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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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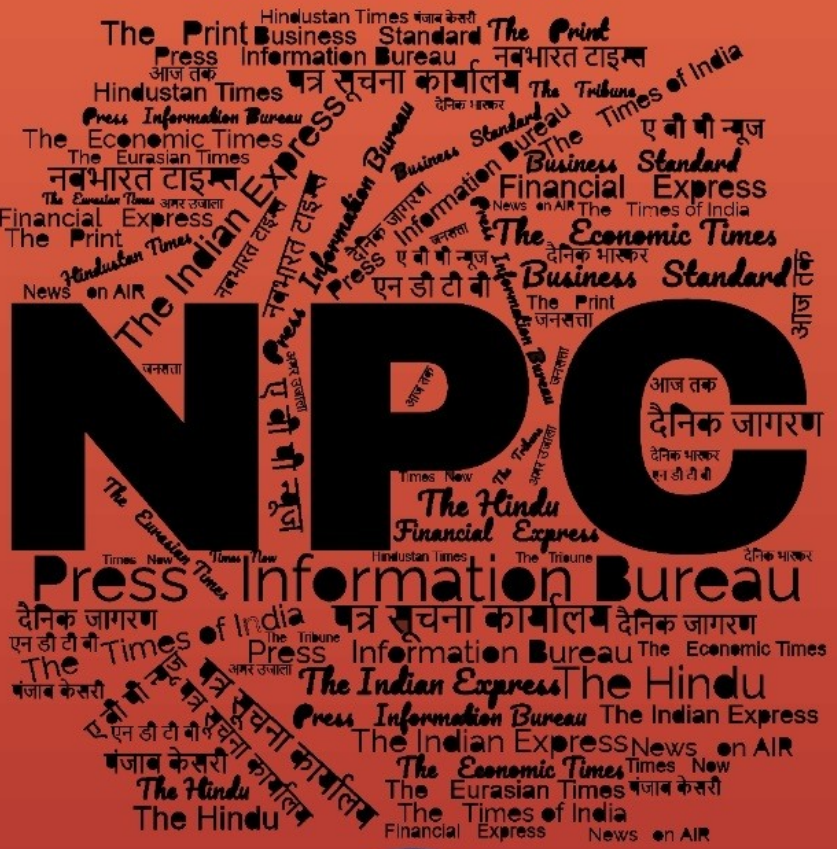

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DRDO News

DRDO Pune lab developing humanoid robot for military operations

Source: The Times of India, Dt. 10 May 2025,
URL: https://timesofindia.indiatimes.com/city/pune/drdo-pune-lab-developing-humanoid-robot-for-military-operations/articleshow/121038796.cms

A team of scientists from the Research and Development Establishment (Engineers) of the DRDO is developing a humanoid robot for various defence applications essential for operational purposes.

This robot, designed to operate under human command, aims to participate in high-risk military operations, thereby reducing soldiers' exposure to life-threatening scenarios. The robot was showcased at the three-day national workshop on advanced legged robotics, which began in Pune on Thursday. This is the first time the DRDO has publicly showcased a technological demonstration in this field.

"The humanoid robot consists of a complex operating system that functions through a combination of advanced software and sensors. We have currently developed prototypes for both the lower and upper bodies of the robot and have achieved some applications during our internal testing," SE Talole, Group Director at the Centre for Systems and Technologies for Advanced Robotics of the R&D Establishment (Engineers), told TOI.

The team has been working on the project for the past four years and has completed the initial stages of development. Once fully operational, the humanoid upper body system would have the ability to perform complex autonomous operations with closed-loop gripping. It will also be capable of turning, pushing, pulling or sliding doors, pushing obstacles, opening valves, and operating in high-risk zones. The robot should be able to process and successfully execute commands given by the operator, according to scientists. The functioning of the robot is based on three principles — actuators act as muscles to generate movement, sensors gather information, and control systems process this information.

