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# समाचार पत्रों से चयित अंश Newspapers Clippings

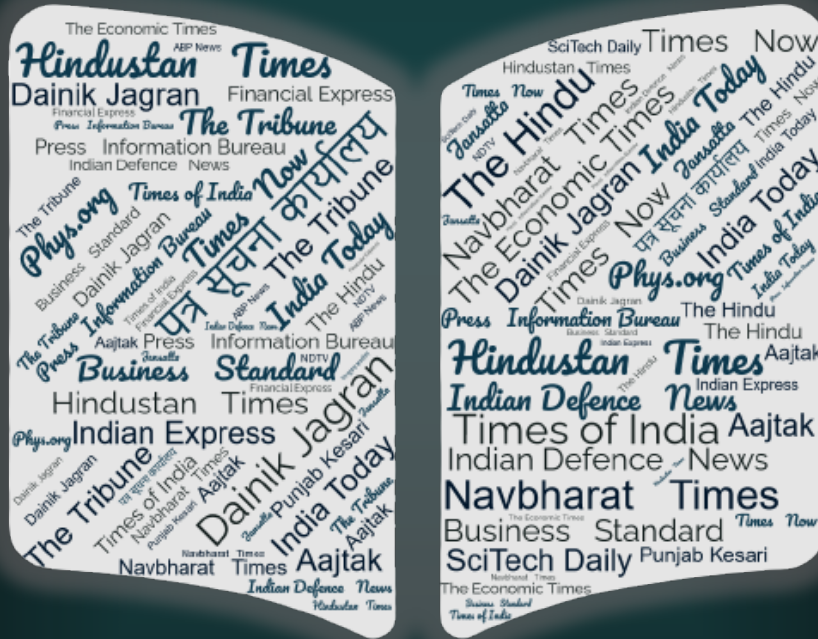
A Daily service to keep DRDO Fraternity abreast with DRDO  
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*Wed, 07 Dec 2022*

### **DFRL Told to Redefine, Partner with Industry Innovation**

A three-day national conference on “Futuristic strategies for sustainment of troops in different terrains” organised by the Mysuru-based Defence Food Research Laboratory (DFRL), a DRDO lab, got off to a start in Mysuru on Wednesday. The conference gave researchers, service users, industry partners, and academics a common platform to debate the nuances of the challenges at hand and develop concepts for solutions. During the conference, the past experiences will be shared, difficulties discussed and potential future course of action will be imagined. Inaugurating the conference, DRDO Director General (Life Sciences) U.K. Singh told the DFRL to redefine its roles and collaborate with the industry in R and D as it is important to become atmanirbhar in all our productions. Nearly 25 per cent of the funding for R and D is now given to the industry other than the labs with the focus on bringing in innovation.

While complimenting the DFRL for its roles during natural disasters, he said the DFRL sent food supplies to the affected persons during disasters like Kerala floods and Nepal earthquake. With regard to technology transfer, an apricot processing plant has come up in Leh, Ladakh with the help of DFRL. The industry partners must be seen as the competitors and work towards bringing innovation, he added. “I think the DFRL can think beyond and come up with innovative foods that help reduce stress, developing foods with special ingredients. The world is working way ahead of us. The academia and the industry must become close partners to bring about the change. It’s time to think of even developing technology for artificial photosynthesis,” he felt.

In his address, R. Umamaheshwaran, Director, HSFC, ISRO, Bengaluru spoke about the contributions of the DFRL and the food technologies it developed for the Army, Navy and the Air Force, for different terrains and conditions. “It’s time the labs innovate and go along with the situations for developing foods, like how it developed foods for the astronauts.” Cmde Manoj Sharma, Principal Director, C and V, Naval HQ also spoke on the occasion. DFRL Director Anil Dutt Semwal spoke about the DFRL’s contributions since its inception and the way forward. Scientists V.A. Sanjay Kumar and R. Kumar were present.

On the occasion, new technologies developed by the DFRL were released by the dignitaries, and the MoU documents were handed over to the industry partners to whom the technology transfer has been done. The technologies developed include biodegradable cutlery, milk testing kit (Mark II), multilayer degradable food packaging materials and biodegradable films for packaging applications. The conference will look into military dietary needs and focused nutritional delivery besides development of sustainable food packaging. hybrid technology for food

processing, modern methods and strategies for evaluating the safety and quality of food; designing food processing and packaging systems with artificial intelligence assistance; utilising 3-D printing technology to create culinary products are among the thrust areas of the conference. Food sustainability – current challenges and potential while preserving the food supply chain and R and D for optimising and enhancing military performance will also be discussed at the conference.

DFRL said it has engaged in research and development project to build a technology platform by utilising cutting-edge processing technologies such as microwave sterilisation, infrared processing, high pressure processing, pulsed electric field processing etc to develop newer products/processes to extend shelf life of products to meet military nutritional requirements and enhance soldier acceptance for food products.

<https://www.thehindu.com/news/national/karnataka/dfrl-told-to-redefine-partner-with-industry-innovation/article66235679.ece>



बुधवार, 07 दिसंबर 2022

## TAPAS-BH-201 की तपिश से जल जाएंगे दुश्मन, जानिए भारत के स्वदेशी ड्रोन की खूबियां

बेंगलुरु स्थित एयरोनॉटिकल डेवलपमेंट इस्टैबलिशमेंट (ADE) द्वारा डिजाइन और विकसित किया गया तपस यूएवी ने 18 घंटे का उड़ान परीक्षण सफलतापूर्वक पूरा कर लिया है. ADE डीआरडीओ के तहत एक प्रमुख रिसर्च लेबोरेटरी है. डीआरडीओ ने एक बयान में बताया कि इस परीक्षण को बुधवार को कर्नाटक के चित्रदुर्ग स्थित एयरोनॉटिकल टेस्ट रेंज में सफलतापूर्वक अंजाम दिया गया. TAPAS अनमैन्ड एरियल व्हीकल (UAV) मानव रहित विमान है. एयरक्राफ्ट आगामी बिना पायलट के चलने वाली विमानों के डेवलपमेंट की दिशा में एक मील का पत्थर है. यह आत्मनिर्भरता की दिशा में एक जरूरी कदम है.

### क्या है TAPAS की खूबियां?

भारत अपनी सैन्य ताकत को मजबूत करने के लिए ड्रोन, मिसाइल समेत अत्याधुनिक प्रणाली को विकसित कर रहा है. इसी कड़ी में TAPAS का नाम भी शामिल है. TAPAS एक अत्याधुनिक मानव रहित विमान है. इसे भारत के एयरोनॉटिकल डेवलपमेंट इस्टैबलिशमेंट (एडीई) ने अमेरिका के जनरल एटॉमिक्स एमक्यू-1 प्रीडेटर ड्रोन की तर्ज पर विकसित किया है. TAPAS-BH-201 ने साल 2016 को कर्नाटक के चित्रदुर्ग जिले में बेंगलुरु से 200 किमी दूर चल्लकेरे में पहली सफल उड़ान भरी थी.

## 35 हजार फीट की ऊंचाई पर 24 घंटे टिक सकता है

तपस बीएच 201 ड्रोन 350 किलोग्राम के पेलोड के साथ उड़ान भर सकता है. तपस बीएच 201 9.5 मीटर लंबा और 20.6 मीटर चौड़ा है. इसका वजन 1800 किलोग्राम है. तपस ड्रोन में डीआरडीओ के व्हीकल रिसर्च एंड डेवलपमेंट इस्टेब्लिशमेंट (VRDE) के बनाए स्वदेशी इंजन का इस्तेमाल किया जा रहा है. इनमें से प्रत्येक इंजन 130 किलोवॉट या 180 हॉर्सपावर की ताकत दे सकता है. यह ड्रोन 1000 किलोमीटर की रेंज में निगरानी और हमला कर सकता है. तपस 224 किमी प्रति घंटे की स्पीड से उड़ सकता है. तपस 35 हजार फीट की ऊंचाई पर 24 घंटे टिका भी रह सकता है. तपस की रेंज करीब 1 हजार किलोमीटर है. तपस विदेशों से खरीदे गए ड्रोन से लगभग आठ गुना सस्ता भी है. भारतीय ड्रोन तपस-बीएच-201 तुर्की के TB2 ड्रोन से ना सिर्फ लंबाई में बड़ा है, बल्कि स्पीड में भी तेज है.

<https://www.gnttv.com/india/story/tapas-uav-drdo-armed-tapas-bh-201-achieved-milestone-flight-test-18-hours-aeronautical-test-range-480279-2022-12-07>

## DRDO on Twitter



 DRDO   
@DRDO\_India

#DRDOUpdates | DFRL, Mysuru is organising national conference on “Futuristic Strategies for Sustainment of Troops in Different Terrains” from 7-9 Dec. It will bring researchers, tri-services, industry & academia together to discuss on issues & solution  
[@SpokespersonMoD](#)



 रक्षा मंत्री कार्यालय/ RMO India

10:42 pm · 7 Dec 2022





**Press Information Bureau  
Government of India**

**Ministry of Defence**

*Wed, 07 Dec 2022*

### **Vice Chief of Army Staff Proceeds on a Visit to Malaysia**

Lieutenant General BS Raju, the Vice Chief of Army Staff (VCOAS) has proceeded on a three day visit to Malaysia from 08 to 10 December 2022. During the visit, the Vice Chief will take forward the excellent defence cooperation between India and Malaysia through multiple meetings with senior military and civilian leadership of the country. he VCOAS is scheduled to call on the Deputy Chief of Malaysian Army and Chief of Staff of Malaysian Armed Forces, where he will exchange ideas on issues of mutual interest.

He will also engage in extensive discussions with CEO Malaysian Institute of Defence & Strategic Studies. On 09 November 2022, the VCOAS will witness various training activities of the ongoing joint 'Exercise HARIMAU SHAKTI' and interact with the troops. The visit of the VCOAS will further deepen the bilateral relationships between the two Armies and act as a catalyst for closer coordination and cooperation between the two countries on a host of strategic issues.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1881297>

## **THE TIMES OF INDIA**

*Thu, 08 Dec 2022*

### **Army-DRDO Tussle Ends, Government to Start Desi Light Tank Acquisition**

India is set to kick-start a mega indigenous acquisition project for 354 light tanks, the critical operational necessity for which has come to the fore during the ongoing over 30-month long confrontation with China in eastern Ladakh. Sources say the defence ministry has resolved the festering differences between the Army and DRDO over the light tanks meant for high-altitude

warfare in Ladakh and Arunachal Pradesh as well as riverine areas like the Rann of Kutch and can be swiftly deployed after being transported by air. Defence minister Rajnath Singh-led defence acquisitions council will soon take up the grant of AoN (acceptance of necessity) for the armoured fighting vehicle-Indian light tank (AFV-ILT) under 'Project Zorawar', at a cost of around Rs 17,500 crore, the sources told TOI.

