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समाचार पत्रों से चयनित अंश

Newspapers Clippings

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

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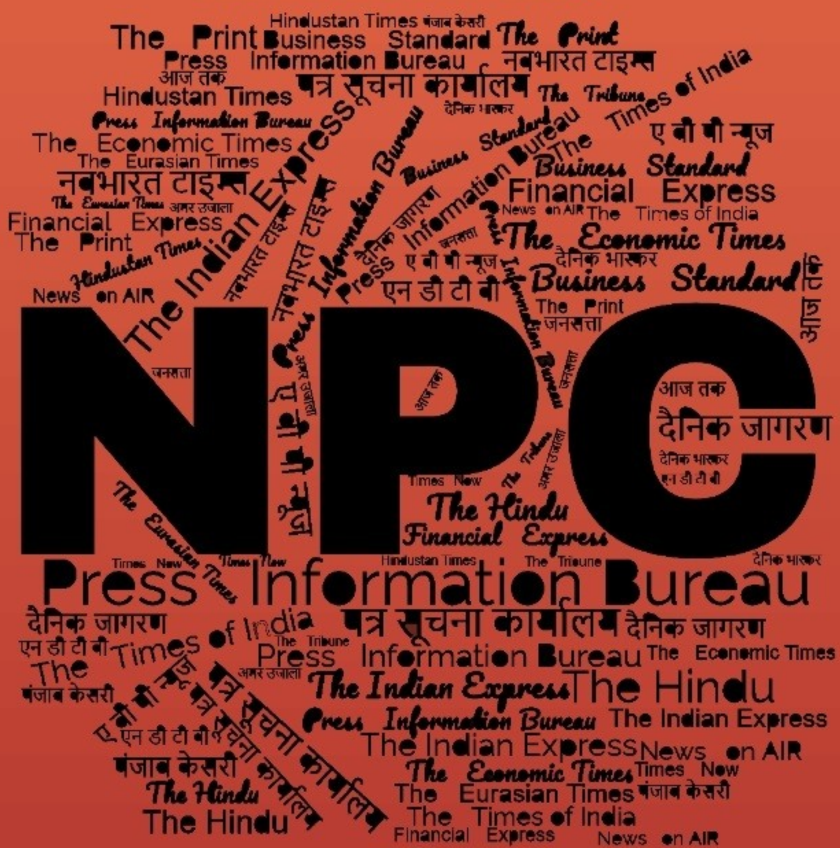

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CONTENTS

DRDO News

क्या है DRDO का क्वांटम टेक्नोलॉजी रिसर्च सेंटर, जिसका आज हुआ है उद्घाटन; जानिए खूबियां

Source: TimesNow NavBharat, Dt. 27 May 2025,
URL: https://www.timesnowhindi.com/knowledge/what-is-drdos-quantum-technology-research-center-article-151734191

रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) ने मंगलवार को दिल्ली स्थित मेटकाफ हाउस में क्वांटम टेक्नोलॉजी रिसर्च सेंटर का उद्घाटन किया। इस अत्याधुनिक केंद्र का उद्घाटन रक्षा अनुसंधान एवं विकास विभाग के सचिव और डीआरडीओ अध्यक्ष डॉ. समीर वी. कामत ने किया। इस उद्घाटन समारोह में डीजी (माइक्रो इलेक्ट्रॉनिक डिवाइसेस, कम्प्यूटेशनल सिस्टम्स एवं साइबर सिस्टम्स) सुमा वरुधीस ने भी भाग लिया, जिनकी दूरदर्शिता और नेतृत्व इस अत्याधुनिक सुविधा के विचार को साकार करने में महत्वपूर्ण रहे।

क्वांटम टेक्नोलॉजी रिसर्च सेंटर का उद्देश्य

इस सेंटर को शुरू करने का उद्देश्य रणनीतिक और रक्षा अनुप्रयोगों के लिए स्वदेशी क्वांटम क्षमताओं को और मजबूत करना है। रक्षा मंत्रालय के मुताबिक यह केंद्र अत्याधुनिक प्रयोगात्मक सुविधाओं से सुसज्जित है, जो महत्वपूर्ण क्वांटम क्षेत्रों में अनुसंधान एवं विकास को गति प्रदान करेगा। इस केंद्र में कई प्रमुख क्षमताओं को शामिल किया गया हैं। यहां वर्टिकल–कैविटी सरफेस–एमिटिंग लेज़र और डिस्ट्रीब्यूटेड फीडबैक लेज़र्स का चरित्रांकन हो सकेगा। सिंगल–फोटॉन स्रोतों के परीक्षण के लिए टेस्ट–बेड है। माइक्रो फैब्रिकेटेड अल्कली वेपर सेल का विश्लेषण

होगा। क्वांटम की डिस्ट्रीब्यूशन तकनीकों के विकास और सत्यापन के लिए प्रयोगात्मक प्लेटफॉर्म भी उपलब्ध हैं। ये प्लेटफॉर्म पोस्ट–क्वांटम युग में अत्यंत सुरक्षित संचार सुनिश्चित करने के लिए डीआरडीओ द्वारा संचालित है।

रक्षा मंत्रालय ने क्या कहा

रक्षा मंत्रालय का कहना है कि सॉलिड स्टेट फिजिक्स लेबोरेटरी द्वारा संचालित यह सेंटर, कुछ बुनियादी तकनीकों पर भी कार्य कर रहा है। इनमें कोहीरेंट पॉपुलेशन ट्रैपिंग आधारित अल्ट्रा–स्मॉल एटॉमिक क्लॉक है जो ग्लोबल नेविगेशन सैटेलाइट सिस्टम के अभाव में भी अत्यंत सटीक समय निर्धारण सुनिश्चित करता है। सेंसिटिव मैग्नेटिक फील्ड डिटेक्शन के लिए ऑप्टिकली पंप्ड मैग्नेटोमेट्री पर आधारित एटॉमिक मैग्नेटोमीटर है।

DRDO की क्या है तैयारी

यहां नवीनतम सॉलिड–स्टेट क्वांटम डिवाइसेस और सामग्री का विकास सुनिश्चित किया जाएगा। डीआरडीओ का कहना है कि वह भारत की क्वांटम पहलों का नेतृत्व करते हुए क्वांटम सेंसिंग, सुरक्षित संचार और पोस्ट–क्वांटम क्रिप्टोग्राफी जैसे क्षेत्रों में कार्यरत है। राष्ट्रीय क्वांटम मिशन के एक प्रमुख भागीदार के रूप में डीआरडीओ स्वदेशी नवाचार को बढ़ावा देने और संप्रभु क्वांटम तकनीकों के विकास के लिए प्रतिबद्ध है, जिससे भारत की रणनीतिक सुरक्षा को सुनिश्चित किया जा सके।

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DRDO inaugurates Quantum Technology Research Centre to further bolster indigenous quantum capabilities for strategic & defence applications

Source: Press Information Bureau, Dt. 27 May 2025,
URL: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2131757

Defence Research and Development Organisation (DRDO) inaugurated the Quantum Technology Research Centre (QTRC) at Metcalfe House, Delhi on May 27, 2025. The facility was inaugurated by Secretary, Department of Defence R&D and Chairman, DRDO Dr Samir V Kamat with the aim to further strengthen indigenous quantum capabilities for strategic and defence applications.

QRTC is equipped with state-of-the-art experimental set-ups designed to propel research and development in critical quantum domains. The key capabilities of this centre include Characterisation of Vertical-Cavity Surface-Emitting Lasers and Distributed Feedback Lasers; Test-beds for evaluating single-photon sources; Set-up for characterisation of Micro Fabricated Alkali Vapor Cell; and Experimental platforms for developing and validating Quantum Key Distribution techniques to enable ultra-secure communication and safeguard national security in the post-quantum era, spearheaded by Scientific Analysis Group (SAG), DRDO.

