various capital acquisition proposals were considered. Acceptance of Necessity (AoN) was accorded to the procurement of Advanced Land Navigation System (ALNS) for Armoured Fighting Vehicles (AFVs) of the Indian Army. The system is spoof-proof with high levels of encryption.

The ALNS Mk-II is compatible with Indian Regional Navigation Satellite System, NAVigation using Indian Constellation (IRNSS, NavIC), India in addition to Global Positioning System (GPS) and Global Navigation Satellite System (GLONASS). The ALNS Mk-II offers compatibility with Defence Series Maps resulting in very high accuracy in navigational applications for AFVs. This equipment will be procured from Bharat Electronics Limited (BEL), Chennai under Buy [Indian-Indigenously Designed Developed and Manufactured (IDDM)] category.

In order to enhance the capabilities of the Indian Coast Guard, the DAC accorded AoN for procurement of 22 Interceptor Boats with latest state-of-art system capable of quick interception and shallow water operation in territorial waters. These boats will be used for coastal surveillance & patrolling, search & rescue operations, including medical evacuation.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2038476>

**THE ECONOMIC TIMES**

*Mon, 29 July 2024*

## **Quad foreign ministers announce plan to expand IPMDA to Indian Ocean region**

In a significant move, the four-nation grouping Quad on Monday announced a plan to expand its ambitious IndoPacific Maritime Domain Awareness (IPMDA) programme to the Indian Ocean region that would facilitate monitoring of the strategic waters. The announcement following a Quad

foreign ministerial meeting came amid concerns in New Delhi over China's growing forays into the Indian Ocean which is largely considered as the backyard of the Indian Navy.

The Quad also said that it was working for early operationalisation of its South Asia programme through India's Information Fusion Centre for the Indian Ocean Region.

The meeting was attended by External Affairs Minister S Jaishankar, US Secretary of State Antony Blinken, Japanese Foreign Minister Yoko Kamikawa and Australia's Penny Wong.

In a joint statement, the foreign ministers said the Quad is determined to develop a free and open maritime order consistent with the UN Convention on the Law of the Sea (UNCLOS) in the Indian and the Pacific Oceans and it would enhance collaboration with regional partners for this purpose. "In line with such efforts, we intend to geographically expand the Indo-Pacific Partnership for Maritime Domain Awareness (IPMDA) to the Indian Ocean region," it said.

"We are working for early operationalisation of the South Asia programme through the Information Fusion Centre-Indian Ocean Region (IFC-IOR) in Gurugram, India. Furthermore, we are incorporating effective technical cooperation in close consultation with regional partners," it said. The IPMDA was announced in May 2022 which allowed the partner countries to fully monitor the waters on their shores and help ensure peace and stability in the region.

Under the initiative, data is being supplied to counter illicit maritime activities and respond to climate-related and humanitarian events. The Indian Navy established the IFC-IOR in 2018 to effectively keep track of the shipping traffic as well as other critical developments in the region under a collaborative framework with like-minded countries.

The foreign ministers said the Quad continues to advance the development of a "trusted, secure and robust" telecommunication network and announced a plan to roll out Open Radio Access Networks (Open RAN) in the island nation Palau. In his remarks at a press conference, Jaishankar said the Quad is not a "talk shop" but a platform that generates practical outcomes.

"The Indo-Pacific Maritime Domain Awareness initiative that came out of Quad today links information fusion centres. The Open-RAN network, that we have spoken about so much, is being deployed in Palau," he said. "A space-based climate warning system will be launched soon in Mauritius.

Off-grid solar projects are actually happening in the Indo-Pacific islands," he said. The external affairs minister explained that the overall message was that "our four countries -- all democratic polities, pluralistic societies and market economies -- are working together for a free and open Indo-Pacific, for a rulesbased order and for global good."

"That by itself is a powerful stabilising factor in an uncertain and volatile world," he said. Without directly naming China, the Quad foreign ministers expressed serious concern over the situation in the East and South China Seas and reiterated the Quad's strong opposition to any "unilateral actions that seek to change the status quo by force or coercion."

"All countries have a role in contributing to regional peace, stability, and prosperity while seeking a region in which no country dominates and no country is dominated, competition is managed responsibly, and each country is free from coercion in all its forms and can exercise its agency to determine its own future," the ministers said in the statement.

The Quad also vowed to work towards a free, open and prosperous IndoPacific, a region that has seen increasing Chinese military muscle-flexing in the last few years. "We reaffirm the Quad's steadfast commitment to a free and open Indo-Pacific, which is inclusive and resilient, and are

united in our commitment to upholding the free and open rules-based international order," they said.