The proposal is that 59 of the 354 light tanks, each weighing less than 25 tonnes with a high power-to-weight ratio as well as superior firepower and protection, will be reserved for the tanks developed by the Defence Research and Development Organization (DRDO). The remaining 295 tanks will be manufactured under the government-funded design and development project for the Indian industry in the 'Make-1' category of the defence acquisition procedure (DAP). "DRDO can also compete with private players for this," a source said.

The Army had strongly pitched for all 354 tanks to be produced by the private sector under the Make-1 category. But the DRDO argued its Combat Vehicles Research and Development Establishment was already working to develop a light tank prototype with private sector giant Larsen & Toubro as the "lead system integrator". "DRDO says its first light tank prototype will roll out by mid-2023. So, the decision is that 59 tanks be reserved for DRDO, with the condition that it delivers a successful prototype ahead of the others in the fray," the source added. The 12-lakh strong Army had managed to deploy some of its heavier Russian-origin T-90S and T-72 main-battle tanks (40 to 50 tonne each) in eastern Ladakh after the confrontation erupted in 2020.

<https://timesofindia.indiatimes.com/india/army-drdo-tussle-ends-gopovernment-to-start-desi-light-tank-acquisition/articleshow/96068248.cms>



*Wed, 07 Dec 2022*

## **Navy Budget is Optimized for Several Ongoing Naval Projects**

In driving self-reliance and technology development, the Indian Navy is well established on a path of budget optimization. The modernization of the Armed Forces depends on the defence budget. Services plan their acquisition based on the budgetary allocation. In the last defence budget, the navy received the increased outlay which was necessary to drive key naval projects. Recently, the Navy Chief said: "The Navy's share of the Defence Budget this year was 17.8 %, and in using this judiciously, we have achieved a Revenue to Capital expenditure ratio of 32% – 68% – which accords us flexibility in pursuing our capability developments plan."

### **What are the key modernization projects for the Indian Navy? What are the ongoing projects?**

According to the Indian Navy's current Maritime Capability Perspectives, the present force level comprises about 150 ships and submarines. The Indian Navy's perspective-planning in terms of 'force-levels' is now driven by a conceptual shift from 'numbers' of platforms – that is, from the old 'bean-counting' philosophy—to one that concentrates upon 'capabilities'.

## Ongoing Projects

There are presently more than 50 ships and submarines under construction. Our preferred choice of inducting ships has been through the indigenous route. For instance, the GRSE has already delivered all three of the large amphibious ships and ten water-jet Fast Attack Craft. The yard is presently constructing advanced Anti-submarine Corvettes and has been recently awarded a contract to build LCUs. One of the biggest projects is the submarines of the Scorpene Class which is constructed at Mazagon Dock Shipbuilders (MDL). The project—75 is near completion at MDL, Mumbai. Indian Navy's sixth and final scorpene submarine named 'Vagsheer' has already been launched by the MDL in Mumbai.

The construction of Kolkata Class and P-15B destroyers besides stealth frigate of the Shivalik Class come under the capability plan for acquiring advanced -level technological upgrades. The Project 15B class of ships will be equipped with next-generation stealth guided-missile destroyers. Two Talwar-class frigates are being built in Russia for the Indian Navy. The construction of Indian naval ships continues in Russia which belongs to the new generation of frigates. The number of Offshore Patrol Vessels for the Navy and the Coast Guard, has advanced versions of this type is under construction at Goa Shipyard Limited. Indian Navy is also working on the Mid-Life Upgrades (MLUs) of warships. After their MLU, ships of the Rajput Class as also those of the Brahmaputra Class will emerge as potent 21st Century combatants with significant residual life. As Indian Navy has been operating indigenously built warships from four different classes—Shivalik class, Talwar class, Brahmaputra class and Godavari class.

<https://www.financialexpress.com/defence/navy-budget-is-optimized-for-several-ongoing-naval-projects/2904287/lite/?>

# The Tribune

*Thu, 08 Dec 2022*

## Sailing the Rough Seas

*By C Uday Bhaskar*

Navy Day is celebrated on December 4 to commemorate Operation Trident — the missile boat attack on Karachi harbour in the 1971 War for the liberation of Bangladesh — and this year, the annual event was distinctive, for it was held outside of Delhi. This is a departure from earlier practice for the Indian military, wherein individual service days are celebrated in the national capital with the President, Vice-President and Prime Minister gracing the occasion. President Droupadi Murmu was received in Visakhapatnam, HQ of the Eastern Naval Command, on December 4 with customary pomp and tradition.

Given the ceremonial nature of the occasion, it was appropriate that the President dwelt on India being 'inherently a maritime nation' and added that the oceans and seas lapping the peninsula would play a vital role in India's growth and prosperity in the years ahead. She also expressed her confidence that the Navy would grow from strength to strength, even as it pursued the vision of 'Atmanirbhar Bharat'. However, for India to realise its untapped maritime potential and enhance its naval capability, the many challenges that lie ahead need to be objectively identified.



Some of these strands were reflected in the media interaction of the Naval Chief, Admiral R Hari Kumar, as also in certain regional developments related to the Indian Ocean.

Two significant observations of Admiral Kumar frame the nature of the challenge for the Navy in the near future. Lauding the commissioning of the nation's first indigenously designed and built aircraft carrier, IAC 1, INS Vikrant, in Kochi shipyard, the Naval Chief disclosed that the next carrier would, in all probability, be a 'copy' of this 40,000-tonne vessel and not the larger 65,000-tonne IAC 2 that had been earlier envisaged. Whether this reduction in the size of the next carrier has been impelled by fiscal considerations or reasons more professional is moot but the extrapolation is evident. The Navy will have to make its plans around relatively smaller platforms (40,000 tonnes) and this would have a bearing on the quality and quantum of air power that India can bring to bear in the Indian Ocean in the first instance and other maritime domains — depending on the exigency that may arise, which will warrant such a demonstration of trans-border military power by India.

The encouraging news that Admiral Kumar shared was that the Navy's share of the Defence Budget moved up to 17.8 per cent this year, and furthermore, the revenue to capital expenditure ratio was at a healthy 32:68, which, he added, 'accords us flexibility in pursuing our capability development plans'. To remain credible, navies need sustained platform induction and in the absence of a holistic acquisition package in the appropriate temporal cycle, optimum combat efficiency is impaired. This gap is discernible in relation to INS Vikrant and will also affect the second carrier as and when it is commissioned. The credibility of an aircraft carrier is determined by its fighter aircraft and in the case of Vikrant, the current MiG-29K is not the most viable choice. This Russian-origin aircraft was not designed for deck landing and is more of an interim measure, even as the Navy is examining other options. Admiral Kumar indicated that the marine version of the French Rafale and the US F/A-18 Boeing have been evaluated and that a decision would be taken in the matter. Given the long lead time associated with Indian military acquisition decisions, it is likely that INS Vikrant will be operating below optimum combat levels pending induction of the Rafale or the F/A-18.

Reiterating the Navy's commitment to atmanirbharta or indigenisation, the Naval Chief also added that the first prototype of the indigenous Twin-Engine Deck-Based Fighter would be ready by 2026 and induction expected by 2032 — a decade from now. Given the current status of the Indian fighter aircraft programme, this is an ambitious timeline and few nations have been able to produce a truly indigenous fighter in less than 15 years. Conceding that there have been delays in the indigenous submarine building programme (project 75I), Admiral Kumar made reference to the 'complex acquisition process' and the challenges of satisfactorily implementing the newly formulated strategic partnership model, which seeks to encourage and nurture for the long term Indian private industry participation in major military programmes.

In summary, this candid review of the Navy's current acquisition plans when added to the legacy gaps (such as minesweepers) would point to a less-than-adequate force level. This is unfolding against the backdrop of the Chinese navy forging ahead and overtaking the US navy to become the world's largest navy. China's plans to enhance its footprint in the Indian Ocean was on display in a mid-November event, wherein it hosted a 19-nation China-Indian Ocean Region (IOR) Forum at Kunming in the south-western Yunnan province. Predictably, India was not invited. The level of participation remained opaque and nations like Australia and the Maldives later clarified that there was no official representation and those nationals of their countries who attended the forum did so in their personal capacity. Be that as it may, China's resolve to

enhance its footprint in the IOR remains robust and India will have to evolve responses that will be effective and sustainable in the long term. The gaps in the naval quiver need to be redressed in a calibrated manner, such that they harmonise with India's composite trans-border military capability that would be relevant for a nation that will soon become the world's third largest economy.

<https://www.tribuneindia.com/news/comment/sailing-the-rough-seas-458703>



*Wed, 07 Dec 2022*

## **IAF Boosts Su-30 Aircrafts' Capabilities with New Over 250km Strike Range Missile**

In a significant boost for the capabilities of its Su-30 combat aircraft fleet, the Indian Air Force is equipping them with a new missile which can take down ground-based targets from a distance of over 250 kilometres. The new missile has been acquired by the Indian Air Force under emergency provisions and will further enhance the capabilities of the Su-30 fighter jets which are now the mainstay of the force for at least the next 20 years. "The new high-speed low drag missile can hit targets at over 250 kilometres and is going to boost the capability of the aircraft," defence sources told ANI. The capability would allow the Indian Air Force to strike down enemy military camps and terrorist infrastructure as it did during the Balakot operations in 2019 from well within its own territory.

"The new missile would be important for the Su-30 fleet of the IAF as integrating long-range missiles from European or American origin would not be easy in view of the global situation," the sources said. The IAF is also upgrading the Su-30s in an upgrade programme expected to cost over Rs30,000 and would begin with 85 planes. The IAF currently has around 260 of these heavy air superiority fighter jets which are now flying in sync with the most modern Rafale fighter planes of the force. The IAF has strengthened the capabilities of the Su-30s in a big way with the addition of the BrahMos supersonic cruise missiles which can hit targets at over 500 kilometres. The air-to-air missiles have also seen an upgrade while the made-in-India Astra - all weather beyond-visual-range air-to-air, and Rudram anti-radiation next-generation missiles have been added to the fleet. The BrahMos capability can help the Air Force to tackle any long-range tracking radar like that of the S-400 air defence systems.

[https://www.businessinsider.in/defense/news/iaf-boosts-su-30-aircrafts-capabilities-with-new-over-250km-strike-range-missile/amp\\_articleshow/](https://www.businessinsider.in/defense/news/iaf-boosts-su-30-aircrafts-capabilities-with-new-over-250km-strike-range-missile/amp_articleshow/)

## **Marine Rafale Scores over American Super Hornet in Navy-Deal Dogfight**

The maritime version of French fighter Rafale has emerged as the frontrunner over the American F/A-18 Super Hornet for the mega multi-billion contract to supply 26 jets for Indian aircraft carriers. The Navy has now submitted a detailed report on these two fighters, which were trial-evaluated earlier this year, to the defence ministry to take a final decision on what will eventually be a government-to-government deal, defence sources told TOI on Wednesday. As per the report, Dassault Aviation's Rafale-M has been found to be "more suitable in meeting the operational requirements and criteria" of the Navy compared to the Boeing-manufactured F/A-18, the sources added.