"The challenging aspects for us are to execute various tasks seamlessly. To achieve that, we need to ensure high-level balancing, information processing, and execution on the ground," said Talole. "Our team is working on achieving these three objectives in the advanced phases of development. Our aim is to complete the task by 2027," said Kiran Akella, a scientist leading the design team.

The legged robots being developed by the DRDO's premier research laboratory in Pune have the potential to be put in use by Indian Armed forces.

Once fully functional, the humanoid upper body system would have a lightweight arm with spherical revolute joint configuration. It would have 24 degrees of freedom, including seven in the arm, four in the gripper, and two in the head.

It has been designed to safely handle hazardous objects such as mines, explosives, and liquids using both arms collaboratively. It can perform operations at day or night, indoors or outdoors. Audiovisual perception, multiple proprioceptive and exteroceptive sensing abilities, data fusion, and tactical sensing would also be available.

The humanoid biped system has been designed to possess stability, control, and balance while navigating unstructured terrain.It would have real-time dynamics and kinematics, besides capabilities for fall and push recovery, and real-time map generation and navigation.

Path planning and simultaneous localization and mapping in unstructured terrain as well as the ability to perform complex autonomous operations in high-risk zones are also features that the humanoid biped system would have.

Private global players have also been developing effective humanoid robots for military purposes, with some countries already in the process of inducting these robots for logistics and other applications.

Legged robotic systems, such as bipedal and quadrupedal robots, have numerous practical applications in various fields, including military and security, medical services, home services, space exploration, and manufacturing. However, the design and development of autonomous legged robots face a variety of technological challenges, an official said.

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IIT BHU: DRDO के प्रतिनिधि करेंगे दौरा, रक्षा तकनीक के 25 प्रोजेक्ट के वैज्ञानिकों से करेंगे वार्ता; जानें खास

Source: Amar Ujala, Dt. 10 May 2025,
URL: https://www.amarujala.com/uttar-pradesh/varanasi/drdo-representatives-will-visit-iit-bhu-will-talk-to-scientists-of-defense-technology-projects-2025-05-09

भारत–पाकिस्तान में बढ़े तनाव के बीच डीआरडीओ और उसके साथ रिसर्च कर रहे संस्थानों की भूमिका काफी अहम हो गई है। आईआईटी–बीएचयू में रक्षा तकनीक से जुड़े डीआरडीओ के 25 प्रोजेक्ट पर रिसर्च किया जा रहा है। डीआरडीओ के प्रतिनिधि बहुत जल्द संस्थान का दौरा करेंगे।

आईआईटी–बीएचयू में चल रहे 25 प्रोजेक्ट में 25 फीसदी से ज्यादा की प्रोग्रेस हुई है। वहीं बचे 75 फीसदी कामों को अगले ढाई–तीन साल में पूरा किया जाएगा। साथ ही इस साल के रिसर्च के लिए डीआरडीओ की ओर से आईआईटी–बीएचयू को 40 करोड़ रुपये का फंड भी दे दिया गया है। मिसाइल, आयुध, माइक्रोवेव वेपंस, पाउडर मैटलर्जी और हथियारों के लिए संस्थान में तकनीक तैयार की जा रही है।

आईआईटी–बीएचयू के निदेशक प्रो. अमित पात्रा गुरुवार को दिल्ली में डीआरडीओ के कार्यक्रम राष्ट्रीय तकनीक दिवस में मुख्य अतिथि बनाए गए थे। इस दौरान वे डीआरडीओ के लैब में भी गए और वहां चल रही वैज्ञानिक गतिविधियों के बारे में जानकारियां ली।

प्रो. पात्रा ने कहा कि डीआरडीओ के साथ मिलकर हम भारत के भविष्य की रक्षा तकनीक काम कर रहे हैं। अगले 5 से 10 साल बाद भारत के डिफेंस सेक्टर की सूरत तैयार की जा रही है। वर्तमान की उठी परिस्थितियों से इस तकनीक और रिसर्च का कोई संबंध नहीं है।

