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# समाचार पत्रों से चयित अंश Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO  
Technologies, Defence Technologies, Defence Policies,  
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गुरुवार, 24 नवंबर 2022

### भारत ने मध्यम दूरी की बैलिस्टिक अग्नि-3 मिसाइल का सफल परीक्षण किया

भारत ने ओडिशा के एपीजे अब्दुल कलाम द्वीप (Abdul Kalam Island, Odisha) से परमाणु सक्षम इंटरमीडिएट रेंज बैलिस्टिक मिसाइल (IRBM) अग्नि -3 का बुधवार का सफल प्रशिक्षण लॉन्च किया। यह सामरिक बल कमांड, रक्षा मंत्रालय द्वारा आयोजित नियमित उपयोगकर्ता प्रशिक्षण लॉन्च के हिस्से के रूप में किया गया। यह पहले से तय सीमा के लिए किया गया था और इस दौरान सिस्टम के सभी आपरेशनल पैरामीटर को लागू किया गया था।

#### 48 टन वजन 16 मीटर लंबी मिसाइल, की रेंज 3000 किमी से अधिक है

रक्षा मंत्रालय के एक बयान में बताया गया कि लॉन्च एक पूर्व निर्धारित सीमा के लिए किया गया था और सिस्टम के सभी आपरेशनल पैरामीटर को जांचा गया था। 48 टन वजन 16 मीटर लंबी मिसाइल, की रेंज 3000 किलोमीटर से अधिक है और यह 1.5 टन से अधिक का पेलोड ले जाने में सक्षम है। सूत्रों ने कहा कि समुद्र में तैनात कई राडारों, टेलीमेट्री ऑब्जर्वेशन स्टेशनों, इलेक्ट्रो-ऑप्टिक उपकरणों और नौसेना के जहाजों द्वारा फ्लाइंग ट्रेजेक्टरी को ट्रैक किया गया। दो चरणों वाली सॉलिड प्रोपेल्ड पॉवर वाली आईआरबीएम (IRBM) सामरिक बल कमान के आपरेशनल दायरे में है, जो भारत के परमाणु कमांड प्राधिकरण का हिस्सा है और इसे रक्षा अनुसंधान और विकास संगठन (DRDO) द्वारा विकसित किया गया है।

#### पहली बार परीक्षण 2006 में किया गया था

अग्नि-3 का पहला विकास परीक्षण जुलाई 2006 में किया गया था, लेकिन यह उम्मीद के मुताबिक परिणाम नहीं दे सका। बाद में अप्रैल 2007 में इसका सफलतापूर्वक उड़ान परीक्षण किया गया। तब से इस

प्रणाली का कई बार सफलतापूर्वक परीक्षण किया जा चुका है। अग्नि -3 का परीक्षण भारत की सामरिक महत्व की परमाणु पनडुब्बी, आईएनएस अरिहंत के एक महीने बाद किया गया है, जिसने एक सबमेरिन लॉन्च बैलिस्टिक मिसाइल (SLBM) का सफल प्रक्षेपण किया।

### **यह भारत की जवाबी क्षमता का प्रतीक है**

एसएलबीएम (SLBM) लॉन्च के बाद, रक्षा मंत्रालय (MoD) ने कहा था: “यह लॉन्च चालक दल की योग्यता (crew competency) साबित करने और एसएसबीएन कार्यक्रम (SSBN programme) को प्रमाणित करने के लिए महत्वपूर्ण है, जो भारत की परमाणु निवारक क्षमता (nuclear deterrence capability) का एक प्रमुख तत्व है। भारत की ‘विश्वसनीय न्यूनतम प्रतिरोध (Credible Minimum Deterrence)’ की नीति को ध्यान में रखते हुए एक मजबूत, उत्तरजीविता (survivable) और सुनिश्चित जवाबी क्षमता (assured retaliatory capability) है, जो इसकी ‘नो फर्स्ट यूज (No First Use)’ प्रतिबद्धता को रेखांकित करती है।

<https://www.jansatta.com/national/india-successful-launch-intermediate-range-ballistic-missile-agni-3-in-apj-abdul-kalam-island-odisha/2512337/>



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

*Wed, 23 Nov 2022*

## **India Carries Out Successful Training Launch of Intermediate Range Ballistic Missile, Agni-3 From APJ Abdul Kalam Island**

India carried out a successful training launch of an Intermediate Range Ballistic Missile, Agni-3 from APJ Abdul Kalam Island, Odisha on November 23, 2022. The successful test was part of routine user training launches carried out under the aegis of the Strategic Forces Command. The launch was carried out for a predetermined range and validated all operational parameters of the system.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1878370>

## India Successfully Test-Fires Intermediate Range Ballistic Agni-3 Missile

India on Wednesday carried out a successful training launch of the nuclear capable Intermediate Range Ballistic Missile (IRBM) Agni-3 from APJ Abdul Kalam Island, Odisha, as part of routine user training launches conducted by the Strategic Forces Command, the Ministry of Defence (MoD) said. An MoD press statement said that the launch was carried out for a predetermined range and validated all operational parameters of the system. The 16-meter long missile, weighing more than 48 tonnes, has a range of over 3000 kilometers and is capable of carrying a payload of over 1.5 tonnes. Sources said that flight trajectory was tracked by a number of radars, telemetry observation stations, electro-optic instruments and naval ships deployed at the sea.

The two-stage solid propellant powered IRBM is under operational purview of the Strategic Forces Command, which is part of India's Nuclear Command Authority and has been developed by the Defence Research and Development Organisation (DRDO). The first known developmental trial of Agni-3 was conducted in July 2006 but could not yield the expected result. It was subsequently successfully flight tested in April 2007. The system has been successfully tested several times since then. The Agni-3 test comes over a month after India's Strategic Strike Nuclear Submarine, INS Arihant, carried out a successful launch of a Submarine Launched Ballistic Missile (SLBM). After the SLBM launch, the MoD had said: "The launch is significant to prove crew competency and validate the SSBN programme, a key element of India's nuclear deterrence capability. A robust, survivable and assured retaliatory capability is in keeping with India's policy to have 'Credible Minimum Deterrence' that underpins its 'No First Use' commitment." The strategic postures of "credible minimum deterrence" and "no first use" are pivotal to India's nuclear doctrine.

<https://indianexpress.com/article/cities/pune/india-successfully-test-fires-intermediate-range-ballistic-agni-3-missile-8286084/>

## Agni III Missile Night Trial Successful

The Strategic Forces Command (SFC) of Indian Army on Wednesday successfully conducted a fresh night trial of intermediate range nuclear-capable ballistic missile Agni III from a defence test facility off Odisha coast. The Made-in-India surface-to-surface missile carrying a dummy payload blasted off from an auto-launcher at Abdul Kalam Island in full operational configuration at about 7.30 pm. This was the second night trial of Agni-III after a failed attempt in 2019. The test was considered 'very crucial' as it was to reconfirm the technical parameters set for the user and its readiness to handle the weapon during night hours. The flight trajectory of

the missile was set for the full range. The Defence Research and Development Organisation (DRDO) provided all logistic support. A defence scientist said the test proved the reliability of the weapon and reconfirmed the army's operational readiness. The missile can be fired anytime and in any terrain in short notice. All the radars, electro-optical systems located along the coast have tracked and monitored all the parameters of the missile throughout the flight path, he said.

Developed by DRDO, Agni III has already been inducted in the armed forces in 2011. Propelled by two-stage solid propellant, it is capable of carrying both conventional and nuclear warheads weighing up to 1.5 tonne. The missile is 17 metre tall and has a diameter of two-metre. It weighs around 50 tonne. The missile used in the test was picked up randomly from the production lot. Equipped with state-of-the-art avionics, advanced on-board computer, the missile has the latest features to guide in-flight disturbances. "The successful test was part of routine user training launches by the SFC. The launch was carried out for a predetermined range and validated all operational parameters of the weapon system," the Ministry of Defence said in a statement.

<https://www.newindianexpress.com/nation/2022/nov/24/agni-iii-missile-night-trial-successful-2521605.html>



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

*Wed, 23 Nov 2022*

## **DRDO'S Compendium on Low Intensity Conflict Products Released**

DRDO's Compendium on Low Intensity Conflict (LIC) Products was released jointly today by the Union Home Secretary Shri Ajay Kumar Bhalla and Secretary DDR&D & Chairman DRDO Dr Samir V Kamat. In line with the "Atmanirbhar Bharat" campaign of the Government of India, the compendium consists of more than 100 technologies, systems and products developed by DRDO for LIC operations. It is a valuable repository of information for the central security forces.

Union Home Secretary and Secretary DDR&D & Chairman DRDO jointly reviewed the ongoing collaboration between the DRDO and the Ministry of Home Affairs (MHA). The collaboration, institutionalised to develop technologies and systems for Low Intensity Conflict (LIC) operations, has helped DRDO to develop many products and systems required for the central security forces during LIC operations. The collaboration has also helped in identifying futuristic requirements for LIC operations and defining the roadmap for their development.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1878319>



Wed, 23 Nov 2022

## DRDO'S Compendium on Low Intensity Conflict Products Released

Union Home Secretary Ajay Kumar Bhalla and Chairman of Defence Research and Development Organization (DRDO) Dr Samir V Kamat on Wednesday released Compendium of Low Intensity Conflict Products developed by DRDO.



The compendium consists of more than 100 technologies, systems and products developed by DRDO for Low Intensity Conflict operations which will be a valuable repository of information for the central security forces. The compendium also provides information about the industries engaged in manufacturing the products.

<https://newsonair.com/2022/11/23/drdo-compendium-on-low-intensity-conflict-products-released/>



# DRDO on Twitter



[#DRDOUpdates](#) | Shri Ajay Kumar Bhalla, Union Home Secretary and Dr Samir V Kamat, Secretary DDR&D and Chairman DRDO today released a compendium consisting of more than 100 technologies, systems & products developed by DRDO for Low Intensity Conflict Operations.