Both the fighters underwent operational demonstration trials to assess their "suitability and capability" at the shore-based test facility (SBTF) at INS Hansa in Goa, which has a ski-jump to resemble an aircraft carrier's deck, earlier this year, as was then reported by TOI. The French fighter, in any case, had a head start on logistical and other grounds given that the IAF has already inducted 36 Rafales under the Rs 59,000 crore deal inked with France in September 2016. With the Modi government dismissing all allegations of corruption in the deal, IAF now has a Rafale squadron each deployed at Ambala and Hasimara.

Similarly, Rafales will figure prominently in the IAF's long-standing quest to acquire additional 4.5-generation fighters with "some fifth-generation capabilities". These numbers could vary from 57 to 114 fighters, with the bulk of them to be produced in India. The IAF is down to just 30-31 fighter squadrons when at least 42 are needed for the threat posed by China and Pakistan. The Navy, on its part, has been fast-tracking its case for the 26 carrier-based fighters especially after commissioning of the country's first indigenous aircraft carrier, the 45,000-tonne INS Vikrant, on September 2.

Navy chief Admiral R Hari Kumar had last week said that the 26 fighters were an "interim solution" till the indigenous twin-engine deck-based fighter (TEDBF) being developed by the DRDO was ready. It will take the TEDBF at least a decade to become fully operational. As of now, the Navy is left with 40 of the 45 MiG-29Ks inducted from Russia at a cost of \$2 billion from 2009-10 onwards to operate from the deck of the 44,500-tonne aircraft carrier INS Vikramaditya, which cost another \$2.3 billion. The operational serviceability of the MiG-29K fighters has been a major problem for some years.

INS Vikrant will become fully combat-ready after the MiG-29Ks complete crucial flight trials from her sprawling deck, and she is equipped with all her high-tech weapons like the Israeli-origin 80-km range Barak-8 surface-to-air missile systems, by around mid-2023, as reported by TOI earlier. The Navy, on its part, has been fast-tracking its case for the 26 carrier-based fighters especially after commissioning of the country's first indigenous aircraft carrier, the 45,000-tonne INS Vikrant, on Sept 2.

<https://timesofindia.indiatimes.com/india/marine-rafale-scores-over-american-super-hornet-in-navy-deal-dogfight/articleshow/96066201.cms>

## **अग्नि-5 टेस्ट से ठीक पहले फिर आया चीनी खुफिया जहाज:750 किमी दूर की बातचीत सुन सकता है वांग-5, क्या रोकनी पड़ेगी टेस्टिंग**

भारत की टोह लेने इस साल तीसरी बार चीन ने अपने खुफिया जहाज को भेजा है। 15-16 दिसंबर को भारत अग्नि-5 मिसाइल का टेस्ट करने जा रहा है। इसके लिए 30 नवंबर को NOTAM यानी नोटिस टू एयरमेन जारी किया था। इसके मुताबिक बंगाल की खाड़ी के 5,400 किमी. की रेंज को नो फ्लाई जोन बनाया गया है। NOTAM जारी होने के सिर्फ 5 दिन बाद ही चीन ने अपना जासूसी जहाज युआन वांग-5 हिंद महासागर के क्षेत्र में भेज दिया। चीन का ये जहाज सोमवार से इंडोनेशिया के जावा द्वीप के आस-पास चक्कर लगा रहा है। इससे पहले अगस्त और नवंबर में भी चीन के खुफिया जहाज आ चुके हैं। भास्कर एक्सप्लेनर में डिफेंस एक्सपर्ट्स से जानेंगे कि चीन बार-बार अपने खुफिया जहाज क्यों भेज रहा है, इसके क्या खतरे हैं और भारत क्या एक्शन लेगा?

### **अग्नि-5 की जद में पूरा चीन, ट्रेस कर रहा रडार और प्रोजेक्ट्री**

डिफेंस एक्सपर्ट रिटायर्ड लेफ्टिनेंट कर्नल जेएस सोढ़ी का कहना है कि भारत अपनी डिफेंस क्षमता लगातार बढ़ा है, ये चीन को रास नहीं आ रहा। अग्नि-5 मिसाइल की जद में पूरा चीन आएगा, जो चीन आर्मी के अधिकारियों के बीच इस वक्त हॉट टॉपिक होगा। ऐसे में चीन की कोशिश है कि वो इस मिसाइल से जुड़ी अधिक से अधिक खुफिया जानकारी जुटा सके। डिफेंस एक्सपर्ट रिटायर्ड मेजर जनरल पीके सहगल के मुताबिक, 'चीन, भारत के लगातार मिसाइल टेस्टिंग से परेशान है। अग्नि-5 के सफल परीक्षण के बाद भारत एयर, लैंड और वाटर तीनों ही जगहों से चीन को निशाना बना सकेगा। इससे चीन परेशान है।

### **चीनी शिप का भारत की मिसाइल टेस्टिंग पर कोई असर नहीं**

जेएस सोढ़ी के मुताबिक, 'भारत ने पहले ही खुले तौर पर अनाउंस कर रखा है कि वो अगले हफ्ते अग्नि-5 मिसाइल का टेस्ट करेगा। ऐसे में चीन अपनी पूरी सेना भी लाकर खड़ा कर दे, तो भी भारत को इस मिसाइल परीक्षण से रोक नहीं सकता। चीन सिर्फ भारत पर दबाव बनाना चाहता है, ये एक बेहद आम कूटनीति है। इस बीच वो चाहेगा कि किसी तरह मिसाइल की खुफिया जानकारी पता लगाए, ताकि इसका काउंटर तैयार किया जा सके।' पीके सहगल का कहना है कि चीन इस बार हमारे डिफेंस सिस्टम का तोड़ निकालने की कोशिश करेगा। उसकी मंशा मिसाइल परीक्षण को प्रभावित करने की नहीं, बल्कि मिसाइल की खुफिया जानकारी निकालने की है। भारत भी इस बात से वाकिफ है, लेकिन वो अपना परीक्षण सिर्फ इस डर से नहीं रोकेगा कि कोई चीनी जहाज उसके मिसाइल की जासूसी करने के लिए खड़ा हुआ है।

## भारत ने पिछली बार ब्लॉक कर दिया था चीनी शिप का ट्रेसिंग सिस्टम

जेएस सोदी ने कहा, 'इंटरनेशनल वाटर क्षेत्र में किसी भी देश का समुद्री जहाज आ-जा सकता है, इस पर कोई रोक-टोक नहीं होती। भारत के खुफिया एजेंसी की इस वक्त चीन के स्पाई जहाज के हर मूवमेंट पर नजर होगी। पीके सहगल के मुताबिक, चीन इससे पहले भी भारतीय जहाजों और उसके मिसाइल की खुफिया जानकारी लेने अपने जासूसी जहाज भेज चुका है। पिछली बार जब उसका जासूसी जहाज श्रीलंका के हंबनटोटा में हमारी मिसाइल की टोह लेने आया था तो सेना ने गल्फ इलेक्ट्रॉनिक सिग्नल से उसके ट्रेसिंग सिस्टम को ब्लॉक कर दिया था। इस बार भी भारत कुछ ऐसा कदम उठा सकता है।

पिछले आठ साल में ये छठी बार है जब भारत की जासूसी करने के लिए चीन ने अपने जहाज भेजे हैं!

## 8 साल में छठी बार शिप से भारत की जासूसी की कोशिश

- **2014 :** चीनी पनडुब्बी चांगझोंग-2 कोलंबो के पास हंबनटोटा पोर्ट के पास आ गई थी। भारत सरकार ने इस पर आपत्ति जताई थी।



- **2019 :** भारतीय नेवी ने अंडमान द्वीप समूह के करीब आने पर चीनी नेवल शिप थी यान-1 को चेतावनी दी थी।

- **2020 :** जनवरी में 4 से 6 चीनी रिसर्च शिप हिंद महासागर क्षेत्र में देखे गए थे।

- **2022 :** 16 से 22 अगस्त तक में चीन का जासूसी शिप युआन वांग-5 श्रीलंका के हंबनटोटा पोर्ट पर रुका था। तब भारत ने श्रीलंका के सामने विरोध दर्ज कराया था।

- **2022 :** नवंबर में जब भारत बंगाल की खाड़ी में मिसाइल टेस्ट कर रहा था, ऐसे वक्त पर हिंद महासागर में चीन का जासूसी शिप युआन वांग-6 देखा गया था।

- **2022 :** दिसंबर में अग्नि V के परीक्षण के सप्ताह भर पहले युआन वांग-5 ने हिंद महासागर के क्षेत्र में प्रवेश किया।

## ओडिशा के अब्दुल कलाम द्वीप से होगा परीक्षण

चीन का जासूसी जहाज युआन वांग-5 इस समय इंडोनेशिया के जावा द्वीप के आस-पास है। भारत अग्नि-5 का परीक्षण ओडिशा के अब्दुल कलाम द्वीप से करेगा। इन दोनों के बीच की दूरी करीब 4000 किमी है। यानी चीन का ये शिप फिलहाल अभी इतनी दूरी पर है कि वो मिसाइल परीक्षण से जुड़ी कोई जानकारी हासिल नहीं कर सकता। परीक्षण को अभी लगभग 8 दिन बाकी हैं और चीन का ये जहाज इंटरनेशनल वाटर में 19 किमी की रफ्तार से ट्रेवल कर रहा है। भारत के NOTAM के अनुसार बंगाल की खाड़ी के 5400



किमी एरिया को नो फ्लाइंग जोन घोषित किया गया है। ऐसे में चीन की कोशिश ये होगी कि परीक्षण के पहले वो शिप को इतनी दूरी पर प्लेस कर दे, जहां से आसानी से मिसाइल के प्रोजेक्टाइल को ट्रैक कर सके।

## अग्नि V मिसाइल की खासियत



अग्नि V मिसाइल सरफेस टू सरफेस मार करने वाली भारत की पहली और एकमात्र इंटर कॉन्टिनेंटल बैलिस्टिक मिसाइल है।

ये 5000 हजार किमी से ज्यादा दूरी तक मार सकती है। इसकी रेंज में पूरा चीन आएगा। चीन के अलावा मिसाइल की जद में यूरोप और अफ्रीका के कुछ हिस्से भी आएंगे।

ये मल्टिपल इंडिपेंडेंटली टारगेटबल व्हीकल (MIRV) से लैस है यानी एक साथ मल्टीपल टारगेट के लिए लॉन्च की जा सकती है।

ये मिसाइल डेढ़ टन तक न्यूक्लियर हथियार अपने साथ ले जा सकती है। इसकी स्पीड मैक 24 है, मतलब आवाज की स्पीड से 24 गुना ज्यादा।