देश की जरूरत और संसाधन उपलब्धता के अनुसार होगा रिसर्च

निदेशक प्रो. पात्रा ने बताया कि डीआरडीओ चीफ डॉ. समीर वी कॉमथ ने कहा है कि जल्द ही डीआरडीओ प्रतिनिधि संस्थान का दौरा करेंगे। रक्षा क्षेत्र में जो भी समस्याएं और चुनौतियां आ रही हैं, उनको आईआईटी–बीएचयू के वैज्ञानिकों से बातचीत कर सुलझा लिया जाएगा।

देश की जरूरतों और संसाधनों की उपलब्धता के अनुसार प्रोजेक्ट को अपडेट भी किया जाएगा। निदेशक प्रो. पात्रा ने दिल्ली में हुए कार्यक्रम में कहा कि किसी भी रिसर्च को व्यवसायिक तौर पर सफल बनाना है तो उसकी पूरी साइकिल को समझकर काम करना होगा। अन्यथा आप ऐसे तो रिसर्च पेपर छाप लो, मगर वो देश के लिए कोई काम नहीं आने वाला।

दुश्मनों के इलेक्ट्रॉनिक उपकरणों को कर सकता है डिसेबल

आईआईटी–बीएचयू में पाउडर मैटलर्जी, इलेक्ट्रॉनिक एंड फंग्शनल मटेरियल और हाई पावर माइक्रोवेव सोर्सेज एंड डिवाइस को विकसित किया जा रहा है। माइक्रोवेव सोर्सेज एंड डिवाइस अमेरिका में विकसित बोइंग चैंप मिसाइल सिस्टम और थॉर टेक्निकल हाई पावर ऑपरेशनल रिसपांडर तकनीक पर आधारित रक्षा उपकरण है। इसकी तरंगें दुश्मन देशों के इलेक्ट्रॉनिक उपकरणों को तरंगों के जरिये डिसेबल कर सकता है। इसे मिलिट्री वाहन के इंजन या फिर लैब में इंस्टॉल कर सकते हैं।

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Man behind Akash explains DRDO invention and how it destroyed Pak drones, missiles

Source: Firstpost, Dt. 13 May 2025,
URL: https://www.firstpost.com/india/man-behind-akash-explains-drdo-invention-and-how-it-destroyed-pak-drones-missiles-13887909.html

The Akash missile defence system was the star of the show in the success of Operation Sindoor. The missile shield system was among the many other made-in-India weapons that were used in the military operation and found a mention in Prime Minister Narendra Modi's address to the nation on Monday.

Akash is the brainchild of Prahlada Ramarao, who celebrated a proud moment after the missile system thwarted Pakistan's air incursions last week, as it launched its offensive following Operation Sindoor of the Indian armed forces.

Ramarao, the then project director of Akash, under the Defence Research and Development Organisation (DRDO, said that the fully-indigenous missile system's credit goes to thousands of scientists who worked tirelessly for 15 years to develop it.

Over 100 terrorists killed, Pak airbases damaged, global message: Why India's Operation Sindoor is a resounding success Over 100 terrorists killed, Pak airbases damaged, global message: Why India's Operation Sindoor is a resounding success

"We started work on this project in 1994 with an initial budget of Rs 300 crore. When you invent something, you fail several times. We also failed. But we learnt from our mistakes. Developing Rajendra, a complex multi-function electronically scanned phased array radar, was the biggest

challenge. But we overcame that challenge after several hits and trials. Later, the project budget was raised to Rs 500 crore," he said.

How was Akash used in Op Sindoor?

The Akash defence system was put to the test for the first time in an active military combat during last week's Operation Sindoor. It was successfully used to counter Pakistani drones and missile attacks.

IAF DGMO Air Marshal AK Bharti spoke of the triumphs of Akash during a press briefing on Monday, asserting that the defence system "stood like a wall" during the operation.