Spearheaded by Solid State Physics Laboratory (SSPL), QTRC also focuses on foundational technologies including an Ultra-Small Atomic Clock based on Coherent Population Trapping for highly precise timekeeping in Global Navigation Satellite System-denied environments, an Atomic Magnetometer using optically pumped magnetometry for ultra-sensitive magnetic field detection, and Cutting-edge solid-state quantum devices and materials.

DRDO continues to lead India's quantum initiatives across verticals such as quantum sensing, secure communications, and post-quantum cryptography. As a key stakeholder in the National Quantum Mission, DRDO is committed to fostering indigenous innovation and developing sovereign quantum technologies to secure India's strategic future.

The inauguration ceremony was graced by Director General (Micro Electronic Devices, Computational Systems & Cyber Systems) Smt Suma Varughese whose vision and leadership were instrumental in conceptualising this cutting-edge facility. DG (Resource & Management) Dr Manu Korulla and Directors of SSPL and SAG, senior scientists, and other dignitaries attended the function.

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भारत के लड़ाकू ड्रोन की बढ़ेगी ताकत, डीआरडीओ ने रूस में शुरू किया कावेरी इंजन का परीक्षण

Source: Amar Ujala, Dt. 27 May 2025,
URL: https://www.amarujala.com/india-news/strength-of-india-s-combat-drones-will-increase-drdo-starts-testing-of-kaveri-engine-in-russia-2025-05-27

भारत के लड़ाकू ड्रोन की ताकत बढ़ाने की तैयारी हो रही है। भारत की प्रमुख रक्षा अनुसंधान एजेंसी रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) ने कावेरी इंजन तैयार कर लिया है। यह इंजन ड्रोन को शक्ति देगा। इस इंजन का डीआरडीओ रूस में परीक्षण कर रहा है।

रक्षा अधिकारियों ने बताया कि कावेरी का रूस में परीक्षण चल रहा है। इसका करीब 25 घंटे का परीक्षण बाकी है। यह स्लॉट रूस के अधिकारियों को देना है। इस इंजन का उपयोग स्वदेशी यूएवी परियोजना को शक्ति प्रदान करने के लिए किए जाने की योजना है। रक्षा अफसरों ने बताया कि कावेरी इंजन को एलसीए विमान में लगाने और

इसकी क्षमता का प्रदर्शन करने की योजना बनाई गई है। डीआरडीओ पांचवी पीढ़ी के लड़ाकू विमान के मार्क 2 संस्करण समेत भविष्य के विमानों के लिए अधिक शक्तिशाली इंजन के विकास और निर्माण के लिए एक विदेशी फर्म के साथ काम कर रहा है।

डीआरडीओ ने कावेरी इंजन को स्वदेशी हल्के लड़ाकू विमान के लिए विकसित करने की योजना बनाई थी, लेकिन कार्यक्रम में देरी के कारण लड़ाकू विमान को अमेरिकी जीई–404 इंजन द्वारा संचालित करना पड़ा। जीई–404 का उपयोग 32 एलसीए मार्क 1 और ट्विन सीटर ट्रेनर संस्करणों को शक्ति प्रदान करने के लिए किया गया है। 83 एलसीए मार्क 1ए को भी जीई–404 द्वारा संचालित किया जाना है, लेकिन अमेरिकी फर्म के आपूर्ति में समस्याओं करने से योजना में देरी हो गई।

भारत रक्षा उपकरणों की तकनीक के लिए फ्रांस, ब्रिटेन और अमेरिका की कई कंपनियों से बात कर रहा है। इस संबंध में निकट भविष्य में कई निर्णय लिए जाने की उम्मीद है। लड़ाकू विमानों के लिए भारतीय स्वदेशी कार्यक्रम का उद्देश्य आयात में कटौती करना और वायुसेना के लिए स्वदेशी प्लेटफार्म उपलब्ध कराना है।

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आकाश मिसाइल की 'आसमान' में बढ़ेगी बुलंदी, रेंज बढ़ाने के लिए DRDO ने बना लिया प्लान!

Source: Zee Bharat, Dt. 27 May 2025,
URL: https://zeenews.india.com/hindi/zee-hindustan/national/drdo-will-enhance-akash-missile-system-with-propulsion-fuel-will-increase-range/2774884

भारत और पाकिस्तान के बीच हुए चार दिन के संघर्ष में दो हथियारों ने सबसे ज्यादा सुर्खियां बटोरीं. एक तो S–400 एयर डिफेंस सिस्टम और दूसरा आकाश मिसाइल सिस्टम. भारत ने तय किया है कि वह रूस से कुछ और S–400 सिस्टम खरीदेगा. मुमकिन है कि NSA अजीत डोभाल मॉस्को यात्रा के दौरान इस सौदे पर चर्चा करें. दूसरी ओर, रक्षा अनुसंधान और विकास संगठन (DRDO) ने आकाश मिसाइल सिस्टम को अधिक ताकतवर बनाने के लिए योजना बनाई है.

DRDO क्या करने वाला है?

DRDO ने भारत–पाक संघर्ष में आकाश मिसाइल सिस्टम की शानदार परफॉर्मेंस देखने के बाद इसे अधिक मजबूत बनाने का प्लान बनाया है. दरअसल, रक्षा अनुसंधान और विकास संगठन आकाश मिसाइल सिस्टम में Propulsion Fuel का इस्तेमाल करने का प्लान बनाया है. ऐसा करने पर 'आकाश' के एयरफ्रेम और डिजाइन में बिना कोई चेंज किए इसे बेहतर बनाया जा सकता है.

क्या है Propulsion Fuel?

Propulsion Fuel आमतौर पर रॉकेट, मिसाइल या अंतरिक्ष यान में डाला जाता है, जो उनकी स्पीड को बढ़ाता है. ये ज्यादा एनर्जी पैदा करके इनकी गति में इजाफा करता है. इस फ्यूल के इस्तेमाल से थ्रस्ट यानी जोर पैदा होता है, जो व्हीकल को आगे की ओर धकेलता है. आकाश मिसाइल सिस्टम में इस खास फ्यूल का इस्तेमाल रैमजेट सस्टेनर मोटर में किया जाएगा, जो मिसाइल को उड़ान के दौरान इसको अधिक फोर्स से पुश करेगा. नतीजतन, स्पीड तेज रहेगी और रेंज भी बढ़ेगी.

आकाश मिसाइल कैसे भारत के लिए खास?

आकाश मिसाइल सिस्टम के जरिये दुश्मन के ड्रोन, फाइटर जेट्स और सैन्य ठिकानों को निशाना बनाया जा सकता है. आकाश के हर लॉन्चर में तीन मिसाइलें होती हैं, जो 'फायर एंड फॉरगेट' मोड पर काम करती हैं. एक मिसाइल की लंबाई 20 फीट होती है और वजन भी 710 किलो के आसपास होता है. इसका वारहेड 60 किलो का होता है. ये सिस्टम रियल–टाइम मल्टी–सेंसर डेटा प्रोसेसिंग से लैस है, जिससे खतरे को तुरंत पहचान नष्ट किया जा सकता है.

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Defence News

Defence Strategic: National/International

India unveils industry partnership model to fast-track stealth fighter project

Source: Hindustan times, Dt. 28 May 2025,
URL: https://www.hindustantimes.com/india-news/india-unveils-industry-partnership-model-to-fast-track-stealth-fighter-project-101748372542907.html

India on Tuesday unveiled its long-awaited plan to fast-track the development of an indigenous fifth-generation stealth fighter, or the advanced medium combat aircraft (AMCA), announcing that the execution model will be competitive and provide equal opportunities to public and private sector firms to participate in one of the country's most significant military projects.

The approval of the industry partnership model by defence minister Rajnath Singh comes at a critical moment as state-run plane maker Hindustan Aeronautics Limited (HAL) --- the sole manufacturer of fighter jets in the country --- was so far believed to be the front-runner for the prestigious project.