अग्नि-5 के लॉन्चिंग सिस्टम में कैनिस्टर तकनीक का इस्तेमाल किया गया है। इस वजह से इस मिसाइल को कहीं भी आसानी से ट्रांसपोर्ट किया जा सकता है।

इस समय भारत के अलावा दुनिया के सिर्फ आठ देशों के पास इंटर कॉन्टिनेंटल बैलिस्टिक मिसाइल (ICBM) हैं। इनमें रूस, अमेरिका, चीन, फ्रांस, इजराइल, ब्रिटेन, चीन और उत्तर कोरिया शामिल हैं।

### अग्नि 5 के परीक्षण पर शांति का राग अलाप चुका है चीन

पिछले साल सितंबर में अग्नि 5 के परीक्षण के बारे में चीनी विदेश मंत्रालय के प्रवक्ता झाओ लिजान ने कहा था कि सभी देशों को दक्षिण एशिया में शांति और सुरक्षा बनाए रखने के लिए साझा प्रयास करना चाहिए। लिजान ने कहा था- भारत न्यूक्लियर हथियार ले जाने में सक्षम बैलिस्टिक मिसाइलों का विकास नहीं कर सकता है। ये संयुक्त राष्ट्र सुरक्षा परिषद (UNSC) के प्रस्ताव 1172 का उल्लंघन है। दरअसल, जून 1998 में किए गए परमाणु परीक्षण के बाद सुरक्षा परिषद का प्रस्ताव 1172 लागू किया गया था। प्रस्ताव में भारत और पाकिस्तान से परमाणु कार्यक्रम बंद करने और परमाणु परीक्षण से परहेज करने को कहा गया था। साथ ही दोनों देशों से न्यूक्लियर हथियार ले जाने में सक्षम बैलिस्टिक मिसाइलों के डेवलपमेंट को रोकने का आग्रह भी किया गया था। हालांकि भारत इस प्रस्ताव को मानने के लिए बाध्य नहीं है।

<https://www.bhaskar.com/db-original/news/wang-5-can-hear-the-conversation-750-km-away-what-is-the-danger-to-india-130652294.html>

Wed, 07 Dec 2022

## **Jaishankar Says Ties with China cannot be Normal if Beijing Continues Trying to Change LAC**

India's relations with China cannot be normal as long as Beijing tries to unilaterally change LAC and continues to build up forces along the border, External Affairs Minister S Jaishankar said on Wednesday. Replying to queries by MPs after his suo motu statement on foreign policy in Rajya Sabha, the minister said India has made it clear to China that it will not tolerate any unilateral change in the Line of Actual Control (LAC). "Diplomatically, we have been very clear. We have been very clear with the Chinese that we will not tolerate any unilaterally change to the Line of Actual Control. And that so long as they continue to seek to do that, and if they have built up forces, which in our minds constitute a serious concern in the border areas, then our relationship is not normal," he said.

China is reported to have built up military infrastructure along the Line of Actual Control in Ladakh. Earlier this year, a top US general had described the Chinese activity along the LAC as eye-opening. "And the abnormality of that (relations) has been in evidence in the last few years," Jaishankar said on Wednesday. He said the military commanders of the two countries continue to engage each other. "I think given the sensitivity of that matter, it is something which is left to the military commanders to deal with," he said. He went on to add that the House should be understanding of the national sensitivity of such a delicate matter. Last month, the minister stated that the current standoff on the LAC has been "mischievously conflated" with resolving the boundary question. Relations between the two countries can only become sustainable on the basis of mutual respect, mutual sensitivity and mutual interest, he had said. The Indian Army and the Chinese People's Liberation Army (PLA) have been locked in a standoff in multiple areas along the LAC in eastern Ladakh since May 2020.

<https://www.newindianexpress.com/nation/2022/dec/07/jaishankar-says-ties-with-china-cannot-be-normal-if-beijing-continues-trying-to-change-lac-building-2525938.amp>

## **ThePrint**

Wed, 07 Dec 2022

## **First G20 Sherpa Meeting Concludes in Udaipur under India's Presidency**

*By Ayushi Agarwal*

On their last leg of the G20 meeting in Udaipur, delegates visited the historic Kumbalgarh fort and Ranakpur temple today after three days of substantive discussions on ambitious agenda where the meeting saw full and active participation by G20 Members, 9 guest countries and 14 international organizations. The delegates were excited to visit the Kumbhalgarh fort, a UNESCO world heritage site, nestled on the gorgeous Aravalli hills, built in the 15th century AD

by Rana Kumbha. It is encompassed by a gigantic wall reaching over 36 kilometres. Over 200 kites were seen flying over the fort while the delegates toured the fort's historical ruins, terraces, and temples.

After that, the delegates visited the 15th-century architectural marvel – the Ranakpur temple – located on the banks of the River Magai. With intricate designs and architectural finesse, the temple complex encompasses the Parshavanath Temple, Chaumukha Temple, Surya Temple and the Amba Mata Temple. With over 1,400 pillars and intricately carved details, this significant Jain temple is a testament to India's rich diversity and history of oneness with nature. The delegates received a glimpse into Rajasthan's vibrant history and unbroken traditions continuing for millennia during the tour. During their visit, the delegates also witnessed a unique cultural experience of many flavours of Rajasthan. Also, they took a tour of the renowned Crafts village, Shilpgram, where they were captivated by the diversity of Rajasthani arts and crafts which were showcased. The delegations were also treated to a luminous and colourful musical treat at the historic Manek Chowk, Udaipur, in the evening.

The first Sherpa meeting has set the tone for forthcoming meetings in 32 different G20 workstreams, including the Sherpa Track, Finance Track and Engagement Groups. The substantive discussions on prevailing global challenges, and the warm hospitality with the motto 'Atithi Devo Bhava', resonated throughout the G20 Sherpas meeting and we're highly appreciated by all delegates. Rounding up the fruitful deliberations of the past three days, India's G20 Sherpa highlighted focal areas of discussion and stressed the need to reinforce the collective action of the G20 nations. The overarching theme of India's Presidency — Vasudhaiva Kutumbakam – One Earth. One Family. One Future – resonated throughout the proceedings. The first G20 Sherpa meeting began on December 4 in Udaipur, Rajasthan. India officially assumed the G20 presidency on December 1.

<https://theprint.in/world/first-g20-sherpa-meeting-concludes-in-udaipur-under-indias-presidency/1253828/>

## अमेरिका ताइवान को देगा सबसे खतरनाक लड़ाकू विमान

अमेरिका के राष्ट्रपति जो बाइडेन के प्रशासन ने ताइवान को दो नए महत्वपूर्ण हथियार सौदों की मंगलवार को मंजूरी दे दी। इस कदम से चीन के नाराज होने की पूरी संभावना है। अमेरिकी विदेश मंत्रालय के अनुसार, ताइवान के एफ-16 लड़ाकू विमानों के बेड़े, जी-130 परिवहन विमानों और अमेरिका द्वारा आपूर्ति किए जाने वाली अन्य हथियार प्रणालियों का समर्थन करने के लिए 42.5 करोड़ डालर से अधिक के

अतिरिक्त विमान पुर्जों की बिक्री को मंजूरी दे दी गई है। इंडोनेशिया में अमेरिकी राष्ट्रपति जो बाइडेन और चीन के राष्ट्रपति शी जिनपिंग के बीच हुई आमने-सामने की मुलाकात के महज दो सप्ताह बाद ही यह घोषणा की गई है।

गौरतलब है कि चीन का दावा है कि ताइवान उसका हिस्सा है और वह विदेशी अधिकारियों की ताइवान यात्रा का विरोध करता है। अमेरिका

## पोलैंड को 'अब्राम्स' टैंक की बिक्री की मंजूरी दी

वाशिंगटन, 7 दिसंबर (एपी) ।

अमेरिका के राष्ट्रपति जो बाइडेन के प्रशासन ने उत्तर अटलांटिक संधि संगठन (नाटो) के अपने सहयोगी पोलैंड को करीब चार अरब डालर के उन्नत टैंक, अन्य लड़ाकू वाहनों और हथियारों की बिक्री को मंगलवार को मंजूरी दे दी। विदेश मंत्रालय के अनुसार, उसने पोलैंड को 116 एम1ए1 अब्राम्स युद्धक टैंक और अन्य उपकरण खरीदने की अनुमति दी गई है, जिसमें लगभग 3.75 अरब अमेरिकी डालर मूल्य के विभिन्न गोला-बारूद शामिल हैं। मंत्रालय ने कहा कि उसने सहयोगी देश दक्षिण कोरिया को

1.5 अरब अमेरिकी डालर के चिनूक हेलिकाप्टर की बिक्री को भी मंजूरी दे दी है।

मंत्रालय के अनुसार, दोनों मंजूरी अमेरिकी राष्ट्रीय सुरक्षा हितों के तहत दी गई है। इससे रूस तथा उत्तर कोरिया से खतरों का सामना कर रहे किसी भी क्षेत्र में बुनियादी सैन्य संतुलन नहीं बदलेगा।

मंत्रालय ने एक बयान में कहा कि पोलैंड द्वारा अब्राम टैंक की खरीद 'नाटो सहयोगी की सुरक्षा में सुधार करके अमेरिका की विदेश नीति के लक्ष्यों और राष्ट्रीय सुरक्षा उद्देश्यों का समर्थन करेगी, जो यूरोप में राजनीतिक स्थिरता व आर्थिक प्रगति के लिए सहायक है।'

की प्रतिनिधि सभा की अध्यक्ष नैन्सी पेलोसी के अगस्त में ताइवान की यात्रा करने के बाद दोनों देशों के बीच संबंध और खराब हो गए थे। चीन

ने इसे उकसाने वाला कदम करार दिया था और जवाब में स्व-शासित द्वीप ताइवान के आसपास कई सैन्य अभ्यास किए थे।

## **China's 'ICBMs' Rattle Australia; New Report Says 'Two-Third' of the Country within Missile Range; US to Boost Military Presence**

As tensions continue to simmer in the volatile Indo-Pacific, a worrying new assessment has claimed that China can launch missile strikes across “two-thirds” of Australia. Prime Minister Anthony Albanese announced the Defense Strategic Review in August, with the goal of “helping Defense better understand where it should prioritize investment” to “ensure the Australian Defense Force is well positioned to meet the nation’s security challenges through to 2033 and beyond.” The recently released 33-page submission to the Defense Strategic Review, worked out by former defense analysts and the RAND Corporation, contains a map showing how much the country is vulnerable to future Chinese strikes, Australian media reported. The complete report will be published in the spring of 2023. According to the submission, Australia is within striking distance of Chinese missiles. The artificial reefs and atolls in the South China Sea would allow China to launch “land-based DF-26 intermediate-range ballistic missile strikes.” China claims almost the entirety of the South China Sea and has carried out sustained militarization of the region. It has been a point of discussion for a long time that China’s DF-26 intermediate-range ballistic missile, capable of reaching targets around 3,400 miles away, could pose a threat to key US military installations in the Pacific Rim. However, this is the first time Canberra has admitted the threat to its sovereign territory and military assets.