[@DefenceMinIndia](#)



A. Bharat Bhushan Babu

5:22 pm · 23 Nov 2022 · Twitter for iPhone



[#DRDOUpdates](#) | DRL,Tezpur commemorated its Diamond Jubilee Year & Lab Raising day on 21 Nov 2022. VC of Cotton University was the Chief Guest and District & Sessions Judge Sonitpur was the Guest of Honour. Dignitaries from army & paramilitary forces also graced the occasion



5:58 pm · 23 Nov 2022 · Twitter for iPhone

### THE TIMES OF INDIA

*Thu, 24 Nov 2022*

## **Defence Minister Rajnath Singh Calls for Global Efforts to Counter Cross-Border Terror**

The gravest threat requiring urgent and resolute intervention by the international community is transnational and cross-border terrorism and “indifference” can no longer be a response as terrorism has found victims globally, defence minister Rajnath Singh said in his address to the ninth Asean defence ministers’ meeting (ADMM) Plus at Siem Reap, Cambodia, on Wednesday. “Terrorist groups have created inter-linkages across continents backed by new-age technologies to transfer money and recruit supporters. The transformation of cyber-crimes into organised cyber-attacks point to the increasing use of new technologies, by both, state and non-state actors,” he said, apprising the delegates that the UNSC’s committee on counter-terrorism met in October 2022 at New Delhi and “took serious note of these developments”. He said while terrorism continues to remain a big threat, other security concerns that have emerged in the aftermath of the Covid pandemic can’t be ignored. The ongoing geo-political developments have brought the world’s attention to the challenges of energy and food security, he added.

With the world witnessing increasing strife amplified by disruptive politics and the centre of gravity of global politics and trade shifting, a peaceful Indo-Pacific, with Asean at its core, is vital more than ever for security and prosperity of the world at large, he said. Singh said as president of UN Security Council in August 2021, India conducted a high-level debate on maritime security, which concluded with the UNSC’s presidential statement on maritime security. “The statement emphasised the fundamental importance of the UN Convention on the Law of the Sea (UNCLOS),” he said.

“India calls for a free, open and inclusive order in the Indo-Pacific, based upon respect for sovereignty and territorial integrity of all nations...” he added. With the participation of 10 Asean nations and eight major PLUS countries, ADMM Plus can position itself not just as a forum for regional security but a driver for world peace, Singh said.

<https://timesofindia.indiatimes.com/india/defence-minister-rajnath-singh-calls-for-global-efforts-to-counter-cross-border-terror/articleshow/95724504.cms>

## **Amid Aggressive Moves by China, Rajnath Singh Seeks Free, Open Indo-Pacific**

India is keeping tabs on China's aggressive moves in the South China Sea and taking steps to ensure that the Chinese navy doesn't muscle its way into the Indian Ocean where combat-ready Indian warships are carrying out round-the-clock surveillance for any unusual activity. Defence minister Rajnath Singh on Wednesday called for "a free, open and inclusive order in the Indo-Pacific", pivoting on respect for sovereignty and territorial integrity of all nations, while stressing on peaceful resolution of disputes through dialogue and under the framework of international laws at a time when China claims large portions of the disputed South China Sea, and its aggressive moves in the region threaten to escalate tensions.

"We are concerned about complicating actions and incidents that have eroded trust and confidence, and undermined peace and stability in the region," Singh said while addressing the 9th ASEAN Defence Ministers Meeting (ADMM) Plus at Siem Reap in Cambodia. Speaking at a separate event in New Delhi, Indian Navy chief Admiral R Hari Kumar said the possibility of traditional inter-state conflict in the region could not be ruled out, and there was an increased risk to the rules-based order stemming from disputes of jurisdiction, undermining of United Nations Convention on the Law of the Sea (UNCLOS), piracy, illegal human migration, and drugs and arms trafficking. The navy chief was speaking at the Indo-Pacific Regional Dialogue, organised by the Indian Navy and the National Maritime Foundation.

India is keeping tabs on China's aggressive moves in the South China Sea and taking steps to ensure that the Chinese navy doesn't muscle its way into the Indian Ocean where combat-ready Indian warships are carrying out round-the-clock surveillance for any unusual activity. "India stands for the freedom of navigation and overflight, unimpeded lawful commerce, peaceful settlement of maritime disputes and adherence to international law, particularly, the UNCLOS. We hope that the ongoing negotiations on the Code of Conduct on the South China Sea will be fully consistent with international law, in particular, UNCLOS, and should not prejudice the legitimate rights and interests of nations that are not party to these discussions," Singh said. Last year, Admiral Phil Davidson, commander of the US Indo-Pacific Command, said aggressive Chinese naval actions and asymmetric activities undermine the rules-based order and constitute a major challenge. "The Indo-Pacific region is in competition between a closed and authoritarian Beijing vision, and the idea of a free and open Indo-Pacific," Davidson said.

The ADMM-plus comes on the back of the Malabar exercise conducted by India, US, Japan and Australia off the Japanese coast at a time China is pushing for greater influence in the far seas and its warships are increasingly foraging into the Pacific and Indian Ocean regions. "With participation from 10 countries of the ASEAN and eight major 'Plus' countries, ADMM Plus can position itself not just as a forum for regional security but a driver for world peace. Together, we constitute half of the world's population," the minister said.

He added that the gravest threat requiring urgent and resolute intervention by international community was transnational and cross-border terrorism. "Indifference can no longer be a

response, as terrorism has found victims globally.” The growing realities of the contemporary world, both in geo-political and economic terms, underscore the need for a confluence of Indian and Pacific Oceans, Hari Kumar earlier said.

<https://www.hindustantimes.com/india-news/amid-aggressive-moves-by-china-rajnath-seeks-free-open-indopacific-101669229652380.html>

## THE ECONOMIC TIMES

Wed, 23 Nov 2022

### **Prosperous Indo-Pacific Hinges on Peaceful Maritime Domain: Navy Chief**

A prosperous Indo-Pacific hinges on a peaceful maritime domain, and the Indo-Pacific Oceans Initiative (IPOI) holds immense potential for synchronising and synergising the collective efforts towards achieving it, Navy Chief Admiral R Hari Kumar said on Wednesday. In his address at the fourth edition of Indo-Pacific Regional Dialogue (IPRD) here, he also said maritime terrorism and proliferation of advanced technologies have "further complicated the security matrix". The IPRD is an apex-level international annual conference of the Indian Navy that seeks to foster exchange of ideas and promote deliberations on regionally relevant maritime issues.

The theme of IPRD-2022, being held from November 23-25, is "Operationalising the Indo-Pacific Oceans Initiative (IPOI)", which was articulated by Prime Minister Narendra Modi at the 14th East Asia Summit (EAS) in Bangkok on November 4, 2019, the defence ministry said in a statement on Tuesday. "It is amply clear that a prosperous Indo-Pacific hinges on a peaceful maritime domain. The maritime security pillar of the IPOI seeks to manage this crucial element through cooperative engagement between friends and partners," the Navy chief said.

In this, the Indian Navy has been guided by the inclusive vision of SAGAR which literally means oceans, and expands as 'Security and Growth for All in the Region', and is underpinned by the values of 5 Ses -- 'Samman' (Respect), 'Samvaad' (Dialogue), 'Shanti' (Peace), 'Samriddhi' (or Prosperity) and notably, 'Sahyog' (or Cooperation), he said. "The current edition of the IPRD has chosen an apt theme - 'Operationalising the Indo-Pacific Oceans Initiative', and I am convinced that the collective wisdom in the Dialogue will bring about practical and result-oriented options to take this transformative initiative forward. In doing so, I believe that we need to address three predominant and interlinked sectors, namely --- security, economy and environment," Admiral Kumar said.

Talking about the security environment in general, and maritime security in particular, he said while the possibility of a traditional inter-state conflict cannot be ruled out, there is an increased risk to the rules-based order emanating from disputes of jurisdiction, undermining of UNCLOS (United Nations Convention on the Law of the Sea), piracy and armed robbery, illegal human migration, drugs and arms trafficking, and illegal unreported and unregulated fishing. "Maritime terrorism and proliferation of advanced technologies have further complicated the security matrix. Inevitably, given its increased centrality in global affairs, the Region has witnessed increased presence of maritime security forces from a multitude of nations - regional as well as extra-regional," the Navy chief added.

The IPRD is an apex-level international annual conference of the Navy and the principal manifestation of the Navy's engagement at the strategic level. The National Maritime Foundation (NMF) is the Navy's knowledge partner and chief organiser of each edition of the event. He said the Indo-Pacific today represents a "strategic geography where most of us have found convergence in our interests and aspirations". However, in navigating the path together, there are numerous challenges that must be overcome. Admiral Kumar said these challenges could be viewed as a "trinity of '3 Is' - imperatives at home, influences from outside and some intrusive paradigms".

"These challenges are not unique to India, or for that matter any other nation in the region. We also recognise that these challenges cannot be overcome by one nation alone. Accordingly, the Indo-Pacific Region has witnessed formulation of numerous bilateral, multilateral and plurilateral mechanisms - most of which seek a safe, secure and stable Indo-Pacific. This common goal also brings possibilities to converge and collaborate. To this end, the Indo-Pacific Oceans Initiative (IPOI) provides an opportunity to synchronise, synergise and channelise our collective efforts," he said. "Speaking of the IPOI, to my mind, it represents the broadest framework conceptualised so far in the Indo-Pacific," the Navy chief said. It is guided by India's vision of the Indo-Pacific that is a "free, open, inclusive, peaceful and prosperous Region", and reflects India's civilisational ethos of pluralism, co-existence, openness and dialogue, he said.

Being a global open initiative, IPOI affords equal opportunity to every stakeholder and respects their sovereignty and freedom of choice. The IPOI is not aimed at creating new institutions, rather seeks to leverage existing mechanisms by drawing convergences and identifying areas of mutual interest, the Navy chief added.