"My eyes welled up when my baby worked so well. It is the happiest day of my life. This is bigger than my Padma award," Ramarao told TOI.

Who is Ramarao?

In the early 1990s, Ramarao was chosen by India's 'Missile Man', Dr. APJ Abdul Kalam, to lead the Akash programme as its youngest project director at the age of 35. At the time, Kalam was heading the Defence Research Laboratory (DRL) in Hyderabad under the DRDO, before going on to serve as the scientific adviser to the defence minister and later becoming the President of India.

However, Akash is just one of his successes. Ramarao has also contributed significantly to the development of 10 different surface-to-air and air-to-air defence systems. He also played a role in the creation of Astra and BrahMos.

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ऑपरेशन सिंदूर में गेम चेंजर साबित हुए स्वदेशी हथियार, पाक के पास नहीं था कोई जवाब- पूर्व DRDO चीफ सतीश रेड्डी

Source: TV9 Bharatvarsh, Dt. 10 May 2025,
URL: https://www.tv9hindi.com/india/brahmos-akash-missile-proved-to-be-effective-accurate-weapon-in-operation-sindoor-says-former-drdo-chief-satheesh-reddy-3285820.html

डीआरडीओ के पूर्व चीफ सतीश रेड्डी ने कहा कि पाकिस्तान के खिलाफ ऑपरेशन सिंदूर में भारत के स्वदेशी हथियार ने महत्वपूर्ण भूमिका निभाई. इसने सैन्य तकनीक में देश की बढ़ती आत्मनिर्भरता को प्रदर्शित किया. उन्होंने कहा कि स्वदेशी हथियार ऑपरेशन सिंदूर में गेम चेंजर साबित हुए.

न्यूज एजेंसी एएनआई से बात करते हुए सतीश रेड्डी ने कहा कि ऑपरेशन सिंदूर में कई स्वदेशी तकनीकों का इस्तेमाल किया गया है. मीडिया रिपोर्ट के मुताबिक, ब्रह्मोस मिसाइल, आकाश मिसाइल, एंटी ड्रोन सिस्टम गेम चेंजर साबित हुई. इन्होंने ऑपरेशन में महत्वपूर्ण भूमिका निभाई. पाकिस्तान के पास भारत के डिफेंस सिस्टम का कोई जवाब नहीं था. भारत की तकनीकी क्षमता दिखाई.

पूर्व डीआरडीओ प्रमुख ने कहा कि ब्रह्मोस मिसाइल, जो एक सुपरसोनिक क्रूज मिसाइल है. बेहद कारगर हथियार साबित हुई है. यह अपनी सटीकता और विश्वसनीयता के लिए जानी जाती है. इन सभी प्रणालियों को स्वदेशी रूप

से विकसित किया गया है. उन्होंने कहा कि यह पहली बार है कि बड़ी संख्या में स्वदेशी हथियारों, रडार और ड्रोन के साथ–साथ विभिन्न स्टार्टअप द्वारा विकसित पेलोड का एक साथ बड़े पैमाने पर इस्तेमाल किया गया है.

आकाश मिसाइल की खासियत

- यह मिसाइल प्रणाली 90% से अधिक स्वदेशी, जो सतह–से–हवा में मार करती है.
- इसे DRDO ने डिजाइन किया है.
- 25–30 किलोमीटर की दूरी तक लक्ष्य को भेदने में सक्षम
- 18–20 किलोमीटर की ऊंचाई तक प्रभावी
- एक साथ कई लक्ष्यों को भेदने में सक्षम
- इसमें लगा रडार सिस्टम सटीकता के साथ लक्ष्य को ट्रैक करता है.
- जमीन, जहाज, और मोबाइल लॉन्चर से लॉन्च किया जा सकता है.
- यह लड़ाकू विमान, हेलीकॉप्टर, ड्रोन, और क्रूज मिसाइल जैसे हवाई खतरों को नष्ट कर सकती है.