<https://economictimes.indiatimes.com/news/defence/quad-foreign-ministers-announce-plan-to-expand-ipmda-to-indian-ocean-region/articleshow/112105577.cms>

# THE ECONOMIC TIMES

Mon, 29 July 2024

## **Indian Navy's new Scorpene submarines to have Made in India 'Heart' by BEL with French architecture: French Naval Group**

Amid ongoing procedure to buy three more Scorpene class submarines for the Indian Navy, Naval Group-- the French partner for the project, said that the heart or the combat management system of these new submarines would be made in India by the Bharat Electronics Limited and supported by architecture from France.

Indian Navy is negotiating a deal with Mazagaon Dockyards which will partner with the French Naval Group to build three more Scorpenes for the Indian Navy after it gets its first six boats by the end of this year.

"Based on the present plan, the heart of the submarine, which is the combat system will be an indigenous one from Bharat Electronics Limited based on French architecture. This will be a very important step towards indigenous content," Naval Group's Executive Vice President Vincent Martinot-Lagarde, told in an email interview.

He said that Mazagaon Dockyards Limited, Naval Group is confident that 60% Indigenous content will be achieved for the overall project - "even if the implementation will be done progressively keeping in mind the delivery targets and quality requirements."

The French official who was in India to meet the Indian Navy brass said "It will be a unique project, which will allow the Navy to have the latest technologies on the modern version of the Scorpene design, with better combat capabilities, unmatched endurance and stealth. We understand MDL is proposing the same in 6 years for the first boat, which is challenging yet fitting of their vast experience."

He said that the Naval Group is providing some part of the supplies that will be indigenized with our industrial partners through subcontracting. "Many critical systems will be indigenised. We will rely on existing partners. We will also extend our ecosystem and discuss potential activities with L&T, Merlin Hawk, Equans Axima India, VEM, Radiant, and more," Lagarde said.

He said the remaining part of the supplies will be under MDL's direct procurement for which the shipyard is discussing with its own suppliers including both Indian and foreigners for subsequent indigenous content.

The Naval Group official said that the major part of this program will flow back to the Indian economy and create several thousands of skilled jobs. "All in all, the aim will also be to ready the industry in India to tackle after sales of these new boats within India in future. This would mean, all of us, MDL, BEL, Naval Group and others will have to prepare the resources for the future during the contract of the building phase," he said.



Lagarde said that it was a good initiative by the Indian Navy to prepare the fleet to be Atmanirbhar and future-ready based on in-house resources and expertise. India is working towards developing a submarine fleet that will have 21 new conventional boats and around six nuclear-powered submarines (SSNs).

To overcome the shortages and delays in the construction of new submarines which are critical for protection from growing Chinese and Pakistani threats, India decided to get three more Scorpene submarines built by the MDL with support from the French naval group in 2023 after a defence acquisition council clearance.

The Defence Ministry is looking at completing the acquisition process within this fiscal year with a minimum of 60 per cent of indigenisation. The high indigenisation content in the submarines is planned for developing India as a hub for submarine building in the region and also preparing a base for exports.

<https://economictimes.indiatimes.com/news/defence/indian-navys-new-scorpene-submarines-to-have-made-in-india-heart-by-bel-with-french-architecture-french-naval-group/articleshow/112103476.cms>



*Mon, 29 July 2024*

## **Indian Navy Warship Flaunts UAV Kill Marks; OSINT Says INS Tabar Most Likely Shot Down Houthi Drones**

The Indian Navy's frontline warship INS Tabar (Battle Axe) is likely to have shot down two Iran-backed Houthi drones as it sailed through the Red Sea to reach Russia. India had opted out of the US-led task force for the Red Sea but had deployed at least a dozen warships in the Gulf of Aden and in the Arabian Sea to provide security cover to the commercial vessels traversing the shipping route.

It was the Indian Navy's largest deployment, which cemented its position as the net security provider. However, the force never publicized this achievement. The achievement came to light during INS Tabar's recent visit to Russia to participate in the Russian Navy Day celebrations. INS Tabar, an Indian Navy's Talwar-class frigate, was seen sporting two drone kill marks. Open-source intelligence showed that the kill marks were not present during the warship's Egypt visit. It is speculated that it has been after it that the warship brought down the drones.