<https://economictimes.indiatimes.com/news/defence/prosperous-indo-pacific-hinges-on-peaceful-maritime-domain-navy-chief/articleshow/95714997.cms?from=mdr>

## नवभारत टाइम्स

गुरुवार, 24 नवंबर 2022

### सेना के पास आने वाला है अचूक हथियार

भारतीय सेना अपनी मारक क्षमता बढ़ाने के लिए नई तकनीकों और नए हथियारों को तेजी से अपना रही है। इस कड़ी में आर्मी अब लॉइटरिंग एम्युनिशन (Loitering munition) भी खरीदा रही है। लॉइटरिंग एम्युनिशन यानी बारूद भरा ऐसा गोला जो कुछ वक्त तक हवा में रहते हुए दुश्मन पर नजर रखेगा। दुश्मन जैसे ही इसकी रेंज में आएगा, तो यह उसे उसे तबाह कर देगा। इसीलिए इसे आत्मघाती ड्रोन भी कहते हैं। सेना इमरजेंसी खरीद के तहत ऐसे लॉइटरिंग एम्युनिशन (Canister-Launched Anti Armour Loiter Munition) लेने वाली है। यह खरीद भारतीय कंपनियों से होगी और आर्मी ने इसके लिए कई कंपनियों से प्रोजेक्ट भी देने को कहा है। फिलहाल सेना 180 लॉइटर एम्युनिशन खरीदने वाली है। ये एंटी आर्मर होंगे यानी इनकी मदद से दुश्मन सैनिकों को ले जाने वाले वीइकल और टैंक भी ध्वस्त किए जा



सकेंगे। लॉइटरिंग एम्युनिशन (loitering munition) को हम अटैक ड्रोन से समझ सकते हैं। अटैक ड्रोन (attack drone) हवा में चक्कर लगाता हुआ टारगेट का इंतजार करता है और सही वक्त पर सटीक निशाना लगा उसे तबाह कर देता है।

लॉइटरिंग एम्युनिशन भी इसी तरह काम करते हैं। भारतीय कंपनियां भी इसी तरह के अटैक ड्रोन बनाने पर काम कर रही हैं। अटैक ड्रोन (kamikaze drone) टैंक को भी ध्वस्त कर सकता है। कुछ खास परिस्थितियों में मिसाइल की जगह अटैक ड्रोन का इस्तेमाल ज्यादा कारगर साबित होता है, क्योंकि इसका ऑपरेशन बीच में अबॉर्ट भी कर सकते हैं। जैसे कि अर्बन एरिया में कोई आतंकी है और वह कहीं अंदर छिपा है। वह कुछ देर के लिए बाहर निकलता है तो अटैक ड्रोन से उस पर हमला किया जा सकता है। अटैक ड्रोन भी लॉइटरिंग एम्युनिशन है यानी यह हवा में घूमता है और जैसे ही आतंकी बाहर दिखेगा तो उस पर अटैक किया जा सकता है।

भारतीय सेना (Indian army) को जो लॉइटरिंग एम्युनिशन चाहिए वह किसी कनिस्टर जैसे सिस्टम से लॉन्च किए जा सकते हैं। साथ ही, सेना के पास जो टी-72 और टी-90 टैंक (T-72 T-90 tank) हैं, लॉइटरिंग एम्युनिशन को उनमें फिट करके भी लॉन्च किया जा सकता है। इससे उस जगह भी दुश्मन के टैंक या गाड़ियों को निशाना बनाया जा सकता है, जो विजुअल रेंज में नहीं हैं यानी दिखाई नहीं दे रहे। इन लॉइटरिंग एम्युनिशन की रेंज 15 किलोमीटर होगी। निशाना सटीक लगे इसलिए यह कुछ देर टारगेट के ऊपर हवा में रहेगा। यह कम से कम 15 मिनट टारगेट के ऊपर घूम सकता है। लॉइटरिंग एम्युनिशन की खास बात यह भी होगी कि अगर कुछ गड़बड़ हो जाती है तो इसके मिशन को बीच में अबॉर्ट भी किया जा सकेगा और उसे रिकवर भी किया जा सकेगा ताकि वह दुश्मन के हाथ में न आए।

<https://navbharattimes.indiatimes.com/navbharatgold/breaking-news-in-hindi/indian-army-iaf-to-procure-hundreds-of-loitering-munitions/story/95720407.cms>



Wed, 23 Nov 2022

## Welding of Vikrant: All You Want to Know

By Dr AK Shah

There were a flurry of articles in the media on the first indigenous aircraft carrier of our country immediately prior to and post commissioning of INS Vikrant. She was popularly known as IAC (Indigenous Aircraft Carrier) till then. These articles touched upon the complexity of the ship, her features and capabilities, the indigenous content, the development of indigenous steel, the pontoon assisted launch and the implications on maritime security etc. There was also a mention of the employment opportunities during her construction. But there was only a passing reference to the welding technology that went into joining the steel plates to build the aircraft carrier that it

actually is today. Developing the welding process indigenously was a challenge in itself. A word about these challenges will bring out the intricacies in building the steel hull of a ship using indigenous steels.

India began work on IAC sometime in 2002 with a lot of challenges to be overcome to realise the dream of make in India. Prior to this, many Indian Naval ships were either imported or built using imported steel and weld consumables (welding electrodes, flux etc). The Indian Navy tried many times to go in for indigenous development of these but small volumes prevented them from doing so. Construction of IAC provided a big opportunity to push for indigenisation as it was being designed to be a large ship which would require large volumes of steel and weld consumables. The Navy took up the challenge and got the first indigenous shipbuilding steel DMR249A manufactured in India in association with Defence Metallurgical Research Laboratory (DMRL) of Defence Research and Development Organisation (DRDO) and Steel Authority of India Limited (SAIL). Another challenge was to find a shipyard that had a dry-dock which could accommodate and launch such a large ship. No shipyard out of the Defence Public Sector Undertakings (DPSUs) was capable of handling such a big ship. So Cochin Shipyard Ltd (CSL) which was constructing merchant ships only till then was contracted as it had the dry-dock of the requisite size to handle IAC.

In the meantime, the successful development of the shipbuilding steel at SAIL encouraged the Navy to review their policy on usage of steels for constructing all future naval ships in order to reduce a large inventory of steels for different classes of ships. Thus to put an end to its legacy of using numerous types of steels, the Navy decided to use DMR249A only for all Naval ships to be built in Indian shipyards. However, the Navy soon realised that though the steel would be ready, the variety of weld consumables required to construct the ship may not be available in adequate quantity as only one manufacturer, Mishra Dhatu Nigam Ltd (MIDHANI), was producing them that too based on imported technology. The Navy then tasked another laboratory of DRDO, Naval Materials Research Laboratory (NMRL) to develop the weld consumables and the appropriate weld technology for the indigenous shipbuilding steels.

The design and development of weld consumables and its welding technology is complicated with many constraints as compared to steel development. The conflicting properties of high strength and toughness are achieved in the steel by optimising its chemical composition, mechanical deformation during forging and rolling the steel in the form of plates and subsequent optimisation of its properties by heat treatment i.e. controlled heating and cooling cycles. In the case of weld consumables you achieve the properties by optimising the composition and limited localised control on the heating and cooling cycles after the solidification of deposited metal. The important step of mechanical deformation in steel making is not available. The limited control over the heating and cooling cycles is achieved by employing the appropriate welding technology. The welding process also alters the properties of the steel which is adjacent to the weld joint and it is termed as Heat Affected Zone (HAZ). Even the optimisation of the weld deposit composition is constrained due to the problem of galvanic corrosion in seawater, if the composition is grossly different from the steel plate. As the majority of the welding is done manually by welders, the variability of human skill becomes an issue especially when the welding is to be done in vertical or overhead positions. The use of proper welding technology, therefore, becomes critical to achieve a narrow band of tolerances for the final properties of the joint while encompassing all these constraints. This is achieved by optimising heat input during welding by controlling the welding variables within the narrow band.



The task involved development of different weld consumables for various welding processes such as, Manual Metal Arc Welding (MMAW), Gas Metal Arc Welding (GMAW), Flux Cored Arc Welding (FCAW) and Submerged Arc Welding (SAW) and their welding technology. The challenge was to develop multiple vendors in a very short time to meet the high demand. Another challenge was adaptation of the technology on the shop-floor of the shipyard. The defence shipyards (DPSUs) were used to welding other high strength high toughness steels of similar kind. But, CSL was not used to the controlled heat input welding required for this grade of steel. They built ships using mild steel welding where the only criterion was high productivity. However, they adapted to the challenge very fast.

The Indian weld consumables industry also rose to the occasion and took up the challenge with utmost dedication and undying enthusiasm. Employing concurrent engineering methodologies, the challenges of laboratory development, shipyard evaluation, WPS (Welding Procedure Specification) / PQR (Procedure Qualification Record) development and delivery to the shipyard after due approval of the procedures was achieved in a short duration of two years. The spin-offs from construction of INS Vikrant have been many. The Indian industry has been exposed to new technologies, thus giving a fillip to the Make in India programme.

<https://www.financialexpress.com/defence/welding-of-vikrant-all-you-want-to-know/2887470/>



*Wed, 23 Nov 2022*

## **French Minister Lecornu to Board INS Vikrant on November 27 off Mumbai**

French Defence Minister Sebastien Lecornu will go onboard aircraft carrier INS Vikrant off the coast of Mumbai on November 27 even as the last of the contracted 36 Rafale fighter will land at Jamnagar air base in India from France on December 13 with the help of UAE mid-air refueler. Minister Lecornu will be on a two day visit to intensify bilateral defence ties and is scheduled to meet his Indian counterpart Rajnath Singh on November 28 for talks and is expected to call on Prime Minister Narendra Modi. However, his on-board visit to INS Vikrant, the indigenous aircraft carrier, which was commissioned by PM Modi on September 2, 2022, is significant as French Rafale-M is one of the two contenders for the floating airfield. The other contender for the 26 maritime strike fighters for INS Vikrant is US Boeing manufactured F-18 fighter.