ब्रह्मोस मिसाइल की खासियत

- ब्रह्मोस एक सुपरसोनिक क्रूज मिसाइल है
- ब्रह्मोस मिसाइल 2.8 से 3.0 मैक (लगभग 3700 किमी/घंटा) की गति से उड़ान भरती है.
- इसे जमीन, समुद्र, हवा और पनडुब्बी से लॉन्च किया जा सकता है.
- सुखोई–30 MKI जैसे लड़ाकू विमानों से लॉन्च हो सकता है.
- जहाजों, बंकरों और सैन्य ठिकानों को निशाना बना सकती है.
- यह लंबी दूरी तक सटीक हमला कर सकती है.

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Defence News

Defence Strategic: National/International

Second Edition of Tri-Services Future Warfare Course Concludes at Manekshaw Centre, New Delhi

Source: Press Information Bureau, Dt. 09 May 2025,
URL: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2127964

The second edition of the Tri-Services Future Warfare Course (FWC-02), an initiative to prepare India's Armed Forces for next-generation warfare, concluded at the Manekshaw Centre, New

Delhi on May 09, 2025. Conducted over three weeks under the aegis of Headquarters Integrated Defence Staff (HQ IDS) and coordinated by the Centre for Joint Warfare Studies (CENJOWS), the course brought together top military leaders, DRDO scientists, strategic experts, and for the first time, 15 representatives from the private defence industry including startups and MSMEs, marking a significant step towards a 'Whole of Nation Approach' to defence preparedness.

The programme featured specialised modules and domain-specific insights on evolving warfare paradigms, including focused scenario-building exercises and discussions with subject matter experts from India and abroad. A major highlight was the interaction between industry and Armed Forces, enabling private players to gain real-time insight into tri-service operational needs in areas like military AI, autonomous systems, unmanned platforms, cybersecurity and advanced materials.

Building on the momentum of its inaugural edition in September 2024, FWC-02 witnessed expanded participation across all three Services and major defence establishments. The course retained its unique rank-agnostic philosophy, fostering candid cross-rank dialogue among officers ranging from Majors to Major Generals and their equivalents.

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Operation Sindoor not just a military action, but a symbol of India's political, social & strategic willpower: Raksha Mantri

Source: Press Information Bureau, Dt. 11 May 2025,
URL: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2128133

"Operation Sindoor was not just a military action, but a symbol of India's political, social and strategic willpower," said Raksha Mantri Shri Rajnath Singh during his virtual address at the inauguration of BrahMos Integration and Testing Facility Centre in Lucknow, Uttar Pradesh on May 11, 2025. He described the operation as a demonstration of India's strong willpower against terrorism and the capability & determination of the Armed Forces, which ensured justice to the innocent families who lost their loved ones at the hands of anti-India and terrorist organisations on the Indian soil.

Raksha Mantri termed Operation Sindoor as a proof that whenever India acts against terrorism, even the land across the border is not safe for terrorists and their masters. "Through the surgical strikes after the Uri incident, air strikes after Pulwama attack and now multiple strikes after Pahalgam attack, the world has witnessed what India can do if terror attacks are carried out on its soil. Following the policy of zero tolerance against terrorism, Prime Minister Shri Narendra Modi has made it clear that this New India will take effective action against terrorism on both sides of the border," he said.

Shri Rajnath Singh asserted that the operation was launched to destroy terrorist infrastructure in Pakistan and PoK, and innocent civilians were not targeted, however, Pakistan targeted the civilian areas in India and tried to attack temples, gurudwaras and churches. "Our Armed Forces displayed valour & restraint and gave a befitting reply by attacking many military bases of Pakistan. Not only did we take action against military bases adjacent to the border, but the indignation of our

Armed Forces reached even Rawalpindi, where the Pakistani military headquarters are located," he said.