Singh's approval comes weeks after the May 7-10 military confrontation with Pakistan under Operation Sindoor --- India's muscular military response to the Pahalgam terror strike. The four-day clash put the spotlight on the Indian Air Force's deep strike capabilities and the role of locally produced weapons and systems. It also led the government to reaffirm its commitment to equip the three services with the latest weapons and platforms --- a stealth fighter has been on the IAF's wish list for long.

The model unlocks new possibilities for the local aerospace industry, including firms such as Tata Advanced Systems Limited, Larsen & Toubro, Adani Defence and Aerospace and the Mahindra Group, people aware of the matter said. HAL is still a strong contender for the project, they added, asking not to be named.

The defence ministry explained how the project will unfold. The Defence Research and Development Organisation's Aeronautical Development Agency (ADA) will execute the programme through industry partnership, it said.

"The model provides equal opportunities to both private and public sectors on a competitive basis. They can bid either independently or as joint venture or as consortia. The entity/bidder should be an Indian company compliant with the laws and regulations of the country," the ministry said in a statement. The ministry described it as an important step for harnessing the indigenous expertise, capability and capacity to develop the AMCA prototype, a self-reliance milestone in the aerospace sector.

Speeding up the AMCA programme is critical as China has already deployed the J-20 fifth-generation fighters, it is rolling out the J-35 stealth fighters that Pakistan is looking at buying, and it has tested two so-called sixth-generation platforms designated J-36 and J-50, the people said. Sixth-generation technologies are more advanced than those in any fighter jet currently in service globally.

The defence ministry said the AMCA's execution model was "a significant push towards enhancing India's indigenous defence capabilities and fostering a robust domestic aerospace industrial ecosystem."

Last year, the PM-headed Cabinet Committee on Security (CCS) approved the AMCA's design and prototype development at a cost of around ₹15,000 crore. ADA will soon invite expressions of interest in the AMCA development phase, the defence ministry said. This is a watershed in India's defence production history as it marks the possible entry of the private sector in fighter aircraft manufacturing.

This involves the design and development of five twin-engine AMCA prototypes, with the stealth fighter likely to go into production only after a decade. The IAF's modernisation map envisages the deployment of around 120 stealth fighters (six squadrons) 2035 onwards, with the advanced planes forming an important element of future air combat, officials aware of the matter said.

India is firmly pushing ahead with the AMCA programme even though both the United States and Russia have offered New Delhi their fifth-generation fighters. In February, US President Donald Trump said America is paving the way to provide India the F-35 stealth fighters. Earlier this year, Russia offered to jointly produce its Su-57 stealth fighter in the country.

"Starting this year, we will be increasing military sales to India by many billions of dollars. We are also paving the way to ultimately provide F-35 stealth fighters," Trump said at the time. The AMCA is expected to be developed in two phases, the officials said.

The first two squadrons will consist of the Mk-1 version of AMCA powered by the American F-414 engines, while the remaining four squadrons will have the more advanced Mk-2 version equipped with an even more powerful engine to be built in India with foreign collaboration.

The 25-tonne AMCA will be a swing-role fighter with stealth features to increase survivability in combat, advanced avionics, smart weapons stored internally, top-end mission computers, 360-

degree situational awareness, and super-cruise capability that will allow it to fly at supersonic speeds for extended periods without kicking in fuel-guzzling afterburners.

India was earlier planning to co-develop a stealth fighter with Russia, but the proposed fifth-generation fighter aircraft (FGFA) project was abandoned after IAF expressed strong reservations over high cost and limited technology transfer.

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COAS General Upendra Dwivedi witnesses demonstration of indigenous weapons at Babina Field Firing Ranges

Source: The Economic times, Dt. 28 May 2025,
URL: https://economictimes.indiatimes.com/news/defence/coas-general-upendra-dwivedi-witnesses-demonstration-of-indigenous-weapons-at-babina-field-firing-ranges/articleshow/121453594.cms

Chief of the Army Staff (COAS) General Upendra Dwivedi witnessed cutting-edge demonstrations of indigenous UAS, Counter-UAS and Loitering Munitions at Babina Field Firing Ranges. In a post on X, the Additional Directorate General of Public Information (ADGPI), Indian Army asserted on Tuesday that the capabilities will significantly enhance operational efficiency, force protection and precision engagement across varied terrains.

"General Upendra Dwivedi, COAS, witnessed cutting-edge demonstrations of indigenous UAS, Counter-UAS and Loitering Munitions on 27 May 2025 at Babina Field Firing Ranges," the post stated.

"These capabilities will significantly enhance operational efficiency, force protection and precision engagement across varied terrains," it added. Meanwhile, the Indian army has released a booklet to its personnel on Operation Sindoor, showing the operations room from where the military top brass monitored the operation against Pakistan.

The image released by the Indian army displays Chief of the Army Staff (COAS) General Upendra Dwivedi, Navy Chief Admiral Dinesh K Tripathi and Air Force Chief Marshal AP Singh leading the operation.

Operation Sindoor was India's decisive military response to the April 22 Pahalgam terror attack. Launched on May 7, Operation Sindoor led to the death of over 100 terrorists affiliated with terror outfits like the Jaish-e-Mohammed, Lashkar-e-Taiba, and Hizbul Mujahideen.

After the attack, Pakistan retaliated with cross-border shelling across the Line of Control and Jammu and Kashmir as well as attempted drone attacks along the border regions, following which India launched a coordinated attack and damaged radar infrastructure, communication centres, and airfields across 11 airbases in Pakistan. After this, on May 10, an understanding of the cessation of hostilities between India and Pakistan was announced.

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Mongolian army delegation visits Shatrujeet Brigade, enhancing India-Mongolia bilateral defence cooperation ties

Source: ANI News, Dt. 28 May 2025,
URL: https://www.aninews.in/news/national/general-news/mongolian-army-delegation-visits-shatrujeet-brigade-enhancing-india-mongolia-bilateral-defence-cooperation-ties20250528090933/

A 19-member delegation from the Mongolian Army, led by Brigadier General Ontsgoibayar Lkhamjii, visited the Indian Army's Shatrujeet Brigade to gain firsthand insight into the professional aspects of airborne troops. This visit marked a key step in strengthening India-Mongolia defence cooperation.

In a post on X, SuryaCommand IA wrote," Mongolian Delegation Visits Shatrujeet Brigade. A 19-member Mongolian Army delegation, headed by Brigadier General Ontsgoibayar Lkhamjii, visited the Shatrujeet Brigade. The delegation was given firsthand insight into the professional aspects of Airborne troops, a significant step in bolstering India-Mongolia bilateral defence cooperation."

The two armies had earlier engaged in a field exercise called Nomadic Elephant held in July 2024. The exercise is conducted on an annual basis. The Indian contingent, comprising 45 personnel, was represented by a battalion of SIKKIM SCOUTS and personnel from other arms and services. The Mongolian contingent was represented by personnel from the 150 Quick Reaction Force Battalion of the Mongolian Army. Exercise NOMADIC ELEPHANT was an annual training event conducted alternately in India and Mongolia.

As per the MoD statement, the exercise aimed to enhance the joint military capability of both sides to undertake counter-insurgency operations in a sub-conventional scenario under Chapter VII of the United Nations Mandate. The exercise focused on operations in semi-urban and mountainous

terrain. Tactical drills during the exercise included responding to a terrorist action, establishing a joint command post, establishing an intelligence and surveillance centre, securing a helipad/landing site, small team insertion and extraction, special heliborne operations, cordon and search operations, and the employment of drones and counter-drone systems, among other things.

Exercise NOMADIC ELEPHANT enabled both sides to share their best practices in tactics, techniques, and procedures for conducting joint operations. The exercise also facilitated the development of interoperability, bonhomie, and camaraderie between the two armies. It further enhanced the level of defence cooperation, augmenting bilateral relations between the two friendly nations.