Tabar was commissioned in 2004 and is equipped with a BrahMos supersonic cruise missile, Klub missile system, Barak-1 short-range surface-to-air missile for air defense, and Shtil-1 medium-range surface-to-air missile system. It also has a 76 mm Super Rapid Gun and AK 630 rapid-fire Gatling gun system for close defense against incoming missiles and aircraft. INS Tabar is a Mumbai-based Talwar-class frigate and was born not far from St. Petersburg. The ship was commissioned on April 19, 2004, in the Russian city of Kaliningrad. Tabar is expected to take part in the INDRA-24 exercise, a biennial exercise organized with the Russian Navy.

The Houthis have been attacking merchant ships in this passageway, forcing shipping companies to look for alternate shipping routes. The Red Sea has been vital for the global economy as, according to the United Nations Conference on Trade and Development, 12 percent of global trade passes

through it every year. India neither joined the US-led task force for the Red Sea nor deployed any warships there. However, it had two frontline warships in the Gulf of Aden and at least 10 warships in the northern and western Arabian Seas, along with surveillance aircraft.

Since December 2023, the Indian Navy has deployed 21 ships, over 5,000 personnel, and maritime surveillance aircraft in the region. This deployment is under the aegis of 'Op Sankalp,' which was initiated by the Indian Navy in 2019 as a response to the attacks on commercial shipping in the Gulf of Oman.

Before going to Russia, the warship had been on a maritime deployment to Africa. INS Tabar arrived at the historic port city of Alexandria, Egypt, for a goodwill visit from June 27 to 30, 2024. And it was after that the stealth frigate had the kill markings.

The drones seem to be the Drito class UAVs used by the Houthis, the Yemeni rebel group. The Houthis have fired missiles and flown drones into commercial ships in the Red Sea. Their attacks have targeted more than two dozen vessels since mid-December.

Despite the Red Sea being in India's primary littoral region, India has adopted a different operational approach to the crisis. It has refrained from engaging in kinetic action directed against the Houthis. The reason is the country's multi-faceted engagement with the West Asian powers and its awareness of the sensitivities associated with the Palestinian issue.

The Indian Navy has been among the first navies in the world to assume a leading role in countering piracy in the region since the late 2000s. Incidentally, in 2008, the Indian frigate INS Tabar sunk a pirate mothership, sending a resounding message to the pirates. It had become the first country to engage in kinetic action as part of the wider anti-piracy operations in the region.

While the rebels claim to be targeting either Israeli-owned or operated ships, some of the vessels at the receiving end of their attacks as not connected with Israel at all. Since the beginning of the attack in October 2023, the Houthis have built up a significant drone arsenal.

Saudi Arabia and the US have accused Iran of supplying the Houthis with drones and other weapons. Tehran has denied the charge, and Houthis claim that the drones have been built domestically.

Andreas Krieg, a military analyst and senior lecturer in security studies at King's College London, has said: "The Houthis don't build their own drones, and they don't build their own missiles. None of them are homemade. They are all assembled in Yemen but are entirely based on Iranian infrastructure, Iranian blueprints, and Iranian technology."

Houthi drone arsenal includes the Iranian Shahed-136 drones, which are also used by Russia in the war against Ukraine. They have a range of about 2,000 kilometers. Another combat drone model is the Samad-3. Since January, the US military forces have shot down several Houthi drones in the surrounding waters.

The Houthi drones use GPS guidance and fly autonomously along a pre-fed route. In July, the rebels used a new drone named Yafa against Tel Aviv, which is at least 1,800 kilometers away from Yemen. The Houthi military spokesperson has claimed that the drone could deceive the air defense systems and radar detection and conduct the deepest strike by Yemeni drones so far.

<https://www.eurasiantimes.com/indian-navy-warship-spots-uav-kills-marks/>

## **Ukraine ‘Powers’ Indian Navy’s Blue Water Ambitions; Modi’s Visit To Kyiv To Push Critical Defense Supplies**

In a juggling act, India’s Prime Minister Narendra Modi will likely visit Ukraine at the end of August, a few weeks after Modi’s Russia visit. New Delhi, Kyiv, and Moscow are both sources of critical defense equipment; hence, the need to strike an equilibrium is important. While the world is worried about whether India could broker peace as the protracted war between Russia and Ukraine enters a third year, India also needs to ensure that the supply of spare parts for its predominant Soviet-origin platforms continues unabated.

Gas turbine engines for its warships have been causing delays in the construction of two Talwar-class frigates. The first two frigates’ basic structures were in the Russian shipyard Yantar, where they are currently being constructed. The ships are powered by Ukrainian engines, and the war pushed back the construction timelines. India had to intervene and persuade the Ukrainian government in 2019 to provide two ship engines to the Russian shipyard in Kaliningrad, a semi-exclave in northern Europe, with Belarus and Latvia on its East.