On the BrahMos Integration and Testing Facility Centre, Raksha Mantri said it will strengthen India's efforts towards Aatmanirbharta in defence and contribute to the socio-economic development of the region by generating significant direct & indirect employment. He described the inauguration on National Technology Day as a landmark moment, which reflects India's growing innovative energy and aligns with the rapid global transformation in critical, high end and frontier technologies.

Shri Rajnath Singh called BrahMos as not just one of the world's fastest supersonic cruise missiles, but a message of the strength of the Indian Armed Forces, a message of deterrence to adversaries, and a message of the nation's unwavering commitment to safeguarding its borders. He added that BrahMos is a confluence of top defence technologies of India and Russia.

Quoting the Missile Man of India and former President Dr APJ Abdul Kalam who had said 'Unless India stands up to the world, no one will respect us. In this world, fear has no place, only strength respects strength', Rakha Mantri stated that India is one of the most powerful nations today and the centre will help in further strengthening India's power.

Terming the facility as a matter of pride for the Uttar Pradesh Defence Industrial Corridor (UPDIC), Shri Rajnath Singh stated that it has already created around 500 direct and 1,000 indirect jobs, reflecting the state's growing stature as a defence manufacturing hub. He emphasised that Prime Minister Shri Narendra Modi-led Government's vision of setting-up the corridor rests on its goal of developing the state as the world's top defence production and export destination.

"A total of 180 MoUs have, so far, been signed in UPDIC with a proposed investment of Rs 34,000 crore, and an investment of Rs 4,000 crore has already been made. Major investments have been made in Aircraft manufacturing, UAVs, Drones, Ammunition, Composite & Critical materials, Small Arms, Textile and Parachute etc. The highlight is that the participation of both public sector and the private sectors are being witnessed. In Lucknow itself, titanium and super alloy material plants are being started by PTC Industries Limited. In addition, the foundation of seven additional critical projects is being laid. This would accelerate the pace of India's self-reliance in the defence sector," Raksha Mantri said.

Shri Rajnath Singh reiterated the Government's vision of 'Make-in-India, Make-for-the-World', stressing that self-reliance not only means catering to India's own security needs, but it also envisages making the country a key exporter of defence equipment to the global market. Citing a recent report by the Stockholm International Peace Research Institute, which said that global military expenditure has risen to $2,718 billion in 2024, he stated that such a massive market is an opportunity India must seize. "The launch of the BrahMos facility is a firm stride towards making India a significant player in the world's defence production ecosystem," he said.

Raksha Mantri appreciated the efforts of the Uttar Pradesh government, led by Chief Minister Shri Yogi Adityanath, DRDO scientists, engineers, and other stakeholders for completing the project within 40 months. "Given the current circumstances, it is crucial that we continue to achieve our goals in a time-bound and efficient manner," he said. He credited the state government for creating

a strong development ecosystem and implementing initiatives such as setting-up of UPDIC, establishment of DRDO's Defence Technology & Test Centre in Lucknow and hosting DefExpo in 2020.

Speaking at the inauguration site, UP Chief Minister Shri Yogi Adityanath expressed gratitude to Prime Minister Shri Narendra Modi and Raksha Mantri Shri Rajnath Singh for moving forward with the goal of making Lucknow a defence manufacturing hub. He said the facility in Lucknow will give a fillip to the Make-in-India initiative, Aatmanirbharta and investment in defence manufacturing.

On the state's initiatives to promote defence manufacturing, Shri Yogi Adityanath said the work is proceeding with pace under all the six nodes of the UPDIC. He listed various projects in defence manufacturing that are being established in the state, covering both public and private industries.

The Chief Minister hailed Operation Sindoor as a message to the world that India no longer tolerates terrorism. There can be no solution to terrorism other than being absolutely crushed, he said.

The 200-acre BrahMos Integration and Testing Facility Centre in Lucknow will have integration of Booster subassemblies, Avionics, Propellant, Ramjet engines. The programme center with Design & Administrative blocks are also being planned in the complex.