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Indian Govt To Buy 500 Invar Anti-Tank Guided Missiles Worth ₹2,000–3,000 Crore From Bharat Dynamics

Source: Swarajya, Dt. 27 May 2025,
URL: https://swarajyamag.com/news-brief/indian-govt-to-buy-500-invar-anti-tank-guided-missiles-worth-20003000-crore-from-bharat-dynamics

The Ministry of Defence is finalising a major procurement order for 500 Invar anti-tank guided missiles (ATGMs) from Bharat Dynamics Ltd (BDL), Money Control reported. These missiles are intended to bolster India's armoured warfare capabilities, specifically enhancing the firepower of T-90 tanks.

"Invar missiles are designed to be launched from tank platforms. The Defence Ministry is finalising an order for 500 missiles from BDL, with the total expenditure expected to be in the range of Rs 2,000 crore–3,000 crore," Money Control quoted an official.

Known for their precision strike capability, the Invar missiles are already deployed on India's frontline T-90 main battle tanks. The final value of the deal is currently under financial vetting, which will determine the level of approval required. According to the official quoted in the report, orders of up to Rs 2000 crore are cleared by the Defence Minister, those closer to Rs 3000 crore are to be done by the Finance Minister and any deal above that amount would require approval of the Cabinet.

This procurement is part of a broader government initiative to promote self-reliance in defence manufacturing under the Make in India campaign. According to the report, Bharat Dynamics Ltd, a key supplier to the Indian Armed Forces, is at the forefront of this effort with a strong order book of Rs 3,110 crore and projected revenue growth of 28–30 per cent in FY25.

The planned acquisition comes shortly after Operation Sindoor, a precision military strike against terrorist infrastructure in Pakistan following a deadly attack in Pahalgam.

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India looks to revive '71 war airbase as China builds near 'chicken's neck'

Source: Business Standard, Dt. 27 May 2025,
URL: https://www.business-standard.com/external-affairs-defence-security/news/india-revives-kailashahar-airbase-china-lalmonirhat-upgrade-125052701761_1.html

India is reportedly accelerating the revival of a long-defunct airfield in Tripura in a calibrated response to reports that China is aiding the development of a World War II-era airbase in Bangladesh's Lalmonirhat district, less than 20 kilometres from the Indian border.

Senior officials from the Airports Authority of India (AAI) visited Kailashahar Airport in Tripura's Unakoti district on May 26 to assess infrastructure, land availability and visibility conditions, as reported by PTI. The site visit marked the first concrete step in restarting operations at the airfield, which has remained non-operational for over three decades.

Why is Kailashahar back in focus?

The renewed interest in Kailashahar comes amid growing unease in New Delhi over the potential strategic implications of the Chinese-backed upgrade of Lalmonirhat airbase in northern Bangladesh. The site lies in close proximity to the Siliguri Corridor, a narrow, 22-kilometre stretch of land that connects mainland India to its northeastern states. Often referred to as the "chicken's neck," the corridor is widely recognised as a critical vulnerability in India's territorial integrity.

Close proximity of Lalmonirhat airfield to Indian border

The Lalmonirhat airfield, once used during World War II, is reportedly being developed with Chinese support. While few details are publicly available, India is viewing the project as part of a broader pattern of deepening China-Bangladesh defence ties.

In contrast, India's revival of Kailashahar airport carries both historical significance and strategic weight. During the 1971 Indo-Pak war, the airport served as a launchpad for the Indian Air Force and the fledgling Bangladeshi resistance.

It was from this airfield that the first missions of 'Kilo Flight', the nucleus of what would later become the Bangladesh Air Force, were launched, using civilian aircraft retrofitted for combat and reconnaissance missions.

Tripura currently relies on a single major airport at Agartala. Recommissioning Kailashahar Airport will not only strengthen regional connectivity but also enhance logistical preparedness in a sensitive frontier region.

It can serve as a dual-purpose initiative, boosting civilian air travel while enabling quicker mobilisation of resources, if required. India has so far refrained from making any official comment on China's reported involvement in the Lalmonirhat airbase.

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India's alarm over Chinese spying rocks the surveillance industry

Source: The Economic times, Dt. 28 May 2025,
URL: https://economictimes.indiatimes.com/news/defence/indias-alarm-over-chinese-spying-rocks-the-surveillance-industry/articleshow/121453944.cms

Global makers of surveillance gear have clashed with Indian regulators in recent weeks over contentious new security rules that require manufacturers of CCTV cameras to submit hardware, software and source code for assessment in government labs, official documents and company emails show. The security-testing policy has sparked industry warnings of supply disruptions and added to a string of disputes between Prime Minister Narendra Modi's administration and foreign companies over regulatory issues and what some perceive as protectionism.

New Delhi's approach is driven in part by its alarm about China's sophisticated surveillance capabilities, according to a top Indian official involved in the policymaking. In 2021, Modi's then-junior IT minister told parliament that 1 million cameras in government institutions were from Chinese companies and there were vulnerabilities with video data transferred to servers abroad.

Under the new requirements applicable from April, manufacturers such as China's Hikvision, Xiaomi and Dahua, South Korea's Hanwha, and Motorola Solutions of the U.S. must submit cameras for testing by Indian government labs before they can sell them in the world's most populous nation. The policy applies to all internet-connected CCTV models made or imported since April 9.

"There's always an espionage risk," Gulshan Rai, India's cybersecurity chief from 2015 to 2019, told Reuters. "Anyone can operate and control internet-connected CCTV cameras sitting in an adverse location. They need to be robust and secure."

Indian officials met on April 3 with executives of 17 foreign and domestic makers of surveillance gear, including Hanwha, Motorola, Bosch, Honeywell and Xiaomi, where many of the manufacturers said they weren't ready to meet the certification rules and lobbied unsuccessfully for a delay, according to the official minutes. In rejecting the request, the government said India's policy "addresses a genuine security issue" and must be enforced, the minutes show.

India said in December the CCTV rules, which do not single out any country by name, aimed to "enhance the quality and cybersecurity of surveillance systems in the country."

This report is based on a Reuters review of dozens of documents, including records of meetings and emails between manufacturers and Indian IT ministry officials, and interviews with six people familiar with India's drive to scrutinize the technology. The interactions haven't been previously reported.

Insufficient testing capacity, drawn-out factory inspections and government scrutiny of sensitive source code were among key issues camera makers said had delayed approvals and risked disrupting unspecified infrastructure and commercial projects.

"Millions of dollars will be lost from the industry, sending tremors through the market," Ajay Dubey, Hanwha's director for South Asia, told India's IT ministry in an email on April 9. The IT ministry and most of the companies identified by Reuters didn't respond to requests for comment about the discussions and the impact of the testing policy. The ministry told the executives on April 3 that it may consider accrediting more testing labs.

Millions of CCTV cameras have been installed across Indian cities, offices and residential complexes in recent years to enhance security monitoring. New Delhi has more than 250,000 cameras, according to official data, mostly mounted on poles in key locations. The rapid take-up is set to bolster India's surveillance camera market to $7 billion by 2030, from $3.5 billion last year, Counterpoint Research analyst Varun Gupta told Reuters.

China's Hikvision and Dahua account for 30% of the market, while India's CP Plus has a 48% share, Gupta said, adding that some 80% of all CCTV components are from China. Hanwha, Motorola Solutions and Britain's Norden Communication told officials by email in April that just a fraction of the industry's 6,000 camera models had approvals under the new rules.

China Concern

The U.S. in 2022 banned sales of Hikvision and Dahua equipment, citing national security risks. Britain and Australia have also restricted China-made devices. Likewise, with CCTV cameras, India "has to ensure there are checks on what is used in these devices, what chips are going in," the senior Indian official told Reuters. "China is part of the concern."