India's other aircraft carrier INS Vikramaditya is expected to come out of major overhaul by next month with scheduled sea trials and aircraft landings planned off the coast of Karwar immediately after. While Minister Lecornu went out of his way and protocol to attend the kindling ceremony at Arc de Triomphe in Paris with visiting Army Chief General Manoj Pande on November 16, the French Defence Minister has been directed by President Macron to extend all defence cooperation to PM Modi's "Aatmanirbhar Bharat" campaign. PM Modi and President Macron had a bilateral meeting on the sidelines of the recently concluded G-20 summit with both countries prepared to join hands from seabed to space. President Macron's diplomatic advisor Emmanuel Bonne is expected to be in India in January 2023 for the strategic dialogue with National Security Advisor Ajit Doval.

In between the visits of Minister Lecornu and Diplomatic Advisor Bonne, France will be dispatch the last of the Rafale fighter jet to India on December 13. The fighter will be refueled by UAE's Airbus 330 refueler over Indian Ocean. Although this fighter (sign RB 001) was the first one built by Dassault under the 36 aircraft contract, the aircraft was re-fitted with the new engines and parts as it had been extensively used by the IAF to train its pilots on Rafale fighters in France. This aircraft is fitted with all India specific enhancements and will join the Rafale squadrons based in Ambala in Haryana and Hashimara in West Bengal. With this the French Dassault will complete the deliveries of all the 36 fighters for India. India and France have deep defence ties for the past decades with the latter now willing to jointly design, develop and manufacture aircraft engines and long range attack submarines in India for strengthening its defence as well as allowing it to export to third friendly countries.

<https://www.hindustantimes.com/india-news/french-minister-lecornu-to-board-ins-vikrant-on-november-27-off-mumbai-101669140202829.html>



*Tue, 22 Nov 2022*

## **Pakistan ‘Shows Off’ its Indigenous Shahpar-2 Combat UAV that can ‘See, Surround & Smash’ Enemy Targets**

*By Tanmay Kadam*

The arms exhibition was held at the southern port city of Karachi between November 15-18. It showcased some of the advancements made by Pakistan's defense industry in unmanned combat aerial vehicles (UCAVs) that play an increasingly important role in warfare, as demonstrated in the ongoing Ukraine war. Pakistan became aware of the role of combat drones in 21st-century warfare for the first time when American drones began conducting strikes against terror outfits in Afghanistan and border areas of Pakistan. Soon, Pakistan started the development of drones for surveillance and attack purposes and went on to become the fourth country in the world after the US, UK & Israel to have successfully deployed a UCAV in an active operation in 2015 that eliminated three high-profile Tehrik-i-Taliban Pakistan (TTP) terrorists in North Waziristan's Shawal Valley.

### **Shahpar-2 UCAV**

The Shahpar-2 Medium Altitude Long Endurance (MALE) drone produced by Global Industrial and Defense Solutions (GIDS), a Pakistani state-owned defense conglomerate and the country's largest defense manufacturer, was showcased at IDEAS 2022. The Shahpar-2 is an improvement on the Shahpar-1 drone commissioned into the Pakistan Army and Air Force in November 2013 for intelligence, surveillance, and reconnaissance (ISR) missions and assistance in disaster management. The Shahpur-2 is attack-capable and can fly up to 1000 kilometers to hit its target. It locks onto its target with a laser and then strikes it with a missile.

The drone can fly at a maximum speed of around 222 kilometers per hour (kph). Its take-off speed ranges roughly between 148 to 158 kph, similar to its cruising speed. Its maximum range is around 1,050 kilometers, and the data link range is 300 kilometers. The Shahpur-2 can restart

its engine during flight and contact satellites in any campaign, day or night. The drone has already entered service with Pakistan's Army, Navy, and Air Force, and it was publicly displayed for the first time during the Pakistan Day parade on March 23, 2021. Asad Kamal, CEO of GIDS, told BBC that the government told him that the technologies for which Pakistan depends on foreign countries should be gradually developed in the country.

“After that, we started working on our next plan. Our Army needed a system that could not only see the target but surround it; if required, it could also destroy it. After that, we researched and worked on the Shahpar-2 drone,” said Kamal. “When you assemble a technology or acquire it from another country, and after a few days that country stops giving you the technology, your product remains incomplete, and you cannot use it yourself. Nor can it be recovered, so the basic technology of this drone has been made in Pakistan itself,” Kamal said.

### **Ababeel Series Drones**

Apart from GIDS' Shahpur, Pakistan's Ordnance Factory had also indigenously made a surveillance drone named 'Ababeel.' The attack variants of the drone have also been developed and were exhibited at this year's IDEAS. One of the variants presented at the exhibition was the MR-5 drone which can be armed with two mortar shells, one with 16 millimeters and the other 18 millimeters in diameter. It can fly at a range of 30 kilometers at 45 kilometers per hour and stays airborne for one and a half hours. Another variant was the Ababeel V-5 which has the vertical take-off and landing (VTOL) ability. It is a high-speed drone that can fly at 120 kilometers per hour and stay in the air for 2-3 hours. Its combat payload carrying capacity is five kilograms.

Also put on display was the MR-10 drone with a combat payload capacity of 10 kilograms and a range of 30 kilometers. It can fly up to an altitude of 3,000 meters. Riyaz Ahmed, head of the drone unit at the Pakistan Ordnance Factory, told the BBC that all the Ababeel series drones could operate day and night.

### **Pakistan Aims To Export Its Combat Drones**

In addition to accomplishing self-sufficiency in developing and producing combat drones, Pakistan also aims to export them to other countries. Before IDEAS 2022, GIDS' Shahpar-2 was also presented at the Egypt Defense Expo (EDEX) 2021, held in November last year. According to Kamal, GIDS has exported its products made in Pakistan to more than 16 countries, including Bangladesh, Sri Lanka, countries of Central Asia, Malaysia, Algeria in Africa, Congo, Peru, etc. While Pakistan Ordnance Factory said their Ababeel series drones would soon enter service with Pakistan Army, foreign delegations also showed some interest during the exhibition. So far, the Pakistan Ordnance Factory has sold weapons worth more than USD 30 million to more than forty countries, according to its spokesperson, Salman Khan.

<https://eurasianimes.com/pakistans-indigenous-shahpar-2-combat-uav-ready/?amp>

## **China's Militarisation and Weaponisation of Space**

The article has been authored by Subramanyam Sridharan, distinguished member, Chennai Centre for China Studies (C3S). Space has been weaponised for a long time now by all space-faring nations. Space weaponisation refers to using weapons at, to or from space. Space militarisation refers to using space-based assets for military purposes such as for spying or communication by the militaries. The space weapons race well and truly started between the United States (US) and the erstwhile Soviet Union in the 1950s, as soon as the first satellite, Sputnik-1, was placed in orbit. A stunned world, just recovering from the devastating World War II was averse to another threat to peace. Thus, was born the United Nations' Outer Space Treaty (OST) in c. 1967. The Fourth Article of the OST specifically bans placing Weapons of Mass Destruction in space and/or celestial bodies. However, it is silent on conventional weapons, and it is this loophole that is being exploited today in weaponizing space. Later agreements like the Moon Treaty or Prevention of an Arms Race in Outer Space (PAROS) are also either silent or have not found wide acceptance. The Sino-Russian proposal of Prevention of Placement of Weapons in Outer Space and Threat (PPWT), the European Space Agency's 'Code', as well as the latest US effort, the Artemis Accords, have not progressed much either. China is in a race not only to catch up but also be in a position to set future standards.

The origins of China's space programme go back to the second artillery regiment of the People's Liberation Army (PLA), now known as the Rocket Forces (PLARF). The space programme was started under it in the 1950s. This is unlike the Indian scenario where civilian (ISRO), and military (DRDO) space activities have been managed entirely separately. The Long-March 1 (LM-1/CZ-1) and LM-2 LEO (Low Earth Orbit) satellite launch vehicles were modified versions of their Dong Feng 3 IRBM (Intermediate Range Ballistic Missile) and the DF-5 ICBM.

The space programme of China is deeply embedded into its national objective. Apart from prosperity (or the Chinese dream, fuqiang), the Chinese national objective also emphasises 'war-fighting and winning.' Space increasingly plays a pivotal role in its national security strategy. In China's assessment, the overwhelming space capabilities of the US gives it an undue advantage and that needs to be neutralised before it can re-take lost territories within the First Island Chain and dominate the Second Island Chain and beyond into the Pacific. China also sees space as another area where it must establish its presence and eclipse the US in an all-out competition. The third most important aspect is the exploitation of space resources. All these are to be achieved before the 2049 deadline set by Xi Jinping for the fuqiang. The establishment in 2015 of the Strategic Support Force (PLASSF) as an independent branch of the PLA has given an impetus to space warfare to fight what China calls 'informatised' wars of the future.

It was at the turn of the new millennium that China began to take space very seriously after closely studying the US tactics in Operation Desert Storm. The first task that the Chinese weaponisation project undertook was developing Anti-SATellite (ASAT) weapons in order to disable the preponderant number of US satellites. China conducted cold tests for a Direct Ascent ASAT weapon, Dong Neng-1, which was a modified version of its SC-19 Anti-Ballistic Missile (ABM), in c. 2005 and 2006 and a real test in 2007 hitting a defunct Chinese weather satellite.

An upgraded Dong Neng-2 was tested in 2013 for a non-destructive test of a geostationary satellite. DN-2 is expected to be already operational.