The first ship, Tushil, is ready for acceptance, and the commissioning crew has already arrived in Russia in July. The second ship, Tamal, is expected to be delivered in 2025. These are the last two warships for the Indian Navy to be built in a foreign shipyard. Two of the remaining frigates are being constructed by Goa Shipyard Limited. Following Kyiv’s decision to ban military exports to Russia in 2014, New Delhi had to procure two M90FR gas turbine engines for the two frigates directly from Ukraine. GSL has launched ‘Triput,’ the first of two follow-on Talwar class frigates.

### **Powering Indian Navy’s ‘Blue Water’ Ambitions**

Zorya Mashproekt is a Ukrainian research and production complex specializing in gas turbine construction. It powers 34 frontline warships of the Indian Navy. The Indian Navy currently has 136 Zorya turbines installed on its warships in a configuration of four turbines on each vessel. Zorya turbines are installed on 10 Veer (Tarantul) class missile-carrying corvettes of the Indian Navy. Six Russian-built Talwar-class frigates and four Talwar-class frigates also sport Zorya turbines. Five Rajput class frigates, too, carry Zorya turbines as main propulsion systems. Ships of the formidable Kolkata and Delhi classes are also powered by Zorya turbines.

The majority of the Indian Navy’s propulsion systems are imported. The indigenization effort has not yielded the desired results yet. The Gas Turbine Research Establishment (GTRE) has developed a naval variant of its Kaveri engine, which is now being tested in Vishakhapatnam. This means that in the near future, the Indian Navy will remain dependent on imports for its propulsion needs.

Zorya turbines go to INS Eksila in Visakhapatnam for basic maintenance. However, they need complete overhauling every 30,000 hours and will need to be sent to Ukraine for it. The ongoing war has been detrimental to the security of the Zorya-Mashproekt gas turbine complex. On March 13, 2022, the Russian military attacked the complex in southern Ukraine.

New Delhi tried to remedy the situation as Indian firm Kalyani Strategic Systems (KSSL) acquired a majority stake in the Indian arm of Ukrainian Zorya Mashproekt. The KSSL, wholly owned by Bharat Forge, signed the agreement for the acquisition on May 9, 2023, and the acquisition process

was completed on December 31, 2023. The proposed acquisition is being made to create indigenous capabilities for design, manufacturing, maintenance repair, and overhaul, including spare support for all types of gas turbines.

### **Upgrading An-32 fleet**

The upgrade of Indian Air Force (IAF) Antonov An-32 transport aircraft is behind schedule and is only likely to be completed by 2025 – an eight-year delay from the original plan. The IAF had received 110 An-32s from the erstwhile USSR between 1984 and 1991. In June 2009, India signed a US \$400 million contract with Ukrainian state enterprise Spets Techno Export for technical life extension, overhaul, and upgrade of 105 of these aircraft. Plant 410 of Civil Aviation and Antonov in Kyiv, Ukraine, completed the modernization of the first 40 An-32REs, with the first delivered in 2011 and the last in November 2015.

Till 2019, the Air Force's No. 1 Base Repair Depot in Kanpur has upgraded 15 aircraft in India. However, the upgrade hinges on the supply of modification kits from Ukraine. Also, there is a shortage of certain parts of Russian origin due to strained relations between Russia and Ukraine. In addition to a longer total technical life and new Motor Sich AI-20 engines, the upgrade to the An-32RE includes a new radar, ground proximity warning and collision avoidance systems, satellite navigation, distance measuring equipment, and upgraded radio altimeters. The cockpit features improved crew seats, a new oxygen system, and two multi-functional displays.

The IAF is looking to replace its aging fleet of tactical airlifters; however, the tender has yet to be finalized. These aircraft need to perform their role in the force for at least the next decade. Some of the other critical equipment that gets its spares from Ukraine include 130mm medium guns, spares for T-72 and T-90 tanks, the OSA-AK surface-to-air missile system, and the Tunguska anti-aircraft weapon system.

<https://www.eurasiantimes.com/ukraine-powers-indian-navys-blue/>

## **Science & Technology News**



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*Mon, 29 July 2024*

### **CSIR-Indian Institute of Chemical Technology scientist Dr. S. Sridhar, Inducted as a Fellow of Royal Society of Chemistry, London**

Dr. Sundergopal Sridhar, a Chemical Engineer and Chief Scientist at CSIR Indian Institute of Chemical Technology, Hyderabad, has been admitted as a Fellow of the prestigious Royal Society of Chemistry (FRSC), London, UK with a Member ID: 771115.