China's state security laws require organizations to cooperate with intelligence work. Reuters reported this month that unexplained communications equipment had been found in some Chinese solar power inverters by U.S. experts who examined the products. Since 2020, when Indian and Chinese forces clashed at their border, India has banned dozens of Chinese-owned apps, including TikTok, on national security grounds. India also tightened foreign investment rules for countries with which it shares a land border. The remote detonation of pagers in Lebanon last year, which Reuters reported was executed by Israeli operatives targeting Hezbollah, further galvanized Indian concerns about the potential abuse of tech devices and the need to quickly enforce testing of CCTV equipment, the senior Indian official said.

The camera-testing rules don't contain a clause about land borders. But last month, China's Xiaomi said that when it applied for testing of CCTV devices, Indian officials told the company the assessment couldn't proceed because "internal guidelines" required Xiaomi to supply more registration details of two of its China-based contract manufacturers.

"The testing lab indicated that this requirement applies to applications originating from countries that share a land border with India," the company wrote in an April 24 email to the Indian agency that oversees lab testing. Xiaomi didn't respond to Reuters queries, and the IT ministry didn't address questions about the company's account.

China's foreign ministry told Reuters it opposes the "generalization of the concept of national security to smear and suppress Chinese companies," and hoped India would provide a non-discriminatory environment for Chinese firms.

Lab Testing, Factory Visits

While CCTV equipment supplied to India's government has had to undergo testing since June 2024, the widening of the rules to all devices has raised the stakes. The public sector accounts for 27% of CCTV demand in India, and enterprise clients, industry, hospitality firms and homes the remaining 73%, according to Counterpoint.

The rules require CCTV cameras to have tamper-proof enclosures, strong malware detection and encryption. Companies need to run software tools to test source code and provide reports to government labs, two camera industry executives said.

The rules allow labs to ask for source code if companies are using proprietary communication protocols in devices, rather than standard ones like Wi-Fi. They also enable Indian officials to visit device makers abroad and inspect facilities for cyber vulnerabilities. The Indian unit of China's Infinova told IT ministry officials last month the requirements were creating challenges.

"Expectations such as source code sharing, retesting post firmware upgrades, and multiple factory audits significantly impact internal timelines," Infinova sales executive Sumeet Chanana said in an email on April 10. Infinova didn't respond to Reuters questions.

The same day, Sanjeev Gulati, India director for Taiwan-based Vivotek, warned Indian officials that "All ongoing projects will go on halt." He told Reuters this month that Vivotek had submitted product applications and hoped "to get clearance soon."

The body that examines surveillance gear is India's Standardization Testing and Quality Certification Directorate, which comes under the IT ministry. The agency has 15 labs that can review 28 applications concurrently, according to data on its website that was removed after Reuters sent questions. Each application can include up to 10 models.

As of May 28, 342 applications for hundreds of models from various manufacturers were pending, official data showed. Of those, 237 were classified as new, with 142 lodged since the April 9 deadline. Testing had been completed on 35 of those applications, including just one from a foreign company.

India's CP Plus told Reuters it had received clearance for its flagship cameras but several more models were awaiting certification. Bosch said it too had submitted devices for testing, but asked that Indian authorities "allow business continuity" for those products until the process is completed.

When Reuters visited New Delhi's bustling Nehru Place electronics market last week, shelves were stacked with popular CCTV cameras from Hikvision, Dahua and CP Plus. But Sagar Sharma said revenue at his CCTV retail shop had plunged about 50% this month from April because of the slow pace of government approvals for security cameras. "It is not possible right now to cater to big orders," he said. "We have to survive with the stock we have."

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Operation Sindoor: BSF targeted 76 Pak posts, 42 FDLs, destroyed three terror launch pads in retaliatory action

Source: The Economic Times, Dt. 27 May 2025,
URL: https://economictimes.indiatimes.com/news/defence/bsf-carried-out-planned-attack-on-let-launchpad-just-3-km-from-loc-after-cross-border-shelling-from-pak-ig/articleshow/121431309.cms

The Border Security Force on Tuesday said it targeted 76 Pakistani border outposts and 42 forward defence locations (FDLs) and destroyed three terrorist launch pads in strong retaliation to unprovoked firing and shelling by Pakistani Rangers along the International Border (IB) in the Jammu frontier during Operation Sindoor. The BSF action came after Pakistan launched heavy firing and shelling on 60 Indian posts and 49 forward positions, reportedly providing cover for an attempted infiltration by 40–50 terrorists, officials said.

"Pakistan fired on our 60 border outposts and 49 forward defence locations. In response, we opened fire on 76 of their posts and 42 FDLs," BSF Deputy Inspector General (DIG) Chiterpaul Singh told reporters here. Singh said a key terror launch pad run by Pakistan's Inter-Services Intelligence (ISI) near the Sunderbani sector was destroyed. "There is no movement seen from that area now," he said.

Inspector General of BSF, Jammu Frontier, Shashank Anand said intelligence inputs confirmed that multiple launch pads were hit, and there were several fatalities among terrorists and Pakistani Rangers during precision strikes. "A Lashkar-e-Taiba launch pad opposite the 'chicken neck' area was neutralised on the night of May 9–10 using a special weapon system," the IG said, adding three launch pads in Loni, Mastpur, and Chabbra were destroyed.

"We are still assessing the total damage in coordination with our partner agencies. Three launch pads and several posts were destroyed. Many Pakistani villages were vacated by Rangers," he said. Following the April 22 Pahalgam attack, he said, BSF and Army troops were deployed across sensitive regions including Rajouri and Poonch, while the border force strengthened its forward presence in Jammu, Samba, and Kathua.

"After April 22, Pakistani Rangers reduced their visibility at forward posts, but BSF maintained aggressive field domination. Our troops, including women personnel, stood firm and ready for eventuality," Anand said. DIG Indreshwar said that on the night of May 8, BSF's surveillance systems detected the movement of a group of 40–50 terrorists near Sialkot. "We launched a preemptive strike in the Samba region to foil their infiltration attempt," he said.

Describing the Pakistan Rangers' reaction as "unexpected from soldiers," the DIG said, "They fled their posts. They were not prepared for such a strong response. But we expect that they will restore their terror infrastructure in the future." The IG said a demoralised enemy responded with shelling in the Akhnoor sector the next night, prompting BSF retaliation. "On the night of May 9 and 10, we targeted Lashkar-e-Taiba launch pads and destroyed one just three kilometres from the border." DIG Virendra Datta from Sunderbani said the BSF received intelligence about 18–20 terrorists

planning infiltration. "We responded with a strategic mortar offensive, surrounding enemy posts. Several Pakistani positions were destroyed," he said.

The IG also praised BSF women personnel for their courage. "Our women troops had the option to relocate to battalion headquarters, but they chose to remain at forward posts. Assistant Commandant Neha Bhandari and other women constables engaged enemy fire with bravery," the IG said. The IG confirmed the use of drones by Pakistan for low-altitude attacks. "On the morning of May 10, Pakistan deployed low-flying drones targeting our posts. Our troops engaged them, but one drone dropped its payload on a post, leading to the martyrdom of two BSF personnel and one Army jawan," he said.

In retaliation, the BSF launched a massive counter-offensive targeting Pakistani bunkers, surveillance equipment and communication towers in the Sialkot region, he said. "To honour our martyrs, we will name two posts after them. A post in Samba will be named 'Sindoor'," the IG said. On reports of white flags across the border, the IG said, "There has been communication at the DGMO level. No communication was made at the lower level. We are watching their actions closely. Any decision will be based on their future conduct."

He stressed the importance of agency coordination and said, "All security agencies, BSF, Army, paramilitary, and J&K Police, are working together. Intelligence-sharing is regular and robust." The IG highlighted BSF's legacy of valour. "From the 1965 war to Operation Parakram and Kargil, the BSF has stood at the front. In Operation Sindoor, we inflicted substantial damage on the enemy while protecting our assets and civilians," he said.