It is pertinent to note that the DF-26 long-range missile can also carry three nuclear warheads that can be separated and fired at different targets. In addition, it also has an anti-ship variant, the DF-21D medium-range ballistic missile, which has repeatedly made headlines for its reported potential to sink US aircraft carriers. The latest submission also states that the Mischief Reef atoll, 3000 kilometers northwest of Darwin, was particularly concerning. This establishes a “ring range” across several Australian Defense Force sites in Queensland, the Northern Territory, and Western Australia. As a preventive measure against Chinese hostility, the analysts and researchers have called on the Australian administration to move the stockpiles, fuel depots, and potential military bases further south in mainland Australia.

These submissions are significant as they come after a similar assertion regarding Chinese missiles endangering the United States. In November, the US revealed that China had installed long-range ballistic missiles aboard nuclear submarines capable of striking the US, as reported by EurAsian Times. The Commander of the United States Pacific Fleet, Admiral Sam Paparo, stated that China’s six Jin-class submarines are now armed with JL-3 intercontinental ballistic missiles built to threaten the United States. The JL-3 missiles have a range of over 10,000 kilometers. This was the first time the United States officially admitted that China had deployed the weapons on its nuclear-powered submarines, allowing it to attack the US mainland from its shores. These open admissions by the western states indicate China’s rapidly expanding arsenal. Military experts believe that the tensions between the two sides could spill over into a fully-fledged conflict.



## **Expanding China Rattles Australia**

The submissions come at a time when tensions between Australia and China have risen in the region despite some diplomacy between the two sides. Earlier this year, tensions peaked when China signed a security agreement with the Solomon Islands, a small island state just miles away from Australia. The opacity surrounding the deal stoked fears that China could establish a military base 2,000 kilometers away from Canberra. The then Australian Prime Minister Scott Morrison warned that China's naval base in the Solomon Islands would be a "red line" for his country and the United States. However, the two sides have come a long way despite the animosity. Last month, Australian Prime Minister Albanese met with Chinese President Xi Jinping in a significant breakthrough after China imposed more than \$20 billion of trade strikes on Australia during years of bitter rivalry.

However, it is not clear how far the impact of the meeting will go, given some fundamental issues between the two states. Canberra, for one, is a staunch ally of Washington. Recently, Albanese played down a federal visit of MPs to Taiwan for fear of provoking China after achieving some semblance of normalcy in ties. Even though the relationship between the two states appears to have somewhat stabilized in recent months, the underlying issues remain. The NSW Liberal Senator Jim Molan recently declared that Australia had entirely lost control of the South China Sea. He said that under President Xi Jinping's leadership, China had perfected the art of the so-called "gray zone," which he defined as aggressive acts which do not evolve into an armed war. This becomes important when seen in the context of China intimidating Australian P-8A reconnaissance aircraft earlier this year.

The details of the Australian report come just days after the Pentagon warned that China's nuclear arsenal will have 1500 warheads by 2035, with Washington naming Beijing as the most significant threat to the US in a new assessment. The Pentagon also estimates China's operational nuclear weapon inventory has surpassed 400. On its part, Australia's ambition of acquiring a nuclear submarine under the AUKUS arrangement is proceeding at a snail's pace. The Chinese security pact with the Solomon Islands and its appeasement of the Pacific Island States have changed Australia's geopolitical and security calculations. Despite using diplomacy to achieve stability in ties with Beijing, Canberra remains alive to the challenges posed by its expansion and aggressiveness in the Indo-Pacific region.

## **US To Boost Australian Defenses**

Meanwhile, US Defense Secretary Lloyd Austin said that Washington would enhance the rotational presence of air, land, and sea forces in Australia, including bomber aircraft and fighters while sharing his apprehensions over Chinese belligerence. Austin said the two countries also agreed to "invite Japan to integrate into our force posture initiatives in Australia." The US and Australia share a vision of a region where nations can decide their own futures, he told a joint news conference with his Australian counterpart that included the countries' foreign ministers. "Unfortunately, that vision is being challenged today. China's dangerous and coercive actions throughout the Indo-Pacific, including around Taiwan, and toward the Pacific Island countries and in the East and South China Seas, threaten regional peace and stability," Austin said.

<https://eurasianimes.com/chinas-icbms-rattle-australia-new-report-says-two-third-of-the-country/?amp>

## **China Doubles its Nuclear Warheads to over 400 in Just 2 years; Stockpile will Rise to 1,500 by 2035: Pentagon**

In a recent provocative speech, Chinese President Xi Jinping had told the People's Liberation Army (PLA) of China to prepare for a "real war". Going by its extensive preparations, the PLA seems to have taken the statement with extreme seriousness. A report by the Pentagon has claimed that China's stockpile of nuclear weapons has increased to more than 400. in less time than anticipated by US estimates. China is focusing on increasing its nuclear capacity and may increase its nuclear stockpile to about 1,500 warheads by 2035, according to the Pentagon's annual "China Military Power" report to Congress that was released Tuesday. China has border disputes with all neighboring countries and wants to challenge its 'biggest enemy' America.

### **China's PLA doubles nuclear arsenal in 2 years**

In 2020, the US estimated China's nuclear arsenal to be just over 200. The US was estimated to double its reserves in less than a decade. But just two years later, according to the 2022 China Military Power Report released on Tuesday, China has doubled its nuclear stockpile and has reached a point where it could have 1,500 nuclear weapons by 2035 if it continues to increase its stockpile at the same pace.

### **China conducted 135 missile tests in 2021**

"What we have seen in the last few years is a really accelerated expansion," a senior US defense official told the media. China's investment on nuclear weapons in all three areas, water, land and air, is increasing the concern of the US. The report states that China has also conducted 135 ballistic missile tests in 2021, which is more than the rest of the world's total tests. These figures do not include ballistic missiles used in the Ukraine war. The report states that the Chinese military is also developing space and counterspace weapons. China has a standing army of about one million soldiers, the largest navy by number of ships, and the third largest air force in the world. The National Defense Strategy for 2022, released last month, projects China as a major challenge to the US, which top Pentagon leaders often emphasize.

<https://www.firstpost.com/world/china-doubles-its-nuclear-warheads-to-over-400-in-just-2-years-stockpile-will-rise-to-1500-by-2035-pentagon-11726921.html>



## **US Lawmakers Decline to Add Boeing 737 MAX Exemption in Defence Bill**

US lawmakers late on Tuesday declined to add an extension to an annual defence bill of a looming deadline that would impose a new safety standard for modern cockpit alerts for two new versions of Boeing's best-selling 737 MAX aircraft. The US planemaker has been lobbying for

months to convince lawmakers to waive the deadline that affects its MAX 7 and MAX 10 airplanes and was imposed by Congress in 2020 after two fatal 737 MAX crashes killed 346 people in Indonesia and Ethiopia. There is a slim chance the defence bill could be changed before final passage and Boeing is still attempting to convince lawmakers to attach the proposal to a bill that could be considered to fund US government operations but sources briefed on the matter say the issue may slip into 2023. That would be a significant setback for Boeing, which did not immediately comment but has argued previously it is better to have a common alerting system for all versions of the 737 MAX.

The requirements for modern cockpit alerts were adopted by Congress as part of certification reform passed after two fatal 737 MAX crashes in 2018 and 2019 that led to the plane's 20-month grounding. After Dec. 27, all planes must have modern cockpit alerting systems to be certified by the Federal Aviation Administration (FAA), which could jeopardize the MAX 7 and 10 future or mean significant delays for the new aircrafts' deployment.

Boeing has won about 1,000 orders for the MAX 7 and MAX 10 and previously warned that without an extension of the deadline it could be forced to cancel the two versions. Last month, acting FAA Administrator Billy Nolen said he believes the agency cannot continue any MAX certification work after the deadline without congressional action. Many lawmakers support the measure as do some pilots' unions. Senate Commerce Committee chair Maria Cantwell last week drafted a proposal that would grant exceptions for the two MAX variants if they include safety enhancements "such as enhanced angle of attack (AOA) and a means to shut off stall warnings and overspeed alerts, for all MAX aircraft" according to the summary document reviewed by Reuters.

Families of some MAX crash victims are opposed as is CB "Sully" Sullenberger, who rose to fame in 2009 as a commercial pilot who safely landed an Airbus A320 on New York's Hudson River after hitting a flock of geese. Nadia Milleron, whose daughter Samya Rose Stumo died in the 2019 Ethiopian Airlines crash, praised lawmakers for not including the extension in the defence bill. "It does not belong in a must-pass bill," Milleron said. "It is something serious -- it is public safety."

<https://www.wionews.com/world/us-lawmakers-decline-to-add-boeing-737-max-exemption-in-defence-bill-540909>



*Thu, 08 Dec 2022*

## **Fortress on Wheels: Russia Flaunts its Heavy-Duty Armored Train Used for Critical Military Missions in Ukraine**

*By Ashish Dangwal*

The video shows the movement of an armored train, with soldiers sitting behind the windows "covering" the surrounding area with anti-aircraft guns, machine guns, and sniper rifles. The crew of the 23-millimeter anti-aircraft guns can be seen stationed on open-top carriages in the footage. When the train stops, sappers and mine detectors check the bridges and railroad tracks.

According to the defense ministry, the special train is designed for technical reconnaissance, mine clearance, and the restoration of the railway track and small man-made constructions with minimal destruction. Vyacheslav, the head of the anti-aircraft gun crew, said, “during the movement, we identify low-flying air vehicles with the possibility of hitting up to 1.5 kilometers. Also, fortified positions ground lightly armored vehicles with the possibility of hitting up to 2.5 kilometers. We also support our troops – this is the most basic caliber on our train.”

The additional task of the armored train is to guarantee the security of trains carrying different types of cargo, personnel, and equipment. If required, the train can also serve as a reliable cover for trains carrying civilians. The head of the special train, Sergey, said, “It’s a cover platform. It goes first. Its main task is to be the first to take the blow when explosive devices are triggered. It contains materials of the upper structure of the tracks, which allow us to restore the destroyed sections as soon as possible.” Izvestia, the state-run news outlet, recently published a video that featured the armored train named Amur. A similar train, known as the Yenisei, was dispatched in March to Melitopol in the southeast Ukrainian Zaporizhzhia Oblast, which Russia annexed in September. According to an Izvestia journalist’s post on Telegram, the armored train was used to inspect potentially hazardous track sections. The reporter said the train could also be combat saboteurs since it is equipped with the ZU-23-2 anti-aircraft gun.