During his 26 years as a research scientist, Dr. Sridhar has developed and transferred several technologies for chemical & allied industries, besides contributing immensely to societal welfare.

Major highlights of his career include the commissioning of several membrane pilot plants based on Electrodialysis, Nanofiltration, Gas Permeation, and Reverse osmosis of capacities varying from 500–5000 L/h for solvent recovery, effluent treatment and gas purification in pharmaceutical, steel, textile, aroma chemicals, and petrochemical industries.

Dr. Sridhar has designed and installed more than 75 water purification plants based on Nanofiltration, Ultrafiltration, and Reverse osmosis of 600-4000 L/h capacity for purification of ground water, surface water, and flood water for 5 Million population affected by fluorosis, typhoid, and other water-borne diseases in 10 States of India. Other innovations include a novel and affordable system for medical-grade ultrapure water for dialysis of more than 2 lakh patients suffering from chronic kidney disease in govt. and private hospitals. He has designed an Atmospheric Water Generator of 60 to 1000 Lit/day capacities to produce remineralized drinking water from relative humidity in the air in water-scarce regions, hospitals, and railway stations.

To mitigate COVID-19, Dr. Sridhar designed low-cost novel multilayer washable masks that were provided to more than 6 lakh people, including school children and frontline workers. These masks generated Rs 2 Cr revenue for NGOs and employed 500 senior citizens and Women's Self-Help Groups.

Dr. Sridhar has published 181 research papers in reputed international journals with an h-index of 53. He is ranked among the Top 2% of Scientists worldwide by Stanford University, USA, and Elsevier Science Publishers in 2021, 2022 & 2023. He has 15 patents, 4 Books, and 50 Book Chapters to his credit.

Dr. Sridhar is a recipient of 70 Prestigious Science Awards, including CSIR Young Scientist Award 2007, Scopus Young Scientist Award 2011, NASI Reliance Industries Platinum Jubilee Award 2013, VNMM award from IIT-Roorkee 2015, five CIPET national awards from 2016-20, Nina Saxena Excellence in Technology Award from IIT-Kharagpur in 2017, three HPCL NGIC Awards for 2019-21, seven IChE awards, and ASSOCHAM Award 2023.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2038322>



*Mon, 29 July 2024*

## **CMFRI cracks captive breeding code for giant trevally**

In a major breakthrough, the ICAR-Central Marine Fisheries Research Institute has achieved a landmark success in induced breeding and seed production of the giant trevally, a highly prized marine species.

The giant trevally is a fast-growing, important food fish that can be farmed in marine and estuarine cages, pens and coastal ponds. This fish can grow faster than pompanos and can tolerate wider salinity ranges and water quality conditions.

"The achievement is a breakthrough in mariculture and is a significant advancement in the efforts to sustainably manage and conserve giant trevally as a new candidate species in the mariculture sector," said Dr A Gopalakrishnan, Director of CMFRI.

This technology was developed by scientists at the Regional Centre of ICAR-CMFRI in Vizhinjam, Thiruvananthapuram with the funding support of the Department of Biotechnology, Union Ministry of Science and Technology, an official release said here on Monday. Extensive research and trials



were required to overcome challenges due to specific breeding requirements and the complex reproductive biology of the fish.

This involved meticulous monitoring of its behaviour, hormone administration and precise environmental control, it said. Research was carried out under the leadership of scientists Ambarish P Gop, Dr M Sakthivel, and Dr B Santhosh.

A highly valued game fish commercially valued for its firm and excellent flesh quality preferred across the Indo-Pacific region, giant trevally is a much sought-after popular marine fish and its price ranges from ₹400 to 700/ kg, the release said.

Belonging to the Carangidae family, this fish is well known for its large size and has immense potential in the mariculture sector, typically found in coastal reefs, lagoons and open seas. CMFRI's initial cage farming trials with pellet feed indicated that this fish reaches marketable size up to 500g in 5 months and around 1kg in 8-month culture, it said.

On CMFRI's immediate focus, Gopalakrishnan said the institute would optimise the breeding protocols to scale up production efficiently and refine larval rearing protocols of this species. "The initial success of the giant trevally's captive seed production is expected to pave the way for large-scale fish seed production and farming of this marine fish. Giant trevally is a fast-growing, hardy species that can be easily farmed using pellet diets throughout the culture period," Gopalakrishnan said.

<https://www.hindustantimes.com/science/cmfri-cracks-captive-breeding-code-for-giant-trevally-101722248094689.html>