"Our field domination strategy remains aggressive. Even when Pakistan Rangers withdrew, BSF held the line-side by side, men and women, defending the border." The Border Security Force inflicted heavy damage on terrorist infrastructure and Pakistani positions along the IB during Operation Sindoor, launched after the April 22 Pahalgam terror attack, the Inspector General said. "All these valiant tales of bravery are linked to the sacrifices of our soldiers and warriors," the IG said, noting the BSF's vital role in the Bangladesh war, Kargil and Operation Parakram. "Now, during Operation Sindoor, we have inflicted substantial damage on the enemy with immense bravery," he said.

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CIBMS delivered encouraging results along IB: Inspector General of Border Security Force

Source: The Economic Times, Dt. 27 May 2025,
URL: https://economictimes.indiatimes.com/news/defence/cibms-delivered-encouraging-results-along-ib-inspector-general-of-border-security-force/articleshow/121441804.cms

The comprehensive integrated border management system (CIBMS) is transforming surveillance along the Jammu frontier, allowing real-time monitoring even in the most difficult terrains, a senior BSF official said on Tuesday. Inspector General of Border Security Force (BSF) Shashank Anand said a pilot project was launched back in 2017-18 and it has delivered encouraging results.

He was replying to a question about the update of the smart fencing project implemented along the international border (IB) in the Jammu frontier. "Significant technological infusion is expected to take place soon. It is our endeavour to bring every inch of the International Border under this system," Anand added.

The IG said that when the Union Home Minister visited a forward post along the border in April, the BSF presented a live demonstration of the system, showcasing its capabilities. Calling Jammu a "priority area" for the government, the senior BSF officer said the system allows the force to monitor "every activity, both across the border and behind it in real time." The smart fencing projects developed under CIBMS are the first of their kind in the country. Two such pilot projects, each covering a 5.5 km stretch of the border, have been implemented along sensitive patches of the International Border in Jammu, officials said.

The projects are equipped with a high-tech surveillance network that forms an invisible electronic barrier-on land, water, air, and even underground, they said. Officials said the system is designed for stretches where traditional patrolling is impossible due to tough terrain or riverine gaps. "It includes an array of advanced sensors such as thermal imagers, underground sensors (UGS), fibre-optic sensors, radar and sonar, deployed on aerostats, towers, and poles", officials said.

"These sensors are integrated with advanced communication and data processing systems. "The signals are transmitted to a Unified Command and Control Centre, enabling real-time monitoring 24x7 under all weather conditions-whether in dust storms, fog, or rain," a senior officer said. The CIBMS project represents a strategic push to modernise border security by replacing manual patrolling with smart surveillance solutions in high-risk areas.

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BSF demonstrates anti-material rifle 'Vidhwansak', other weapons used in Operation Sindoor

Source: The Economic Times, Dt. 27 May 2025,
URL: https://economictimes.indiatimes.com/news/defence/bsf-demonstrates-anti-material-rifle-vidhwansak-other-weapons-used-in-operation-sindoor/articleshow/121441563.cms

The Border Security Force (BSF) on Monday showcased a range of weapons, including the 'Vidhwansak' anti-material rifle, which was used during Operation Sindoor to target Pakistposts. The demonstration was held during a weapon exhibition at the BSF Frontier Headquarters in Jammu.

The visuals from the event showed BSF personnel demonstrating the use of the anti-material rifle (AMR), the automatic grenade launcher system, and other heavy weaponry. BSF official Rakesh Kaushik said that the Vidhvansak has a range of 1800 m and 1300 m. The barrels, bolts and magazines are changed as per the need. One magazine has three rounds. It destroys the enemy's pillboxes, bunkers and armed cars. It is made in India and destroyed all the given targets during Operation Sindoor.

A BSF officer said that the medium machine gun is operated by three personnel. This was used by the BSF to counter Pakistan's attacks during Operation Sindoor. He added that Pakistan's observation outpost was destroyed using Vidhwansak.

He added, "It fires at 650-1000 rounds per minute and can even stop the flowing water with its speed...It has a huge effect. The post within the range of the rifle was also destroyed." BSF officer Ram Niwas said, "This Automatic Grenade System proved a very successful weapon during Operation Sindoor to destroy enemy posts, hideouts and also their bullet-proof vehicles. Its range is 1700-2100 meters. The grenade fired from it has a killing area of 10 meters. Its fire is very effective." BSF official Ravi Kant talked about the 12.7 mm anti-craft gun and said that it is a belt-loaded crew weapon, operated by three soldiers. It has a range of two kilometres. It is useful in destroying the enemy's cars and tanks. He said, "Operation Sindoor went well; whoever came in front of us was destroyed. He added that the gun forced the enemy to leave their BOP (Border Outpost)."

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India, Pakistan discuss border issues in DGMO talks

Source: The Times of India, Dt. 28 May 2025,
URL: https://timesofindia.indiatimes.com/india/india-pakistan-discuss-border-issues-in-dgmo-talks/articleshow/121449389.cms

India and Pakistan on Tuesday conducted their weekly talks through the hotline between the offices of the rival DGMOs, during which "border management issues" were discussed in line with the ongoing truce along the border. "They were routine talks that take place between middle-rung officers through the DGMO hotline every Tuesday," an officer said.

The two armies are discussing "measures to ensure troop reduction from the borders and forward areas" after Indian DGMO Lt-General Rajiv Ghai and his Pakistani counterpart Major General Kashif Abdullah reached the understanding on May 10 to cease cross-border hostilities which had started on May 7. The two sides are also continuing with their confidence building measures to progressively reduce the "high alertness levels" between the rival militaries to ensure that neither side "fires or initiates any aggressive and inimical action", as reported by TOI earlier.

India has repeatedly stressed that the ongoing understanding, which came into effect at 5 pm on May 10 after India's deep precision strikes on nine Pakistani airbases as well as a few radar sites earlier that day, is conditional and depends on Islamabad's behaviour. "If Pakistan's behaviour improves, it is fine. But if there is any disturbance, harshest punishment will be given," defence minister Rajnath Singh had said. In the aftermath of the Pahalgam terror attack, Pakistan had moved several reserve army formations, tanks and Chinese-made SH-15 self-propelled 155mm howitzers closer to the Line of Control as well as the international border.

India had further carried out some forward deployments, which included the multi-layered air defence network that eventually thwarted the waves of drones and some missiles unleashed by Pakistan against Indian civilian and military targets.

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What US intelligence reveals about India's enemies

Source: The Economic Times, Dt. 27 May 2025,
URL: https://economictimes.indiatimes.com/news/defence/what-us-intelligence-reveals-about-indias-enemies-pakistan-china-after-operation-sindoor/articleshow/121435272.cms

India's two adversaries, Pakistan and China, are modernising their militaries. While China is focused on expanding its global military footprint posing “a most comprehensive military threat” to the US, Pakistan is trying to sharpen its nuclear strategy to offset India's conventional military edge. This is what a US intelligence assessment report titled '2025 World Threat Assessment' has revealed.

Written after Operation Sindoor, the report talks about India's defence priorities. "Indian Prime Minister Narendra Modi’s defense priorities will probably focus on demonstrating global leadership, countering China, and enhancing New Delhi's military power. India views China as its primary adversary and Pakistan more an ancillary security problem to be managed, despite cross-border attacks in mid-May by both India’s and Pakistan’s militaries," the report says. Following are excerpts from the report on Pakistan and China:

What US intelligence says about Pakistan

During the next year, the Pakistani military’s top priorities are likely to remain cross-border skirmishes with regional neighbors, rising attacks by Tehrik-e Taliban Pakistan and Baloch nationalist militants, counterterrorism efforts, and nuclear modernization. Despite Pakistan’s daily operations during the past year, militants killed more than 2,500 people in Pakistan in 2024. Pakistan regards India as an existential threat and will continue to pursue its military modernization effort, including the development of battlefield nuclear weapons, to offset India’s conventional military advantage.