### **Russia’s Armored Trains**

Russia is believed to possess four armored trains from the post-Soviet era. However, by the late 2000s, these trains had mainly been disassembled. Defense Minister Sergey Shoigu authorized the restoration of these trains into combat service in 2016. In 2016, two of them, Baikal and Amur, participated in a logistical exercise that included operations in Crimea. It was the first time Russia’s armored trains had engaged in drills anywhere in the country in 15 years. Russia’s armored trains can transport tanks and APCs in several combinations. They also have armored carriages that are loaded with anti-aircraft weapons and artillery. The locomotives are heavily protected against kinetic strikes.

The typical objectives of these trains include escorting supply trains, maintaining rails in combat zones, removing mines, protecting crucial logistical hubs, and backing up infantry. They can also transport valuable items and personnel. Brent M Eastwood, Defense and National Security Editor at 19FortyFive, a foreign policy web magazine, previously told EurAsian Times that the deployment of these armored trains demonstrates the Russians’ concern and perhaps desperation about their logistical supplies coming under attack. He noted, “the guns on the armored trains can protect against the Turkish TB2 unmanned aerial system that the Ukrainians are flying to significant effect.”

Similar to the Soviets, the Russian military transports almost everything by rail system. Additionally, trains are used for the majority of transportation in Ukraine. “These trains seem like they come out of something you would see in the early stage of the Cold War, so it shows that the Russians are digging deep into their arsenal of tools to fight Ukraine,” Eastwood noted. Russia is the largest country in the world by land, yet its roadways are in poor shape compared to Western nations. This helps to explain why trains are so crucial to the nation’s and army’s logistics. Given these facts, the Russian military may consider that these armored trains offer additional capabilities to support Moscow’s action in Ukraine.

<https://eurasianimes.com/fortress-on-wheels-russia-flaunts-its-heavy-duty-armored-train-used-for-critical-military-missions-in-ukraine/>

## How Ukraine is ‘Targeting’ Airfields Deep Inside Russia with ‘Audacious’ Drone Attacks

With the war in Ukraine approaching the 10-month mark, a fresh escalation was reported late Monday with Moscow intercepting Ukrainian drones allegedly used to bomb airfields deep inside Russia. Russia responded to the attack on its airfields in Ryazan and Saratov — far from the frontlines — with another wave of missile strikes across Ukraine, killing at least four and causing power outages as an alarmed Kyiv rushed to stabilise its electricity grid severely affected by prior airstrikes. On Tuesday, Russia reported a third drone attack, this time on an airfield in Kursk. Citing video footage and the statement of the region’s governor, Roman Starovoyt, The Guardian reported that a drone struck an oil tank at the airfield but the fire was “localised”. Starovoyt did not directly blame Ukraine for the attack but had hit out at the country’s armed forces for shelling the border areas of Kursk Oblast on the Russian side.

### Ukraine’s ‘Audacious’ attacks

With Moscow accusing Kyiv of shelling the Zaporizhzhia nuclear power plant occupied by Russian troops, drone attacks on Ryazan and Saratov military airfields Monday, as well as the attack on Kursk Tuesday, have stood out as particularly “audacious” to international media and observers. The reasoning behind this label lies not only in the locations of the three airfields — Ryazan is some 200 km southeast of Moscow, Saratov is around 300 km west of Russia’s border with Kazakhstan and Kursk is over 100 km northeast of Russia’s pre-war borders with Ukraine — but also in the weaponry allegedly used by Ukraine to target Russian aircraft.

As explained by Pjotr Sauer and Luke Harding for The Guardian, Russian aircraft primarily targeted at both airfields are the Tupolev Tu-95. These aircraft — along with Tupolev Tu-22, also stationed at Ryazan’s Dyagilevo base, and the Tupolev Tu-160 stationed at Saratov’s Engels-2 base — have been reportedly used by Russia to conduct airstrikes on Ukraine. “Since October the Kremlin had used these strategic bombers to wreck Ukraine’s energy infrastructure, bit by bit, leaving millions without heat and electricity as winter arrives,” Harding writes about the aircraft. “The explosion at the Engels-2 airfield led to anger among some prominent Russian pro-war bloggers who blamed the country’s military for the inability to protect its airbases,” Sauer reported on reactions in Russia.

### ‘Tactical Ingenuity’?

Labelling the attacks as a sign of Ukraine’s “tactical ingenuity”, Harding further comments on speculation that Ukraine has developed a drone with a 1,000 km range to carry out such strikes and cites Ukrainian officials’ claims on previous usage. However, verifiable details remain scant, with the most recent source from the Ukrainian side appearing to be the tech news website Mezha.media. In October, the website reported that Ukraine’s state-run defence industry conglomerate Ukroboronprom had announced tests for a UAV, “either a drone or a cruise missile” with a range of 1,000 km. The UAV was being developed in response to the Iranian-made Shahed-136 kamikaze drones Russia deployed in attacks on Ukrainian cities in September.



“Range is 1000 km, weight of the combat unit is 75 kg. Putting the final touches on this one...Ukroboronprom has been operating in enhanced mode since the full-scale invasion. We almost tell you nothing (believe us), but this “nothing” works successfully in the battlefield, and some “nothing” gets successful trials from time to time,” Ukroboronprom stated on its Facebook page in October. The conglomerate has yet to directly confirm whether its weaponry was used in Monday’s airfield attack. However, earlier Tuesday, it expressed continued support for the Ukrainian armed forces’ efforts and posted a photo album of what appeared to be warheads marked with text.

“A number of stages of successful trials are behind us. In order to fulfil the instructions of [Ukraine’s armed forces], we are moving to the stage of tests under the effect of electronic warfare...After we successfully test the drone under the influence of EW (electronic warfare), we hope to be able to test it in combat use. We promised to do it by the end of this year, we are trying to fulfil this promise,” Mezha.media quoted Ukroboronprom spokesperson Nataliia Sad as saying. Meanwhile, the Russian Defence Ministry has made its own claim on the drone weaponry allegedly employed by Ukraine to carry out the attacks on its airfields, Soviet-made UAVs which, according to arms experts cited by the New York Times, may be the Tupolev TU-141 Strizh — a drone developed by the Soviet Union in the early 1970s and retired in 1989, that Ukraine now seems to have “repurposed”. “Analysts say it can fly at 600 miles per hour at low altitudes, much like some cruise missiles, making it difficult to detect and shoot down,” added the NYT report.

<https://theprint.in/world/how-ukraine-is-targeting-airfields-deep-inside-russia-with-audacious-drone-attacks/1252049/>



*Thu, 08 Dec 2022*

## **Ukraine War: Germany ‘Runs Low’ on Ammunition & Is Critically Dependent on China to Restock its Arsenal**

*By Ashish Dangwal*

While military assistance to Ukraine is depleting Germany’s ammunition reserves, a recent report by the German-language newspaper, Die Welt, suggests the slowdown in component imports from China could worsen the issue. The report said that German ammunition manufacturers recently warned about the waiting period for orders of cotton linters from China — a crucial component for propelling charges for small guns and artillery — has tripled to up to nine months. German ammunition makers flagged this information at a recent defense symposium near Munich. The German government hosted a roundtable discussion with ammunition manufacturers on November 28; however, no specific outcomes were made public.

Industry sources said that all European ammunition producers depend on China for cotton linters, even though it is a commodity produced and traded globally. Wolfgang Hellmich, the defense affairs speaker for the in-power Social Democratic Party (SPD) in parliament, told Asia Nikkei that the significant supply shortages of China-sourced materials for military equipment are particularly problematic for ammunition and specific steels. He said that at the roundtable on

ammunition, the officials addressed how to swiftly alleviate bottlenecks in the supply of ammunition and that all parties were working nonstop to find ways to avoid significant inventory gaps. The management of the German ammunition manufacturer MEN Metallwerk Elisenhuette reportedly chastised the government for being slower than other European nations to place orders with the defense industry.

The Bundeswehr, the German military, has realized that its stocks would be utterly insufficient for such high-intensity conflict in the wake of Russia's daily artillery shelling of tens of thousands of rounds into Ukraine. After Russia invaded Ukraine, the SPD-led administration of Chancellor Olaf Scholz set up a special 100 billion euro (\$106 billion) budget to modernize its under-equipped armed forces. The administration is in a dilemma because Germany is simultaneously providing ammunition to Ukraine's military, including ammo for machine guns, anti-aircraft guns, and multiple rocket launchers. Henning Otte, a member of the opposition Christian Democratic Union (CDU) and the deputy chair of the Bundestag's defense committee, claimed that the reliance on China is causing difficulties in the stockpiling effort. The US defense firms also employ rare earth, raw materials, and components from China. Timothy Heath, a senior international defense researcher at RAND Corporation, said that "this reflects the globalized nature of production. Department of Defense policymakers are trying to persuade the companies to reduce or eliminate their reliance on Chinese suppliers."

### **German Ammo Stocks Are Running Low**

Germany is running out of ammunition as it transfers armaments into Ukraine in light of the prolonged conflict. Germany is far from meeting the alliance's requirement that each member keeps enough weapons to last 30 days of battle. Furthermore, Berlin's need for weapons has increased due to the federal government providing Ukraine with weapons from the Bundeswehr stockpile. Eva Hoegl, the defense commissioner for the German Parliament, previously stated that her nation needs an extra 20 billion euros (\$19.4 billion) to buy enough munitions to satisfy NATO criteria. Germany continues to supply Ukraine with weapons, making it one of the biggest European supporters of Kyiv. The high-value equipment transferred to Ukraine includes self-propelled howitzers, multiple-launch rocket systems, anti-aircraft systems, and counter-battery radar.

Previously, German Chancellor Olaf Scholz said, "We delivered whatever we had: anti-tank and anti-aircraft systems, mines, guns, tons of ammunition, and non-lethal aid. Since then, we've progressed to more intricate and valuable systems." Officials from Europe declared that Russia could not be allowed to win in Ukraine and that they would continue to help Ukraine. However, they all expressed concern about domestic defense requirements. The war has put a burden on the NATO nations' already-dwindling arsenals. Some allies sent all their reserve Soviet-era weapons and are awaiting replacements from the US. Furthermore, European nations may find it challenging to replenish their arsenal quickly since they no longer have a robust defense industry to produce replacements. Instead, many of them depend on the American defense industry. Nevertheless, according to experts, it will take time to replenish stocks and recover the ability to produce weapons. The whole process might necessitate greater infrastructure investment in some small nations.

<https://eurasianimes.com/ukraine-war-germany-runs-low-on-ammunitions-is-critically/>

*Wed, 07 Dec 2022*

## **UK Orders Thousands More Anti-Tank Weapons to Bolster Stockpiles**

Thousands of new anti-tank weapons will be assembled in Northern Ireland and delivered to the British Army, Defence Secretary Ben Wallace announced today (7 December). A £229 million deal has been agreed with Swedish manufacturer Saab for Next Generation Light Anti-Tank Weapon (NLAW) systems, which are assembled at Thales' facility in Belfast, Northern Ireland. The UK has provided thousands of NLAWs to Ukraine to support the defence of their nation following Russia's unprovoked and illegal invasion. With NLAW, a single soldier can take out a heavily protected modern main battle tank from 20 to 800 metres away.