China has also been developing ‘parasitic microsattellites’ which can be released from another satellite in orbit which can then smash into other on-orbit satellites. At such high speeds even a 10 Cm. debris can destroy a satellite, as it happened to our RISAT-1 in c. 2016. Weighing only a few Kilograms, these are relatively inexpensive but effective alternative to ground-based ASAT weapons. They can be built with intelligence to accurately recognise and then destroy an enemy satellite. Another class of highly effective space weapons, but ground-based, being developed by China is the Directed Energy Weapons (DEWs) or lasers. DEWs direct concentrated electromagnetic energy from earth to the satellites affecting their operations, especially their earth-observation sensors. There can also be space-based DEWs. The DEWs can dazzle (that is, temporarily disable), blind (more permanently damage sensors) or even destroy a space asset.

Within a year, China is likely to have space-based chemical laser weapons. Such co-orbital lasers have several advantages to ground-based DEWs as they require far less power and can be far more accurate. China is also working on space-based microwave jammers that would interfere with communication payloads of enemy satellites, and chemical sprays that could damage sensors or solar panels thereby making satellites inoperative. China claims that it has developed a powerful Klystron Amplifier, which generates high-power microwaves, that can be used in co-orbital payloads to jam signals of an adversary’s satellites.

In August 2021, China tested a new class of space-based weapons, the hypersonic Fractional Orbit Bombardment System (FOBS). The FOBS was developed by the Soviet Union in the 1960s to penetrate the Ballistic Missile Early Warning Systems (BMEWS) of the US at their weakest point. The US, for its own reasons, did not overblow the threat then and it faded away by the 1980s, although the FOBS appeared to be in violation of the then nascent OST. Though the August 2021 test by the Chinese missed the target by some margin, a similar test conducted earlier this year was successful. The FOBS weapon hardly gives a few minutes of window for ABMs to react, unlike in the case of traditional ICBMs.

China’s rapid technological growth in space-related activities poses another problem, namely dual-use of technologies. Rendezvous and Proximity Operations (RPO) are techniques that are used for docking (which is needed, for example, to transfer replacement crew and supplies to International Space Station, ISS), cost-effective satellite refueling (to extend the life of in-operation satellites that have run out of fuel for station-keeping activities), and space debris removal. However, the same technology can also be used to inspect and gather intelligence about enemy space assets, or for co-orbital anti-satellite capability. Robotic arms can be used for mission extension of low-fuel satellites as Intelsat demonstrated in c. 2020 or space debris removal as China’s ShiJian-21 (Roaming Dragon, SJ-21) satellite demonstrated in January 2022 when it grabbed a defunct BeiDou navigation satellite in Geostationary Earth Orbit and placed it in a graveyard orbit far above, thus acting as a ‘space tug’. While this is a useful space-debris cleaning exercise for non-cooperative targets, this can also be employed for offensive space purposes against other nations’ satellites. This makes Space Situational Awareness (SSA) increasingly imperative for major space-faring nations like India to protect their space assets.

The PLASSF is also tasked with conducting electronic warfare (EW) which involves acquiring or interfering with an adversary’s electronic transmission. It comprises of ELINT (Electronic Intelligence) and COMINT/SIGINT (Communication/Signal Intelligence). In its broad scope, the



former involves mapping all emissions of electromagnetic energy from enemy land or aircraft carrier or airborne early-warning systems. SIGINT involves capturing electronic communication occurring among various entities of the enemy. Some of the TJS-series (Tongxin Jishu Shiyan) of Chinese satellites are ELINT satellites located in GEO while some others are early-warning systems which can detect missile launches with their Infra-red (IR) seekers.

China also operates other types of intelligence-gathering satellites. The Yaogan satellites, also known by their military nomenclature Jianbing, are a large number of assorted satellites which employ synthetic aperture radars (SARs), and electro-optical (EO) sensors. The SAR Yaogan usually operate in polar orbits and provide better than one metre resolution. The Yaogan-30 Ocean Surveillance Satellites are launched in triplets in close proximity to each other to locate Carrier Battle Groups (CBGs) through signal intelligence and triangulation. These satellites, cue the ground-launched DF-21D/DF-26B missiles and ship-launched YJ-21 anti-ship ballistic missiles (AShBM) to their target, and are their backbone to implementing the Area Denial/Access Denial (A2/D2) in the First and Second Island Chains. It is believed that China will eventually operate 18 triplets of these important satellites, which would provide a constant surveillance of the Pacific and the Indo-China Sea in order to defeat the American Nuclear Aircraft Carriers (CVNs). China has followed the two space superpowers, the US and Russia, in developing its space assets and weapon technologies. What add to the nervousness about the Chinese space developments are its opaque nature and its hegemonic ambitions based on millennia-old Middle Kingdom belief system. As an irredentist China's neighbour with which we have fought militarily, we have to beware of its space weapon capabilities so that we can defend ourselves. Our 2017 ASAT test came as a result of this assessment. It is well past time for our Defence Space Agency (DSA) to develop offensive space capabilities.

<https://www.hindustantimes.com/ht-insight/international-affairs/chinas-militarisation-and-weaponisation-of-space-101669187458960.html>



*Wed, 23 Nov 2022*

## **NATO Allies Test Air Defence System in Romania with Simulated Attack**

NATO allies on Wednesday conducted a military exercise to test air and missile defences in Romania, about a week after a stray missile crashed in Poland and cast a spotlight on gaps in the alliance's shield for the skies. A French air defence system deployed to Romania repelled a simulated attack by allied fighter jets, NATO's Allied Air Command in Ramstein in western Germany said. Turkish F-16 fighter jets, Spanish Eurofighters, U.S. growler aircraft designed for electronic warfare and French Rafale jets flying from the aircraft carrier Charles de Gaulle participated in the exercise, it added. "In response to Russia's war against Ukraine, we continue strengthening our deterrence and defences in the eastern part of the alliance," NATO spokesperson Oana Lungescu said.

She said the alliance had added more fighter jets and surveillance aircraft on patrol, along with more ground-based air defences and air-defence-capable ships at sea. "Exercises such as this one ensure that NATO forces are able to operate together and remain ready to respond to any threat

from any direction," she noted. France has deployed its SAMP/T air defence system to Romania since May. It is designed to protect battlefields and sensitive sites such as airports and harbours against cruise missiles, aircraft, drones and tactical ballistic missiles. Several other allies have also moved such weapons to NATO's eastern flank following Russia's invasion of Ukraine: German Patriot fire units are deployed to Slovakia, the United States is operating Patriots in Poland, and Spain sent NASAMS systems to Latvia.

However, the crash of what appears to have been a stray Ukrainian air defence missile in Poland Tuesday last week cast a spotlight on the need for NATO to plug more gaps in its air shield. After the Cold War, many NATO allies scaled down the number of units focussed on threats from the sky, reflecting the assessment that going forward they would only have to deal with a limited missile threat coming from countries such as Iran. This perception changed drastically with the Russian invasion, which sent NATO allies scrambling to increase stocks of ammunition and tackle air defence shortfalls.

<https://www.reuters.com/world/europe/nato-allies-test-air-defence-system-romania-with-simulated-attack-2022-11-23/>

## THE ECONOMIC TIMES

Wed, 23 Nov 2022

### **UK to Send Helicopters to Ukraine for 'First' Time**

Britain is to send helicopters to Ukraine for the first time since Russia's invasion, the defence ministry in London said on Wednesday. Ten crews of Ukrainian service personnel and engineers underwent a six-week training programme in the UK, as part of the "first helicopter capability the UK has donated to Ukraine", the ministry said. In addition to the three former British military Sea King helicopters, the first of which has already arrived, the UK will also supply an additional 10,000 artillery rounds. "Our support for Ukraine is unwavering. These additional artillery rounds will help Ukraine to secure the land it has reclaimed from Russia in recent weeks," Defence Secretary Ben Wallace said. British Prime Minister Rishi Sunak used a weekend visit to the Ukrainian capital to set out a new £50 million (\$59 million) package of defence aid which included 125 anti-aircraft guns and equipment to counter Iranian-supplied drones. Britain is also supplying cold-weather winter kit to the Ukrainian armed forces.

Ukrainian troops face plummeting temperatures as they battle through the winter to eject Russian forces from occupied Ukrainian territory. The announcement came as Wallace visited Norway for a meeting of the Northern Group of defence ministers onboard the UK's aircraft carrier HMS Queen Elizabeth. The 12-strong Northern Group is a UK initiative aimed at promoting defence and security cooperation in northern Europe. Other members are Denmark, Estonia, Finland, Germany, Iceland, Latvia, Lithuania, the Netherlands, Norway, Poland and Sweden. Former premier Boris Johnson was a staunch ally of Ukraine, visiting Kyiv three times and funnelling military hardware, funding and training resources to the country.

<https://economictimes.indiatimes.com/news/defence/uk-to-send-helicopters-to-ukraine-for-first-time/articleshow/95718658.cms?from=mdr>



*Wed, 23 Nov 2022*

## **UK to Give Artillery Rounds and Helicopters as Part of Military Aid to Ukraine**

An additional 10,000 artillery rounds will be provided by the UK to help Ukraine defend itself against Russia's illegal invasion, the Defence Secretary has announced on a visit to Norway. The rounds will enhance Ukraine's defensive capability and come as the first delivery of Sea King helicopters arrives in Ukraine to provide key search and rescue capabilities. The Royal Navy provided a six-week programme of Sea King training in the UK for 10 crews of the Armed Forces of Ukraine and associated engineers. The additional military aid comes after Prime Minister Rishi Sunak visited Kyiv at the weekend, where he announced a £50 million package of defence aid. That package included 125 anti-aircraft guns and technology to counter deadly Iranian-supplied drones, including dozens of radars and anti-drone electronic warfare capability.

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

Our Support for Ukraine is unwavering. These additional artillery rounds will help Ukraine to secure the land it has reclaimed from Russia in recent weeks. The Defence Secretary is visiting Norway where he will host a meeting of the Northern Group of defence ministers onboard the UK's aircraft carrier HMS Queen Elizabeth. The meeting is expected to cover the implications of Russia's illegal invasion of Ukraine, security developments in Northern Europe, and Sweden and Finland's NATO membership applications.