Pakistan is modernizing its nuclear arsenal and maintaining the security of its nuclear materials and nuclear command and control. Pakistan almost certainly procures WMD-applicable goods from foreign suppliers and intermediaries. » Pakistan primarily is a recipient of China’s economic and military largesse, and Pakistani forces conduct multiple combined military exercises every year with China’s PLA, including a new air exercise completed in November 2024. Foreign materials and technology supporting Pakistan’s WMD programs are very likely acquired primarily from suppliers in China, and sometimes are transshipped through Hong Kong, Singapore, Turkey, and the United Arab Emirates. However, terrorist attacks targeting Chinese workers who support China-Pakistan Economic Corridor projects have emerged as a point of friction between the countries; seven Chinese nationals were killed in Pakistan in 2024.

What US intelligence says about China

China maintains its strategic objectives to be the preeminent power in East Asia, challenge the United States for global leadership, unify Taiwan with mainland China, advance the development and resiliency of China’s economy, and become technologically self-sufficient by mid-century. China is rapidly advancing its military modernization and developing capabilities across all

warfare domains that could enable it to seize Taiwan by force, to better project power in the western Pacific, and to disrupt U.S. attempts to maintain presence or intervene in conflict in the Indo-Pacific region.

President Xi continues to publicly express concern about disloyalty and corruption in the PLA's ranks, and in 2024 a long-serving admiral in charge of enforcing loyalty and ideological compliance across the PLA was removed and investigated for corruption. The dismissal resembles the abrupt removal in 2023 of China's defense minister and senior PLA Rocket Force officers, reportedly because of corruption surrounding weapons procurement and nuclear modernization. In mid-March, press outlets identified a vice-chairman of China's Military Commission—Gen He Weidong—as another senior target of anti-corruption investigations. China's nuclear warhead stockpile probably has surpassed 600 operational nuclear warheads. We estimate that China will have more than 1,000 operational nuclear warheads by 2030—much of which will be deployed at higher readiness levels for faster response times.

China's space-related activities aim to erode U.S. space superiority and exploit a perceived U.S. reliance on space-based systems to deter and counter intervention in a regional military conflict. China is investing in space systems that enhance its own Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance, Reconnaissance, and Targeting (C5ISRT) capabilities. China will continue to launch a variety of satellites that substantially enhance its intelligence, surveillance, and reconnaissance (ISR) capabilities; field advanced communications satellites able to transmit large amounts of data; improve its space-based positioning, navigation, and timing capabilities; and deploy new weather and oceanographic satellites.

China is improving PLA systems to operate further from China for longer periods and establishing a more robust overseas logistics and basing infrastructure to sustain deployments at greater distances, efforts that can potentially threaten U.S. global operations or international commerce during a conflict.

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Science & Technology News

India has initiated the process to develop Electric Hansa (E-Hansa), a next-generation two-seater electric trainer aircraft: Dr Jitendra Singh

Source: Press Information Bureau, Dt. 27 May 2025,
URL: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2131668

India has initiated the process to develop Electric Hansa (E-Hansa), a next-generation two-seater electric trainer aircraft. This was disclosed here today by Dr Jitendra Singh, Union Minister of State (Independent Charge) for Science & Technology, while chairing a high-level monthly review meeting with the secretaries of all major science departments at the Science Centre here.

In his capacity as Vice President of CSIR (Council of Scientific & Industrial Research), Dr Jitendra Singh said, it is a matter of pride that the new aircraft is being indigenously developed by the CSIR institute of "National Aerospace Laboratories" (NAL) Bengaluru.

The Electric Hansa (E-HANSA) trainer aircraft, developed by CSIR-NAL, is expected to cost significantly less than imported alternatives, possibly around Rs 2 crore. This is roughly half the price of a comparable imported trainer aircraft. The E-HANSA is part of the larger HANSA-3 (NG) trainer aircraft program, which is designed to be a cost-effective and indigenous option for pilot training in India.

India's E-Hansa aircraft will also mark a key step toward India's green aviation goals and use of green or clean energy fuel in running our aircrafts, said the Minister. Further, the meeting focused on performance assessment, implementation status of prior decisions, and setting the course for transformative reforms in India's science and technology ecosystem.

Stressing the need for commercialization of indigenous technologies, Dr. Jitendra Singh called for greater public-private partnerships (PPP). He directed the National Research Development Corporation (NRDC) to emulate the successful models of DBT-BIRAC and IN-SPACe for technology transfer and private sector engagement.

Dr. Jitendra Singh, Union Minister of State (Independent Charge) for Science and Technology, Minister of State (Independent Charge) for Earth Sciences, MoS PMO, Department of Atomic Energy and Department of Space, MoS Personnel, Public Grievances and Pensions said "Private players should not just be knowledge partners, but also investment partners," advocating a hub-and-spoke PPP model supported by AI-driven tech/IP exchange platforms and regional NTTOs to ensure wider sectoral and geographic outreach. Dr. Jitendra Singh reiterated the importance of standardized tech transfer protocols, ease of doing business, and promoting Indian R&D under the ethos of "Vasudhaiva Kutumbakam".

Commending ISRO for the successful SPADEX mission, he noted that the docking and undocking capability tested is vital to India's upcoming Gaganyaan human spaceflight. He also lauded ISRO's substantial role in Operation Sindoor, stating, "Every Indian is proud of you." He shared that ISRO is currently collaborating with 40 Union Ministries and 28 State Governments, with a series of upcoming missions lined up. Regarding India's contribution to the Axiom Space Mission, Dr. Jitendra Singh informed that Group Captain Subhash Shukla's visit to the International Space Station (ISS) will include seven microgravity experiments, further boosting India's space science profile.

In alignment with Prime Minister Narendra Narendra Modi's 'Viksit Bharat' vision, Dr. Jitendra Singh emphasized a Whole-of-Science and Whole-of-Government approach. Following the success of the Chintan Shivir organized by the Ministry of Earth Sciences in NIOT, Chennai, he directed that region-wise Chintan Shivirs be organized across the country. These will include DST, DBT, CSIR, ISRO, Earth Sciences, and Atomic Energy departments in each region to promote integrated planning and synergy.

To strengthen India's biomanufacturing capabilities, the Minister proposed the creation of a "Global Science Talent Bridge" to attract the best global researchers and innovators. Highlighting

the PM's Mann Ki Baat announcement that opened all 37 CSIR labs to students, he shared that an enthusiastic response had to be temporarily paused due to recent security concerns but would resume soon. Dr. Jitendra Singh also acknowledged global interest in setting up bilateral science collaboration centres, with countries like Switzerland and Italy exploring partnerships similar to the Indo-French and Indo-German Science Centres.

The meeting was attended by prominent officials including Prof. Ajay Kumar Sood, Principal Scientific Advisor to the Government of India; Dr. N. Kalaiselvi, DG and Secretary CSIR; Dr. V. Narayanan, Chairman ISRO and Secretary DoS; Dr. Abhay Karandikar, Secretary DST; Dr. Rajesh Gokhale, Secretary DBT; Dr. M. Ravichandran, Secretary Earth Sciences; Dr. M. Mohapatra, DG IMD; and Commodore Amit Rastogi (Retd), CMD NRDC, along with senior officials from the Department of Atomic Energy.

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Kashmir university researchers produce India's first gene-edited sheep: 'Birth of a new era'

Source: The Indian Express, Dt. 28 May 2025,
URL: https://indianexpress.com/article/india/kashmir-university-researchers-india-first-gene-edited-sheep-10032451/

The gene-editing of the sheep was possible after four years of research and will enhance the muscle mass of the animal by 30%, the researchers said. A team of researchers from the Sher-e-Kashmir University of Agricultural Sciences (SKUAST) in Srinagar has produced India's first gene-edited sheep. The gene-editing of the sheep was possible after four years of research and will enhance the muscle mass of the animal by 30%, the researchers said. The breakthrough comes after the release of India's first gene-edited rice variety recently.