### **Defence Secretary Ben Wallace said:**

These next generation light anti-tank weapons have played a decisive role in supporting Ukraine's army to drive back Russia's illegal invading forces. Working with our first-class industry partners, we are continuing to fulfil our commitment to NATO by ensuring our Armed Forces will receive a steady supply of these weapons over the coming years, whilst supporting UK jobs across the length and breadth of the country. Secured through Defence Equipment and Support – the MOD's procurement arm – today's agreement will see several thousand units delivered to UK Armed Forces across 2024-2026, in addition to around 500 being delivered in 2023 through a separate procurement.

NLAW is a shoulder-launched missile system that attacks a tank from above. It combines the simplicity of light anti-armour weapons with the advantages of heavy, crew-operated guided missile systems. It is as a result of this agility, reliability and accuracy that the NLAW has been an important capability in Ukraine's fight back against Russia's illegal invasion, making up part of the 10,000 anti-tank weapons the UK has supplied to the Ukrainian armed forces. The UK continues to be actively engaged with industry, allies and partners to ensure we can equip Ukraine with vital military support while replacing, at pace, equipment and munitions granted in kind from UK stocks.

<https://www.gov.uk/government/news/uk-orders-thousands-more-anti-tank-weapons-to-bolster-stockpiles>



*Thu, 08 Dec 2022*

## **US Approves \$4b Sale of Abrams Battle Tanks to NATO Ally Poland**

The Biden administration on Tuesday approved a nearly USD 4 billion sale of advanced tanks, other combat vehicles and a large amount of assorted weaponry to NATO ally Poland at a time of heightened security concerns because of the war in neighbouring Ukraine. The State

Department said it had given the OK for Poland to purchase 116 M1A1 Abrams Battle Tanks and other equipment, including tens of thousands of rounds of various ammunition, worth approximately USD 3.75 billion. At the same time, the department said it had also approved a USD 1.5 billion sale of Chinook helicopters to treaty ally South Korea. The department said both sales were in support of US national security interests and would not alter the basic military balance in either region, which are facing threats from Russia and North Korea.

The Abrams tank purchase by Poland “will support the foreign policy goals and national security objectives of the United States by improving the security of a NATO ally that is a force for political stability and economic progress in Europe,” the department said in a statement. It added that the tanks and other equipment would “improve Poland's capability to meet current and future threats by providing a credible force that is capable of deterring adversaries and participating in NATO operations.” The sale of the Chinook helicopters to South Korea will improve Seoul's “capability to meet current and future threats by strengthening its army heavy lift capability,” the department said in a separate statement. The choppers “will allow (South Korea) to conduct missions in support of bilateral operational plans which include, but are not limited to, medical evacuation, search and rescue, parachute drops, and disaster relief,” it said.

<https://www.dailypioneer.com/2022/world/us-approves--4b-sale-of-abrams-battle-tanks-to-nato-ally-poland.html>

## Science & Technology News

### Business Standard

*Wed, 07 Dec 2022*

#### **ISRO to Develop Spatial Infrastructure Geoportal for Ladakh: Union Minister**

The government of the Union Territory of Ladakh has approached the Indian Institute of Remote Sensing (IIRS), a unit of the Indian Space Research Organisation (ISRO) for developing "Spatial Data Infrastructure geoportal 'Geo-Ladakh' for UT-Ladakh, said Union Minister of State for Science and Technology Jitendra Singh on Wednesday. In a written reply to a question in the Lok Sabha, Singh said, the project encompasses spatial database generation (water resources, vegetation and energy potential) using remote sensing, geospatial techniques and the development of a Geo-portal for hosting this database. According to the Department of Space, Singh said that the project also aims towards training of UT-Ladakh officials on Geospatial techniques and applications. Portal provides geospatial data visualization and analytics for UT-Ladakh, consisting of Spatial viewer, Carbon Neutrality, Geospatial utility mapping and Geo-Tourism.

He further said that a Memorandum of Understanding was also signed between IIRS (ISRO) and UT-Ladakh Administration on January 1, 2022, towards carrying out the above work. "The potential of space technology could be used for generating the spatial database on time series

snow cover, freshwater availability, sites for renewable energy potential (solar and wind), availability of alpine pastures/grazing lands for natural resource management and change assessment at a periodic interval," he said. Singh further said that presently, ISRO is setting up an optical telescope at Hanle for tracking spacecraft and space objects.

[https://www.business-standard.com/article/current-affairs/isro-to-develop-spatial-infrastructure-geoportal-for-ladakh-union-minister-122120800099\\_1.html](https://www.business-standard.com/article/current-affairs/isro-to-develop-spatial-infrastructure-geoportal-for-ladakh-union-minister-122120800099_1.html)



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

**Ministry of Science & Technology**

*Wed, 07 Dec 2022*

## **First Data Taken by the 3.6-Meter Telescope Detects Unexpected Kilonova Emission from ‘A Long-Duration Gamma-Ray Burst’**

While tracing a burst of high-energy light detected on December 11, 2021, from the outskirts of the Milky Way located approximately 1 billion light-years away, astronomers have spotted the first astronomical event in which a long GRB has been accompanied by the unexpected discovery of a kilonova emission. Generally, kilonova are visible and infrared light associated with short-period gamma-ray bursts (GRBs) thought to be heat produced by the radioactive decay of heavier elements. Photometric observations taken with the 3.6 m Devasthal Optical Telescope have provided vital information on the earliest phase of a kilonova ever detected, radically changing the understanding of scientists about the origin of GRBs.

GRBs are powerful astronomical cosmic bursts of high-energy gamma-ray. GRB emits more energy in a few seconds than our Sun will emit in its lifetime and has two distinct emission phases: the short-lived prompt emission (the initial burst phase that emits gamma-rays), followed by a long-lived multi-wavelength afterglow phase. The prompt emission (initial gamma-ray emission) of GRBs are automatically discovered by space-based gamma-ray missions such as NASA's Fermi Gamma-ray Space Telescope, Neil Gehrels Swift Observatory, and India's AstroSat. In recent years, scientists have discovered a special phenomenon called a kilonova of visible and infrared light with short-period GRBs, also known as a potential source of gravitational waves.

It has been hypothesized that the heat produced by the radioactive decay of heavier elements may emit kilonova. This process also produces heavier elements, such as gold and platinum. However, observing kilonovas at near-infrared wavelengths is technically challenging, and only a few telescopes on Earth, including the 3.6-meter Devasthal Optical Telescope of the Aryabhata Research Institute of Observational Sciences (ARIES), can detect kilonova and gravitational wave objects at these wavelengths upto faint limits. The scientists from the ARIES, an autonomous institute of DST, used data from the 3.6 m Devasthal Optical Telescope of the Aryabhata Research Institute of Observational Sciences (ARIES) along with other telescopes,



including HST in studying the aftermath of the long GRB (GRB 211211A), detected by the NASA's Neil Gehrels Swift Observatory and the Fermi Gamma-ray Space Telescope on December 11, 2021. The high-energy outburst lasted about a minute, and follow-up observations taken from the 3.6-meter Devasthal Optical Telescope identified a kilonova.

The spectral energy distribution of GRB afterglow is usually explained in terms of non-thermal emission (due to synchrotron radiation). However, in this event, both thermal and non-thermal emissions were included in the spectral energy distribution of the afterglow, modeled using the magnificent and dim observations of the 3.6 m Devasthal Optical Telescope. After subtracting the afterglow contribution from the collected data taken using the 3.6 m telescope and 4Kx4K CCD IMAGER, the scientists, which include PI of the backend instrument Dr. Shashi Bhushan Pandey along with research students Rahul Gupta, Amar Aryan, Amit Kumar, and Dr. Kuntal Mishra found that the multiwavelength data could be well explained by additional thermal spectra and that this thermal emission could be explained in terms of kilonova emission.

"Several years ago, Neil Gehrels, an astrophysicist and namesake of Swift suggested that some long-duration GRBs may be produced by merging neutron stars. By GRB standards, this event was relatively nearby, allowing space and ground-based telescopes to capture the dim light of the kilonova. Kilonovae may also arise from more distant long GRBs, but we have not yet been able to see them through observations," said Eleonora Troja, an astrophysicist at the University of Rome who led the team on the study. Dr. Shashi Bhushan Pandey and the team of Indian scientists involved in this work said that this discovery challenges our current understanding about the origin of GRBs and gives rise to new possibilities in this area of research. Professor Dipankar Banerjee, Director, ARIES, pointed out that future time-domain astronomy has a unique potential to make a lot of such discoveries using the 3.6 m Devasthal optical telescope.

In addition to the first data taken by the 3.6-meter telescope, this scientific discovery, published in the journal Nature, also used Hubble Space Telescope, Multicolor Imaging Telescopes for Survey and Monstrous Explosions, Color Alto Observatory, Devasthal Fast Optical Telescope, and many other spaces and ground-based telescopes. It will help in understanding the process of formation of heavy elements in the universe.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1881622>



*Wed, 07 Dec 2022*

## **Spacecraft for ‘Gaganyaan’ Mission Developed: ISRO Scientist**

The Indian Space Research Organisation (ISRO) has developed a spacecraft for carrying astronauts to space as part of the ambitious ‘Gaganyaan’ mission and the crew module that has been successfully designed is under production. The coming year is crucial for the mission as a series of tests will be undertaken with the test vehicle already developed for a couple of unmanned missions before the manned mission takes off. Disclosing the ISRO’s progress of ‘Gaganyaan’ mission at the three-day national conference on “Futuristic strategies for the sustainment of troops in different terrains”, organised by the DRDO-DFRL in Mysuru, R.

Umamaheshwaran, Director, HSFC, ISRO, Bengaluru said the pandemic affected the mission's progress and the project now has gained full momentum. This pan-world programme has been supported by Russia, Japan and agencies including NASA besides the academia and the industry. Nearly 700 industry partners are involved with the ISRO in the mission.

Describing 'Gaganyaan' a "complex programme" and most challenging one, the ISRO scientist said the astronauts identified for the mission have successfully undergone training in Russia and are also undergoing another round of training in Bengaluru at the astronaut training centre. The DFRL was developing food for the astronauts and the thermo-stabilised food has been developed for them because of its simplicity, he added.

### **Phase of testing**

Dr. Umamaheshwaran said the 'Gaganyaan' has entered a phase where a lot of testing will be carried out, including the crew escape system - in the ascent phase, orbital phase and descent phase. The crew health monitoring system has also been developed. The space scientist said the ISRO's plan of carrying humans to space was actually thought of 20 years ago as a study team was constituted to understand its feasibility and explore the methodologies to be involved for the project. Another team was formed to study what technology has to be employed and the launch vehicle required for the mission. In 2012, an initial project study was constituted and the ISRO decided to take up the challenge after undertaking a wide range of studies. Prime Minister Narendra Modi announced 'Gaganyaan' mission in 2018. "It's been four years now and a lot of work has been done. We lost time because of COVID-19 but the project is in brisk phase now, with the launch vehicle – a most powerful rocket – developed, and the liquid engine test already done successfully," he told the gathering.