The Northern Group is a UK initiative which aims to promote more coherent, efficient and effective defence and security co-operation in northern Europe. It comprises 12 nations; Denmark, Estonia, Finland, Germany, Iceland, Latvia, Lithuania, the Netherlands, Norway, Poland, Sweden and the UK. The UK is also supplying winter kit to Ukraine's troops as they continue to battle to liberate their country from Russian forces as winter rapidly approaches - when temperatures are known to sink to minus 20°C and below in parts of the country. Heavy duty sleeping bags and roll mats, combined with heated accommodation and personal winter clothing, will help to prevent cold-related injuries and ensure troops can operate effectively and efficiently.

<https://www.gov.uk/government/news/uk-to-give-artillery-rounds-and-helicopters-to-help-defend-ukraine>

Wed, 23 Nov 2022

## Royal Navy Ships to be Fitted with Advanced New Missile System

Royal Navy frigates and destroyers will get a significant boost to their long-range precision strike capabilities following a new partnership between the UK and key NATO and Joint Expeditionary Force (JEF) ally, Norway. Strengthening defence ties between the UK and Norway, the Royal Navy will receive the Naval Strike Missile (NSM), outfitted on a total of eleven Type 23 frigates and Type 45 destroyers, in a collaboration with the Norwegian government. Measuring nearly 4 metres long, the NSMs are a fifth-generation missile using integrated sensors and autonomous target recognition to precisely strike enemy ships and targets on land at distances of more than 100 nautical miles (115 miles) at high subsonic speeds. It can elude enemy radar and defence systems by flying at sea-skimming altitude and using evasive manoeuvres..

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

We have a long history of defence cooperation with Norway. This new agreement cements our partnership with one of our closest allies, whilst strengthening our Royal Navy with a new surface to surface strike capability. Replacing the Harpoon surface-to-surface weapon, due to go out of service in 2023, the world-class anti-ship missile will be fitted to three vessels at pace and will be ready for operations onboard the first Royal Navy vessel in a little over 12 months. The collaboration will result in more ships equipped with the highly sophisticated naval strike missiles which in turn will contribute in enhancing the security in our common areas of interest. The missile system will be integrated in UK Dockyards through Babcock and BAE with Norwegian support, the missile system is manufactured by Kongsberg Defence Aerospace. NSM will enhance collaboration and interoperability with several of our key strategic partners. In the North Atlantic and Baltic Sea Region users, and soon to be users, include Norway, the US, Poland, Germany, and Canada.

### **Norwegian Minister of Defence Bjørn Arild Gram, said:**

This is a significant task with an ambitious timeline. Both nations have established a designated team with a strong mandate to ensure the success of this common effort. The Norwegian company Kongsberg Defence & Aerospace is supporting the joint team with their expertise and the planned integration on the UK vessels. The meeting of Northern Group Defence Ministers on HMS Queen Elizabeth, will see discussions on the implications of Russia's illegal invasion of Ukraine, security developments in Northern Europe, and Sweden and Finland's NATO membership applications. The Northern Group is a UK initiative which aims to promote more coherent, efficient and effective defence and security co-operation in northern Europe. It comprises 12 nations; Denmark, Estonia, Finland, Germany, Iceland, Latvia, Lithuania, the Netherlands, Norway, Poland, Sweden and the UK.

<https://www.gov.uk/government/news/royal-navy-ships-to-be-fitted-with-advanced-new-missile-system>

Wed, 23 Nov 2022

## USMC Tests New Light Marine Air-Defence Integrated System

The US Marine Corps (USMC) has tested a new ground-based air-defence (GBAD) capability, called Light Marine Air-Defence Integrated System (LMADIS). The test was executed by Marines assigned under 2nd Low Altitude Air Defence (LAAD) Battalion. It was carried out from the Marine Corps Outlying Landing Field Atlantic in North Carolina, US. According to the USMC, the use of commercial off-the-shelf drones in battlespace and offensive warfare has increased over the years and the new system is being tested to upgrade the service's existing GBAD capabilities. USMC 2nd LAAD gunner staff sergeant Dustin Yonkings said: "With constant evolving of commercial drones, one thing that won't change is required frequencies used to pilot any drone."

The new LMADIS capability is designed to defeat and neutralise enemy's uncrewed aircraft systems (UAS). It minimises airborne threats by disrupting available electronic signals between the UAS and its operator. The system leverages electronic weapons equipped on a compact and light frame, such as Polaris-developed MRZR multi-configurable off-road vehicle, which allows deployment of LMADIS to austere environments using air transport support. The USMC informed that the new system uses a total of two MRZR's, housing CM262U optic, RPS-42 radar and Skyview MP system and the Modi II dismountable electronic-warfare system, used to disrupt enemy drones and communications. The CM262U is used as the system's 'eyes', while the radar system is equipped to provide 360-degree air surveillance and long-range drone detection. The system is also supported by an AN/PRC-158 manpack radio system, that allows LMADIS to transfer detected threats' information to the troops in its immediate proximity and to commanders in rear echelon. The latest effort is part of USMC's Force Design 2030 modernisation initiative.

<https://www.naval-technology.com/news/usmc-tests-air-defence-system/>



Wed, 23 Nov 2022

## Opportunities in Chaos: South Korea Emerges as a Major Defence Supplier

*KV Ramesh*

The ongoing Ukraine war and the uncertain global security situation have given a boost to defence production industries and weapon suppliers worldwide. With order books full, defence-related factories all over the world are working overtime.

## **The business of war**

According to SIPRI, in 2021 defence spending by countries across the world crossed \$2 trillion for the first time, touching \$2.1 billion. The current year, with conflict in Europe raging, could see a steep rise, with many anticipating it to cross \$3 trillion.

Home » Opinion / Analysis » Opportunities In Chaos: South... Opportunities in chaos: South Korea emerges as a major defence supplier KV Ramesh Updated On: 23 Nov 2022 6:50 PM South Korea's self-propelled K9 howitzer. (Photo credit: AFP via Getty) Building on its reputation as an automobile major, South Korea is now diversifying into becoming a major defence equipment supplier The story The ongoing Ukraine war and the uncertain global security situation have given a boost to defence production industries and weapon suppliers worldwide. With order books full, defence-related factories all over the world are working overtime. The business of war According to SIPRI, in 2021 defence spending by countries across the world crossed \$2 trillion for the first time, touching \$2.1 billion. The current year, with conflict in Europe raging, could see a steep rise, with many anticipating it to cross \$3 trillion. Also Read - Listen: Why Supreme Court is concerned over CECs' truncated tenure Militaries across the world are studying and absorbing lessons from the Ukraine conflict, like the vulnerabilities of tanks, and the offensive potential of kamikaze drones, among other learnings. That means designing and producing more effective armour for tanks, more lethal suicide drones and high-energy rockets and shells that knock out entire electricity systems in urban settings, weakening the enemy's resolve.

More importantly, the supply of arms and ammunition from the stockpiles of US and NATO countries to Ukraine has required the replenishing of arsenals. No wonder arms suppliers are grinning from ear to ear. The US defence budget was \$782 billion last year, and this year the Biden administration is seeking \$813 billion. The US allies are not far behind. In the first flush of the Ukraine war, Germany announced a one-time \$100 billion investment in arms, with the defence budget increasing by two per cent annually. All this is sweet news for defence industries and arms dealers. Arms-producing countries are upgrading production lines, and churning out more advanced weapons systems than ever before. Countries that are not traditional producers of weapons, and had a policy of not exporting lethal weapons to others, like India, are now rubbing their hands at the bonanza available. Last year alone, Indian defence exports were \$2 billion and are set to rise even further this year.

### **Seoul's stratospheric rise as a defence manufacturer**

South Korea, known mainly for its electronics and automobiles, has now scented blood and has entered the game. The country has long been producing defence hardware, mainly electronics and even warships and submarines. Of late it has been aggressively marketing its wares, including its K2 Black Panther main battle tanks and its K9 howitzer systems. Technological sophistication, strict delivery schedules and price advantage are the South Korean defence industries' strengths. South Korea has found Poland as a major customer, and the first batch of 10 of the 182 Black Panthers was delivered last month.

The rest are scheduled to be delivered by 2025. Poland also received the first batch of 29 K9 howitzer systems produced by Hanwha industries, with 183 more in the pipeline. The entire deal with South Korean firms is likely to cost Poland \$5.58 billion. What is interesting is that Korea won the deal in the face of competition from KMW (Krauss-Maffei Wegmann), the producer of the famed Leopard tanks and infantry fighting vehicle Puma. Also in the pipeline to Warsaw are

48 FA-50 light combat aircraft from Korea Aerospace Industries. India, seeking to diversify its defence purchases away from its traditional supplier Russia, is yet another customer in recent years.

India has already bought 100 K9 howitzers, renamed Vajras, co-produced by Hanwha and India's L&T and is set to buy 200 hundred more, after the army deployed them in the Ladakh sector in the post-Galwan period, and found them to be effective. The mobile howitzer has impressive quick response firepower, able to fire on the move, and is able to quickly relocate after firing to avoid enemy retaliation. India and South Korea are also likely to enter joint production of defence hardware for export, including warships. South Korea's defence-related exports doubled in 2021 to \$7 billion, according to the Export-Import Bank of Korea, and are expected to cross the \$10 billion mark this year. South Korean firms have pulled off major deals with other countries too. Hanwha has also signed contracts with Australia to supply 30 K9 Thunder howitzer systems, and LIG Nex1 has concluded a multi-billion deal with UAE for the supply of M-SAM surface-to-air missile systems. One of South Korea's secrets of success in becoming the eighth largest defence exporter has been its strength in advanced electronics and production lines, the synergy between sub-system producers, a keen insight into the geopolitical environment, with the ability to customize the wares for the needs of the customer. With their own 'Make in India' dreams, Indian defence firms in the private sector could learn much from the South Korean example.