"As of now, this has been done at the research level," said Prof Riaz Ahmad Shah, who led a team of five researchers at SKUAST. "The technique has multiple applications. We can edit the genes responsible for diseases to produce disease-resistant animals. It can also help in the twinning of animals at birth," he said.

The team of researchers edited the myostatin gene of the lamb that is responsible for regulating the growth of muscle in the sheep. "By disrupting the sheep, the muscle mass in the animal is enhanced by nearly 30%, a trait naturally absent in Indian sheep breeds but known in select European breeds like the Texel," Prof Shah said. "The introduction of this mutation through gene editing, and not through traditional crossbreeding, represents a technological leap."

The team of researchers edited the myostatin gene of the lamb that is responsible for regulating the growth of muscle in the sheep. Earlier, a team of researchers at the National Dairy Research Institute (NDRI) had developed a gene-edited embryo of a buffalo. "This is not just the birth of a lamb, but the birth of a new era in livestock genetics in India," said Dr Nazir Ahmad Ganai, vice chancellor of SKUAST-Kashmir. "With gene editing, we have the ability to bring precise, beneficial changes without introducing foreign DNA, making the process efficient, safe, and

potentially acceptable to both regulators and consumers." The project was sponsored by the Indian Council of Agricultural Research (ICAR).

Shah said, "The gene editing was performed using CRISPR-Cas9 technology and adhered to international biosafety protocols." The gene-editing technique, CRISPR, won the 2020 Nobel Prize in Chemistry. "The edited sheep doesn't contain any foreign DNA, thus distinguishing it from transgenic organisms. This can pave the way for regulatory approval under India's evolving biotech policy framework," he said.

A veteran scientist, Shah is also credited with the development of the first cloned Pashmina goat, Noori, in 2012. The Pashmina goat survived for 11 years and produced seven kids. With a specialisation in Animal Cloning and Gene Editing, Shah has also played a key role in producing the world's first cloned buffalo at NDRI, Karnal. "The government is already in the process of making regulations for gene-edited animals. Once that is done, and it is allowed at the farmer level, it will have a widespread application," he said.

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China builds 'spy' laser that can read text smaller than a grain of rice from a mile away

Source: The Times of India, Dt. 27 May 2025,
URL: https://timesofindia.indiatimes.com/science/china-builds-laser-that-can-read-text-smaller-than-a-grain-of-rice-from-a-mile-away/articleshow/121431365.cms

In a breakthrough that blurs the line between science fiction and reality, Chinese scientists have unveiled a powerful laser-based imaging system capable of reading text as small as one millimetre, smaller than a grain of rice, from nearly 1.4 kilometres (about a mile) away. Using a technique called active intensity interferometry, the system overcomes common challenges like atmospheric distortion and poor resolution over long distances. This innovation could reshape fields ranging from archaeology to wildlife monitoring and security. However, the technology also raises new concerns around privacy, surveillance, and ethical use.

How the 'spy' laser works to read text from a mile away

Traditional telescopes and long-range lenses often struggle to detect fine details over long distances due to atmospheric interference and diffraction limits. The Chinese research team bypassed these issues by focusing not on capturing an image directly but on analysing the way light interacts with surfaces. Their approach, called active intensity interferometry, uses laser beams and measures the light pattern that bounces back from a target. This allows them to reconstruct high-resolution images of extremely small features.

Why this is a major leap in resolution

The laser system achieved a 14-fold improvement in resolution compared to what a single telescope could capture at the same distance. While standard systems at a mile's range can only make out objects around 42 millimetres in size, this new laser can accurately resolve millimetre-

scale text. That level of precision means it can read markings, labels, or carvings that were previously invisible from such distances.

Limitations and challenges

Despite its impressive capabilities, the system comes with several limitations. For the laser to function effectively, it needs a clear line of sight to the target and cannot operate in complete stealth mode, as the target must be actively illuminated with laser light. This makes it unsuitable for certain surveillance or military operations that require secrecy. Moreover, atmospheric conditions such as dust or fog could impact performance.

Potential applications beyond surveillance

While some may worry about the system being used for spying, the researchers suggest more constructive applications. Archaeologists could use the laser to read ancient inscriptions on cliffs without scaling dangerous heights. Environmental scientists might observe hard-to-reach habitats without disturbing the ecosystem. Infrastructure inspectors could scan for micro-cracks or surface markings on remote structures.

What's next for the technology

The research team plans to improve the system's ease of use by developing more precise laser controls. They are also working on integrating artificial intelligence into the reconstruction process, which could allow for faster, more accurate image rendering in real-time. If successful, this technology could become a standard tool for high-resolution imaging across multiple disciplines.

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Scientists discover bacteria that 'breathe' electricity instead of oxygen

Source: The Times of India, Dt. 27 May 2025,
URL: https://timesofindia.indiatimes.com/science/scientists-discover-bacteria-that-breathe-electricity-instead-of-oxygen/articleshow/121419822.cms

In a groundbreaking discovery, scientists from Rice University have found a type of bacteria that can survive by releasing electricity instead of relying on oxygen. These microorganisms use a natural process to transfer electrons outside their cells, enabling them to generate energy in oxygen-free environments such as deep-sea vents or the human gut. The finding uncovers a previously hidden survival mechanism in nature and holds significant promise for clean energy, biotechnology, and environmental monitoring. The study offers new insight into how ancient life forms adapted to extreme conditions and how we might use them for future technologies. Life can generate power without oxygen through nature's hidden tools. This discovery bridges ancient biology with modern energy solutions.

How the bacteria survive without oxygen

Most living organisms, including humans and animals, use oxygen to help convert food into energy. This process involves passing electrons to oxygen molecules inside cells. However, these newly studied bacteria do something different. Instead of passing electrons to oxygen, they send them directly out of their cells onto surrounding surfaces. This process is known as extracellular respiration and allows the bacteria to thrive in environments with no oxygen.

The role of natural compounds in electricity release

The bacteria achieve this electrical breathing using natural molecules called naphthoquinones. These act like small couriers, picking up electrons from inside the bacterial cell and carrying them to the outside. Once outside, the electrons are released onto nearby conductive materials, much like a battery discharges its stored energy. This simple but effective process helps the bacteria break down food and generate energy without needing oxygen. Naphthoquinones are nature's tiny conductors powering bacterial life. Bacteria act like living batteries through efficient electron transport.

Laboratory experiments and computer modelling

To understand this process better, the Rice team collaborated with researchers at the University of California, San Diego. They used advanced computer models to simulate bacterial life in oxygen-free environments. The results showed that the bacteria could continue to grow and generate electricity when placed on conductive surfaces. These findings were then confirmed in real laboratory conditions, where the bacteria successfully survived and discharged electricity in a controlled setting.

Potential applications in clean technology

This discovery could lead to major advances in sustainable technologies. In processes like wastewater treatment and industrial biomanufacturing, maintaining a balance of electrons is essential for efficiency. These electricity-releasing bacteria could help stabilise such systems by managing electron flow more effectively. Additionally, they could be used to capture and convert carbon dioxide using renewable electricity, similar to how plants use sunlight for photosynthesis.

Future uses in sensors and space exploration

Because these bacteria can function in environments without oxygen, they offer exciting possibilities for developing bioelectronic sensors. Such sensors could be useful in medical diagnostics, pollution detection, and even in deep-space missions where oxygen is scarce. By linking biology and electronics, this research paves the way for innovative technologies that can operate under extreme conditions.

The bottom line

This remarkable discovery reshapes our understanding of how life can exist in harsh environments and offers promising solutions to some of today's biggest technological challenges. With further research, these electricity-breathing bacteria could become key players in the development of cleaner, smarter, and more sustainable systems around the world.

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