<https://www.thehindu.com/news/national/karnataka/spacecraft-for-gaganyaan-mission-developed-isro-scientist/article66235226.ece>

# **The Tribune**

*Thu, 08 Dec 2022*

## **China Poses Burgeoning Threat in Space**

*By C Uday Bhaskar*

WHILE the mention of growing Chinese nuclear arsenal in the annual US Department of Defence report to the US Congress made global headlines, greater attention, perhaps, should be paid to what it has said about Beijing's growing space activity and the implications for its war-fighting capabilities. An indicator of Chinese activity comes from the fact that this year, the Chinese have sent up 55 rockets. The US leads with 80 launches and the Russians came a poor third with 22. Beijing's maturity as a space-faring power was confirmed earlier this year when it added the third and last module to its Tiangong space station, which has been occupied by three-man crew since June 2021.

According to the Pentagon report, the Chinese are investing heavily in space and putting money into everything from intelligence assets to weapons such as kinetic-kill missiles and ground lasers. Since 2018, China has almost doubled its intelligence, surveillance and reconnaissance

(ISR) satellites that are now more than 260, which is about half of the entire world's ISR systems. China has one of the most-advanced space programmes in the world and its origins lie in its military doctrine. The Chinese programme was launched by the Fifth Academy of the National Defence Ministry in 1956 and launched its first satellite in 1970.

But today, China has a broad-based programme that includes human space flight, exploration missions to Mars and the moon, alongside the military applications such as enabling long-range precision strikes and using satellite-based command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) and at the same time denying them to adversaries. The military applications come under the PLA's Strategic Support Force (SSF), which was set up in 2015 and has since centralised all of the PLA's strategic space, cyberspace, electronic and psychological operations. It has two broad divisions — the Space Systems Department (SSD) responsible for military space operations and the Network Systems Department (NSD), which handles information warfare.

The SSF space activities are about war fighting and war winning and are deeply integrated with information warfare, which includes cyberwar, technical intelligence, electronic warfare and psychological operations. The current commander of the SSF is General Ju Qiansheng, who earlier headed the NSD. The SSF's Space Systems Department is responsible for most of PLA's space operations, including space launch and support, space surveillance, space information support, space telemetry, tracking and control and space warfare. The SSD runs the Yuan Wang space support ships, one of which created a furore when it visited Sri Lanka earlier this year. Perhaps, most significant developments are in the PLA's counter-space capabilities which seek to degrade and deny space capabilities to adversaries. China, according to the Pentagon report, believes that space-based operations are a crucial element in the US military system and has, thus, pursued a strategy to negate this American advantage. Thus, US reconnaissance, communication, navigation and early-warning satellites will be targeted early in any conflict.

In January 2007, China had tested a direct-ascent ASAT missile that destroyed an old-weather satellite. The resultant debris created a controversy and China has not undertaken such a test since then. The Chinese have also conducted anti-satellite tests using the DN-1 and 2 missiles in 2010, 2013 and 2014, and by a DN-3 missile in 2015. They claimed that these were ballistic missile defence tests, but the Americans insist that these were direct-ascent missiles aimed at ramming into satellites to destroy them. Their assessment is that these missiles are capable of taking out satellites in near geosynchronous orbits where most intelligence and navigation satellites are located. Reports on China testing a manoeuvring satellite to capture another satellite in space began to appear in 2013 and in July, China tested a deployment involving three satellites in which one of them was fitted with a mechanical arm. The Chinese claimed that this was a test of a system to collect space debris. There is little doubt that China today has the ability to neutralise adversary satellite by capturing them or knocking them off their orbit.

According to a 2020 report of the US-China Economic and Security Review Commission, the PLA also has an operational ground-based satellite electronic counter-measures capability designed to disrupt satellite communications, navigation, missile early warning and other satellites through jamming. The technology was incidentally sourced from Ukraine in the late 1990s and developed indigenously. It is well known that the Chinese also have a well-developed cyberwar capability, which can work in tandem with these jamming systems. It's clear that the PLA's advances in both kinetic and non-kinetic counter-space activities will be a serious

problem for the US, which has otherwise enjoyed enormous advantage in space. But by the same measure, India needs to think of ways to meet this burgeoning Chinese threat.

Kartik Bommakanti of the Observer Research Foundation has pointed out that India's record of heavy-launch vehicles — the type that is needed to hoist certain militarily useful satellites into the orbit — is patchy. By contrast, the Chinese Long March series “are a visible demonstration and example of the Chinese progressing more rapidly than India in the development of geosynchronous launch vehicle.” But this is not the only area where China is ahead of India. With just five launches in the past year, India can hardly compete with China. It took a tentative step forward when it created the Defence Space Agency under the Integrated Defence Staff in 2019 along with a Defence Space Research Agency. But, it needs to urgently work on a strategy to deal with the China challenge.

<https://www.tribuneindia.com/news/comment/china-poses-burgeoning-threat-in-space-458704>



*Thu, 08 Dec 2022*

## **India@100: Science will Lead the Path**

On August 15, 2022, when India turned 75, Prime Minister Narendra Modi exhorted us all to enjoin ourselves on a journey where India would transform into a developed nation by 2047 that is by the time we would have completed a century as an independent country. The keynotes of his address were the three facilitators of such a trajectory—the fact that we have become an aspirational society, that there is now a cultural and civilisational re-awakening amongst Indians, and that the world is taking our claims of attaining our rightful place at the global high table seriously. Twenty-five years are not such a long time in such a scheme of things, and it is clear that without substantial progress in science and technology, it would be difficult to attain this 'developed' tag. There should be a well-defined roadmap accordingly for Indian science if it is indeed to achieve developed status. These matters have been highlighted by the recent assumption of the Presidency of G20 last week in Bali, Indonesia.

More specifically, Science-20, or S20, the Science Engagement Group, has been set up by the Government. In no time, Union Minister Jitendra Singh chaired a high-level review meeting to oversee the preparations for the S20 Summit meetings. Scheduled to be held in Coimbatore in July next year, the theme of the S20 Summit meeting will be 'Disruptive Science for Innovative and Sustainable Growth'. Complementing those are the side events under the theme of 'Research Innovation Initiated Gathering' (RIIG). The sub-themes for RIIG gathering will be Materials for Sustainable Energy, Scientific Challenges and Opportunities towards Achieving a Sustainable Blue Economy, Biodiversity and Bio-economy and Eco-Innovations for Energy Transition. The government is hopeful that the summit will foster a cooperative climate where encouraging frameworks for environmentally friendly technologies can be created. In addition to that, technology transfers, creation of a global start-up ecosystem and assertion of IP sharing is on the agenda.

In terms of numbers, it is easy to see that with a growth rate of 7.8 per cent in GDP this year, the \$5 trillion economy target will be achieved by 2026-27 (unless there are drastic fluctuations in oil prices). With the possible switch from fossil fuels to renewables, one may envisage a \$9 trillion economy by 2031-32 and a \$40 trillion economy by 2047, whereby we would be within the top three countries of the world in absolute monetary terms and not just PPP numbers. What should we do to achieve the 2047 target? R Jagannathan and Ashish Chandorkar have written in *Swarajya* on what we must concentrate on. Additionally, we would add that education, health including pharmaceuticals and women's health, exports, taking into account demand-supply imbalances, nutrition including fertilisers, water including ocean and polar research, climate change, genomics, advanced materials including nanomaterials, robotics, electric and solar powered vehicles, drones, outer space, and IT, in general, are essential sectors where scientific methodology practised by experts needs to be translated into globally competitive technology.

Given the compressed 25-year time scale, we simply cannot avoid imported solutions in certain bottleneck areas. This requires a well thought-out foreign policy keeping India's interests paramount and noting that a country may switch between being a friend, neutral, or adversary depending on the circumstances. On the economic front, technical matters need to be synergised with issues of scalability, skill development, blockchain technology, artificial intelligence, and supply chain inadequacies—quite a package. A vital aspect of progress is a proper management of education. Since the time of India's independence, successive governments have paved the way for accessible education to all. Institutions of higher learning — IISc, IITs and IIMs have given the world a cursory glance at what India is truly capable of. Despite all this, a lot more needs to be done to modernise our education system and the overall infrastructure that facilitates it.

In this regard, the primary concern is investment. At present we spend around 0.8 per cent of our GDP on education and research. This number needs to be bootstrapped up to say 3-4 per cent of the GDP at the very least. China made these heavy investments starting around 1990: the results are apparent today with their thriving scientific ecosystem. Given the present state of our healing economy, the required amount for the government alone to bear is too much of ask. The role of the private sector in the education sphere is not just necessary but needs to attain dominance under careful regulation. However, there is yet another aspect that needs to be considered. Given again the compressed 25-year time scale, and the fact that any fundamental change in education will start showing results only after 15 years, we urgently need a strategy that optimises the usage of the resources we currently possess. In the meantime, the government should start vacating the business of running educational institutions in terms of funding, admissions, and administration. The disparities between central and state universities must be removed because the vast majority of students attend the latter.

Most of the technological and R&D heft that India needs should come from mission-oriented government laboratories with no educational component, and from corporate research laboratories that dovetail closely with government laboratories. The IITs cannot be expected to solve problems of scalability, economic leverage and supply chain management. Their activities can at most take one to the level of good start-ups but that is insufficient for the big, basic breakthroughs that India 2047 needs. The USA moved quickly in the Vannevar Bush dispensation in the early 1950s because of a perfect synergy between academia, industry and government, mostly their defence laboratories. A similar strategy is underway in China's civil-military fusion. We should aim for nothing less. The Department of Atomic Energy is a



wonderful example as to how a government scientific department should be organised, independent of educational undertakings. Beginning in the 1950s, we were subject to draconian restrictions with regard to the import of uranium ores to make fissile U-235, an essential component for nuclear weapons.

India developed its own route via thorium extracted from monazite sand beaches. India has the largest supplies of thorium in the world, with comparatively poor quantities of uranium. India has projected meeting as much as 30 per cent of its electrical demands through thorium by 2047. Our weapons programme and energy needs have a comfortable buffer support in the form of our R&D progress in thorium technology. All this was possible because the DAE was allowed to run using its own closed, carefully selected group of scientists (and a very small number of student-employees). This provision needs to be extended to all non-educational scientific laboratories and institutions that have been charged with the duty of rapidly translating science into immediately applicable technologies, strategic security, and towards products and services. The when, what, and how having been defined it now requires the political will to effect these changes so that we may all proudly hold our heads high by 2047 as citizens of a truly developed nation of the world.

<https://www.dailypioneer.com/2022/columnists/india-100--science-will-lead-the-path.html>