<https://www.news9live.com/opinion-blogs/listen-why-supreme-court-is-concerned-over-cecs-truncated-tenure-209680?infinitescroll=1>

## THE ECONOMIC TIMES

Wed, 23 Nov 2022

### **US and Israel Agree to Accelerate Operational Plans Against Iran: IDF Lieutenant General**

Israel and the US have agreed that they are at a "critical point" in time that requires the acceleration of operational plans and cooperation against Iran and its terrorist proxies, Israel Defence Forces (IDF) have said as its chief held discussions with senior American officials in Washington. Chief of Staff of the IDF Lieutenant General Aviv Kohav landed in the US on Sunday for five days of meetings with senior officials focused on the Iranian threat, the IDF said. The Israeli Army's Chief on Monday met with the Chairman of the US Joint Chiefs of Staff, Mark Milley, US National Security Adviser, Jake Sullivan, and CIA Director, William Burns. "During the discussions, it was agreed that we are at a critical point in time that requires the acceleration of operational plans and cooperation against Iran and its terrorist proxies in the region," the IDF quoted Kohavi as saying in Tweets posted on its social media handle on Tuesday.

"On the one hand, Iran is under many economic, military, and internal pressures, and on the other hand, it continues to promote its nuclear programme. The IDF strongly promotes all operational plans against the Iranian threat," Kohavi said. Israel has declared Iran's nuclear programme an existential threat vowing to foil it using "all options on the table", hinting at a possible military strike if required. Israel has consistently opposed US President Joe Biden's

attempts to revive the nuclear agreement between Iran and world powers that traded sanctions reliefs for curbs on the Islamic Republic's nuclear programme. The Joint Comprehensive Plan of Action (JCPOA), commonly referred to as the Iran nuclear deal, was reached in Vienna on 14 July 2015 between Tehran and the P5+1 (the five permanent members of UNSC + Germany) together with the European Union.

The US later withdrew from it in 2018 with then US President Donald Trump promising to negotiate a better deal. Iran has said that it had begun producing uranium enriched to 60 per cent, a level it never reached before, which is considered by experts as just a technical step away from the 90 per cent enrichment necessary to produce a nuclear weapon. The International Atomic Energy Agency confirmed the move and said Tuesday that its chief, Rafael Grossi, had reported the development to its member states. The US expressed "deep concern" Tuesday over the announcement, which was also condemned by Germany, France and the UK.

Meanwhile, the head of Israeli Military Intelligence, Major General Aharon Haliva, at a conference organised by the Institute for National Security Studies (INSS) in Tel Aviv on Monday said that Tehran has made "significant progress" toward producing ninety per cent enriched uranium. "The moment is coming when the greatest test of the international community will come to light when Iran entertains enrichment at 90 per cent, even if only symbolically," Haliva said. "I wonder what the international community will do when Iran starts enrichment at 90 per cent," he said. Haliva said that Israel Defence Forces (IDF) Chief of Staff Aviv Kohavi's ongoing trip to the US, which is focused on the Iranian threat, comes at a "critical" time.

The Military Intelligence Chief expressed hopes that if Israel were to strike Iran's nuclear facilities to foil its nuclear ambitions, he would like to see a US partnership. "I would be happy if the US was by our side," he emphasised. The day-long conference on, "Iran, Israel, and the Shia Axis: 2023 - A year of Conflict, had a high-profile participation, including former Defence Minister Moshe Ya'alon, Former Israeli NSA Meir Ben-Shabbat, Maj. Gen (retd) Amos Yadlin and former and serving diplomats. There was a near consensus among Israeli participants that the Iranian nuclear programme has reached the "threshold" point and that the Jewish state should try and persuade the US to be on its side if a military option was to be exercised.

<https://economictimes.indiatimes.com/news/defence/us-and-israel-agree-to-accelerate-operational-plans-against-iran-idf-lieutenant-general/articleshow/95719443.cms?from=mdr>

**DefenseNews**

*Wed, 23 Nov 2022*

## **US to Send Anti-Drone Machine Guns, Air Defense Ammunition to Ukraine**

The Pentagon said it will send Ukraine up to \$400 million in artillery ammunition, weapons and supplies in its latest drawdown package to help the nation defend itself against Russia. The security assistance package announced Wednesday includes more ammunition for High Mobility Artillery Rocket Systems, or HIMARS, high-speed anti-radiation missiles, or HARMs, and 200 precision-guided 155mm artillery rounds, the U.S. Department of Defense said in a statement. It



also includes 150 heavy machine guns with thermal imagery sights that Ukraine could use to shoot down Russian drones, the Pentagon said, as well as 10,000 120mm mortar rounds and additional munitions for National Advanced Surface-to-Air Missile Systems, or NASAMS, air defense systems developed by Norway's Kongsberg Defence and Aerospace and U.S. firm Raytheon Technologies.

“With Russia’s unrelenting and brutal missile and [unmanned aerial systems] attacks on Ukrainian critical energy infrastructure, additional air defense capabilities remain an urgent priority,” the Pentagon said. “The additional munitions for NASAMS and heavy machine guns will help Ukraine counter these urgent threats.” The package also includes 150 Humvees, more than 100 light tactical vehicles, more than 200 generators, spare parts for 105mm Howitzers and other equipment and more than 20 million rounds of small arms ammunition. This drawdown will be the U.S. military’s 26th for Ukraine since August 2021. The Pentagon said the U.S. has provided about \$22 billion in security assistance to Ukraine since 2014, with more than \$19 billion of that coming since Russia invaded the country in February.

<https://www.defensenews.com/air/2022/11/23/us-to-send-anti-drone-machine-guns-air-defense-ammunition-to-ukraine/>

## ThePrint

*Wed, 23 Nov 2022*

### **West Probes China’s Headhunting of its Military Personnel**

After reports about China’s headhunting of its military personnel last month, pressure is growing on Western countries for a probe against the reported recruitment of retired military officials from the United Kingdom, Australia, and New Zealand. Last month, The New York Times (NYT) reported that China has hired nearly 30 retired British military pilots to train pilots in the People’s Liberation Army. Writing for Portal Plus publication, columnist Valerio Fabbri said pressure is increasing for investigation against reported recruitment of retired military officials from these countries by Chinese agents in South Africa. “Taking a cue from the UK, which earlier discovered and initiated an investigation against such recruitments, Australian military is also investigating reports of its former pilots accepting training roles in China,” he said.

In October, Britain’s Defence Ministry issued a threat alert fearing that the practice could threaten its national security. The UK government also said it is working with allies to try to stop China’s bid to recruit British pilots using third-party liaisons, which includes former members of the Royal Air Force and other armed forces. “We are taking decisive steps to stop Chinese recruitment schemes attempting to head hunt serving and former U.K. Armed Forces pilots to train People’s Liberation Army personnel in the People’s Republic of China,” a spokesman for the Defence Ministry, who spoke under the condition of anonymity, as quoted by NYT.

Beijing is reportedly hiring mostly pilots for contracts as lucrative as USD 270,000 a year, via a South African company Test Flying Academy of South Africa (TFASA). Citing media reports, Fabbri said TFASA also runs a flight school for Chinese airline pilots in South Africa as a joint venture with one of China’s largest state-owned aeronautic companies, AVIC. Using TFASA, China targeted those with direct access to the latest, closely guarded, defence initiatives. Aside from UK, Australia has also launched probe into these reports. Australia’s Defence Minister



Richard Marles said that he had asked for probe into claims that former Australian military pilots are being recruited by the South African flight school to work in China. "I would be deeply shocked and disturbed to hear that there were personnel who were being lured by a paycheck from a foreign state above serving their own country," he was quoted as saying by Portal Plus.

<https://theprint.in/world/west-probes-chinas-headhunting-of-its-military-personnel/1231116/>

## THE ECONOMIC TIMES

Wed, 23 Nov 2022

### **Moscow Says on Alert after Crimea Hit by 'Drone Attack'**

Ukraine's Russian-annexed Crimean peninsula was targeted by a drone attack on Tuesday, Kremlin-installed authorities said, adding that Moscow's forces there were "on alert". The strike came as Kyiv claimed another territorial victory and just days after Moscow said it was strengthening its position on the Crimean peninsula. "There is an attack with drones," the governor of the Sevastopol administrative region in Crimea, Mikhail Razvozhayev, said on Telegra "Our air defence forces are working right now." He said two drones had "already been shot down". Razvozhayev said no civilian infrastructure had been damaged and called on residents to "remain calm." Moscow annexed Crimea in 2014 after nationwide pro-democracy demonstrations that led to the ouster of Ukraine's Kremlin-friendly president.

It used the peninsula, which hosts several important Russian military bases, as a launching pad for its February invasion of Ukraine. But in recent months Ukrainian forces have been pushing a counter-offensive in the south towards Crimea and earlier this month reclaimed Kherson, the capital of the region bordering the annexed peninsula. There have been several explosions at or near Russian military installations in Crimea since February, including a coordinated drone attack on a key Russian naval port at Sevastopol in October. Last week the Moscow-aligned governor of the territory, Sergei Aksyonov, said authorities were strengthening positions on the peninsula. "Fortification work is being carried out... with the aim of guaranteeing the security of all Crimeans," he said. - 'Not tired' - Ukraine said Tuesday it had recaptured almost the entire region of an isolated peninsula off the Black Sea, where fighting is ongoing. "We are restoring full control over the region. We have three settlements left on the Kinburn Split to officially no longer be a region at war," said Mykolaiv regional governor Vitaly Kim on social media.

The southern split jutting into the Black Sea is divided in two: in the west, as part of the Mykolaiv region and to the east as part of the Kherson region. It is cut off from territory controlled by Ukraine's forces by the Dnipro river, which flows through the Kherson region. Foreign Minister Dmytro Kuleba told the European Union in an online press conference that its support was crucial, warning against "fatigue" towards the war. "If we Ukrainians are not tired, the rest of Europe has neither moral nor political right to be tired," he said. - Aid and gas - Kuleba called on the EU to implement a fresh round of sanctions against Russia, urging particular attention to measures that slow down and stop Russia's missile industry. "I call on my colleagues in the EU... to put aside any doubts or, as the fashionable phrase goes, 'fatigue' and to start and quickly conclude the ninth sanctions package," he said.

The US government said Tuesday it would provide another \$4.5 billion in financial backing for "supporting core government services." As much of Ukraine's energy grid is pounded by Russian

strikes, the World Bank has warned the country faces severe energy supply disruption amid frigid weather. "The Kremlin wants to transform the cold this winter into a weapon of mass destruction," Ukraine President Volodymyr Zelensky told a meeting of French mayors in a video message. Meanwhile Russian energy giant Gazprom accused Ukraine of diverting natural gas supplies transiting to Moldova, and threatened to curtail deliveries through a key pipeline to Europe in response. The allegations marked the latest point of tension over energy deliveries between Kyiv, European capitals and Moscow -- which has reduced consignments to Europe in response to Western sanctions over the conflict. Ukraine denied the allegations, saying that all the gas bound for Moldovan consumers had been transferred in full.

<https://economictimes.indiatimes.com/news/defence/moscow-says-on-alert-after-crimea-hit-by-drone-attack/articleshow/95717324.cms>

## Science & Technology News

# अमरउजाला

बुधवार, 23 नवंबर 2022

## ईवी व 5जी को मिलेगी रफ्तार: देश में ही बनेगा गैलियम नाइट्रेट सेमीकंडक्टर, डीआरडीओ और आईआईएससी ने शुरू किया काम

इलेक्ट्रिक वाहनों को तेजी से चार्ज करने और 5जी नेटवर्क के संचालन में महत्वपूर्ण भूमिका निभाने वाला गैलियम नाइट्रेट सेमीकंडक्टर जल्द देश में ही निर्मित होगा। देश को आत्मनिर्भर बनाने के लिए डीआरडीओ और बेंगलुरु स्थित इंडियन इंस्टीट्यूट ऑफ साइंस ने इस दिशा में काम शुरू कर दिया है। यह जानकारी डीआरडीओ के वैज्ञानिक डीएस रावल और एसके तोमर ने दी। दोनों वैज्ञानिक मंगलवार को पंजाब इंजीनियरिंग कॉलेज में आयोजित एक कार्यक्रम में पहुंचे थे। कार्यक्रम में देशभर से पहुंचे वैज्ञानिकों ने बताया कि तकनीक तेजी से बदल रही है। ऐसे में सेमीकंडक्टर बनाने, उसकी जांच और उसकी विश्वसनीयता की जांच करने की तकनीक का ज्ञान होना बहुत जरूरी है। बताया कि सभी रडार, हाई पावर डिवाइस, सेटेलाइट में गैलियम नाइट्रेट सेमीकंडक्टर का उपयोग होता है। 5जी नेटवर्क के संचालन या इलेक्ट्रॉनिक व्हीकल को तेजी से चार्ज करने के लिए भी इसी सेमीकंडक्टर का प्रयोग किया जाता है। वर्तमान में इसे यूएसए और चीन से आयात किया जा रहा है लेकिन अब इसे देश में ही तैयार किया जाएगा।

## कीमत 6 से 10 लाख, अगले तीन साल में आत्मनिर्भर बनने की तैयारी

वैज्ञानिकों ने बताया कि बाजार में चार इंच के गैलियम नाइट्रेट सेमीकंडक्टर की कीमत 6 से 10 लाख रुपये तक है। जितनी हाई फ्रिक्वेंसी पर डिवाइस को काम करना है उतने ही सेमीकंडक्टर का उपयोग किया जाता है। 40 गीगा हर्ट्ज पावर की बैटरी के लिए भी इसी सेमीकंडक्टर का सहारा लेना पड़ता है। डीआरडीओ के साथ ही इंडियन इंस्टीट्यूट ऑफ साइंस ने बाहर से कुछ मशीनें मंगवाई हैं जिन पर तेजी से काम हो रहा है। अगले लगभग तीन सालों में देश को इस क्षेत्र में आत्मनिर्भर बनाने का लक्ष्य है।

## पेक में देशभर के संस्थानों से 38 विशेषज्ञ ले रहे हैं प्रशिक्षण

पेक के एसोसिएट प्रोफेसर प्रो. अरुण कुमार सिंह ने कहा कि संस्थान में स्थापित सेमीकंडक्टर रिसर्च सेंटर को सैद्धांतिक व व्यावहारिक अनुभव के आधार पर डिजाइन किया गया है। यहां प्रशिक्षण के लिए देशभर के विभिन्न आईआईटी, एनआईआईटी, शोध संस्थानों से 70 से अधिक आवेदन आए थे। इनमें से 38 आवेदन स्वीकार किए गए हैं। इन लोगों को 7 दिनों में सेमीकंडक्टर बनाने, जांचने और उनकी गुणवत्ता को परखने का व्यवहारिक और प्रायोगिक ज्ञान दिया जाएगा।

## क्या होती है सेमीकंडक्टर

सेमीकंडक्टर एक खास तरह की चिप होती है। इसमें विद्युत के सुचालक और कुचालक के गुण होते हैं। ये विद्युत के प्रवाह को नियंत्रित करती है। इसका निर्माण सिलिकॉन से होता है। कई हाईटेक उपकरणों में इस चिप को इंस्टॉल किया जाता है। सेमीकंडक्टर चिप के जरिए ही डाटा की प्रोसेसिंग होती है। इस कारण इसको इलेक्ट्रॉनिक डिवाइस का दिमाग भी कहा जाता है।

<https://www.amarujala.com/chandigarh/gallium-nitrate-semiconductor-will-soon-be-manufactured-in-india>



Wed, 23 Nov 2022

## Jharkhand to Train 1 Lakh Cyber Security Professionals to Tackle Jamtara Cybercriminals

Jharkhand will train one lakh cybersecurity professionals to thwart the Jamtra cybercriminals gangs, the Jharkhand government has announced. During a workshop at the Jharkhand Technical University, it was announced that the Department of Higher and Technical Education in partnership with Jharkhand Technical University and Cyber Vidyapeeth Foundation is looking to train over one lakh cyber fighters in the coming 5 years. Online 'Cyber Vidyapeeth' has been started with the goal to develop the state as a cyber defence corridor. It was announced that the cyber fighters would be the most important part of the corridor.

To achieve this target, cyber security skill courses have been started in the state's Vinoba Bhave University and Cyber Vidyapeeth Foundation. Shashank S. Garudayar, chairman of Cyber Vidyapeeth Foundation, said that excellent career prospects would be available for the youth trained in the cyber protection course. He added that the sector had a shortage of talent with a need for 3.1 million cyber trainers and 60 million cyber professionals worldwide. The initiative in Jharkhand is a step in this direction, said Garudayar. He stated the possibility of the area being developed into a cyber defence business hub. Jharkhand is a 'focus state' in the field of cyber security, as the Jamtara module remains a challenge for the entire country.

<https://www.timesnownews.com/technology-science/jharkhand-to-train-1-lakh-cyber-security-professionals-to-tackle-jamtara-cybercriminals-article-95702274/amp>



बुधवार, 23 नवंबर 2022

## NASA के ओरियन अंतरिक्ष यान ने करीब से की चंद्रमा की परिक्रमा

अमेरिकी अंतरिक्ष एजेंसी नासा के ओरियन अंतरिक्ष यान ने पहली बार चंद्रमा की सतह के 130 किलोमीटर के दायरे में परिक्रमा पूरी की। नासा के अनुसार, आर्टेमिस-1 मिशन के तहत ओरियन ने छठे दिन दूर स्थित प्रतिकूल कक्षा में प्रवेश के लिए जरूरी सहायक इंजन का इस्तेमाल करते हुए पहले मैनोवर (कलाबाजी) के साथ चौथे कक्षीय प्रक्षेप पथ को पूरा किया। अमेरिकी अंतरिक्ष एजेंसी ने मंगलवार को जारी बयान में बताया कि ओरियन अंतरिक्ष यान ने चंद्रमा के सबसे करीब से परिक्रमा (फ्लाईबाई) 21 नवंबर को पूरी की। आर्टेमिस-1 मिशन के प्रबंधक माइस सराफिन के अनुसार, 'हमने जैसी योजना की थी, मिशन उसी तरह आगे बढ़ रहा है। प्रणालियां, परिचालन टीम व ओरियन अंतरिक्ष यान अपेक्षा से बेहतर काम कर रहे हैं। हमें इस गहरे अंतरिक्ष में यात्रा करने वाले यान से नई जानकारियां हासिल हो रही हैं।'

ओरियन शुक्रवार को दूसरे मैनोवर के साथ चंद्रमा से दूर स्थित प्रतिकूल कक्ष में प्रवेश करेगा, जिसे डिस्टेंट रेट्रोग्रेड आर्बिट इंसर्शन बर्न कहा जाता है। यह एक उच्च स्थिर कक्ष है, जहां टिके रहने के लिए बहुत कम ईंधन की जरूरत होती है। इसमें पृथ्वी से बाहर के वातावरण में रहने की ओरियन की क्षमता का भी परीक्षण होगा। अपोलो-13 के रिकार्ड को पार करते हुए ओरियन 25 नवंबर को चंद्रमा से सबसे दूर बिंदु पर लगभग 92,194 किलोमीटर की यात्रा करेगा। आर्टेमिस-1 नासा के स्पेस लांच सिस्टम (एसएलएस) का पहला एकीकृत फ्लाइट टेस्ट है, जिसके जरिये मानवरहित अंतरिक्ष यान ओरियन को अंतरिक्ष में भेजा गया है। वर्ष 1972 में अपोलो मिशन की समाप्ति के बाद नासा ने पहली बार वर्ष 2025 में चंद्रमा पर अंतरिक्ष यात्रियों को उतारने की योजना की है।

<https://www.jagran.com/world/america-nasa-orion-spacecraft-closely-orbits-the-moon-23222952.html>