The approx. Rs 300 crore complex will pave the way for skill development for industry and entrepreneurs in a long way. The entire defence ecosystem of ancillary and sub-assemblies will be developed in the vicinity to support the complex. It will help in a big way in industrialisation and skill development of students of ITI, Supervisors, Engineers. It will ensure that people are not forced to migrate to look for job opportunities.

Brahmos Aerospace has selected 36 trainees for the operation of the facility. Five of these newly selected trainees were felicitated by the UP Chief Minister as part of the inauguration.

Deputy Chief Ministers Shri Keshav Prasad Maurya and Shri Brajesh Pathak, Chief Secretary Shri Manoj Kumar Singh, Secretary, Department of Defence R&D and Chairman DRDO Dr Samir V Kamat, DG Brahmos Dr Jaiteerth R Joshi, public representatives and senior officials of the central & state governments were also present on the occasion.

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Raksha Rajya Mantri Shri Sanjay Seth participates in Victory Day celebrations during his visit to Moscow, Russia

Source: Press Information Bureau, Dt. 10 May 2025,
URL: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2128072

Raksha Rajya Mantri Shri Sanjay Seth participated in Victory Day celebrations during his visit to Russia from May 08 to 09, 2025. The celebrations were organised on May 09, 2025, in Moscow to commemorate 80th anniversary of the victory of Soviet People in the Second World War (1941-45).

Shri Sanjay Seth laid a wreath on the Tomb of the Unknown Soldier and witnessed the Victory Day Parade, along with the distinguished delegates from other countries. The participation of Raksha Rajya Mantri in the Victory Day Parade is the symbol of longstanding special and privileged strategic partnership between India and Russia.

During the visit, Raksha Rajya Mantri called on Russian President Mr Vladimir Putin and extended congratulations for the 80th Victory Day.

A person in suit shaking hands with another person in suitDescription automatically generated

Raksha Rajya Mantri also held a bilateral meeting with the Russian Deputy Defence Minister Colonel General Alexander Fomin and thanked the Government & people of Russia for their support in India's fight against the menace of state-sponsored cross-border terrorism.

The two Ministers also discussed multifaceted military & military – technical cooperation and agreed to further deepen ties within the framework of existent institutional mechanisms. The two sides will continue to hold regular consultations and enhance cooperation in the evolving situation.

Shri Sanjay Seth also interacted with the prominent members of the Indian Community at the Embassy of India, Moscow.

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Operation Sindoor: DGMOs show wreckage of Chinese PL-15 missile, Turkish drones; says layered air defence grid proved impenetrable

Source: The Times of India, Dt. 13 May 2025,
URL: https://timesofindia.indiatimes.com/india/operation-sindoor-dgmos-show-wreckage-of-chinese-pl-15-missile-turkish-drones-says-layered-air-defence-grid-proved-impenetrable/articleshow/121105230.cms

In a joint press briefing, senior officers from the Indian Army, Navy, and Air Force presented key findings and operational highlights of Operation Sindoor, which countered recent Pakistani military action.

The briefing was led by DG Air Operations Air Marshal AK Bharti and DGMO Lieutenant General Rajiv Ghai.

Air Marshal Bharti revealed that Pakistan used advanced weaponry, including the PL-15 air-to-air missile, of Chinese origin, which failed to hit its target. "You can see the pieces of it on the screen," he said, showing debris recovered by Indian forces.

He also showcased wreckage of long-range rockets, loiter munitions, and unmanned aerial systems, including Turkish-origin YIHA and Songar drones, which were brought down by India's air defence systems.

"Our battle-proven systems stood the test of time," Bharti said, highlighting the performance of the indigenous Akash air defence system and the effectiveness of India's counter-UAS technologies.

He credited sustained government investment and policy support over the last decade for India's advanced capabilities.

Lieutenant General Rajiv Ghai struck a confident tone, warning against targeting Indian infrastructure. “Targeting our airfields and logistics is way too tough,” he said. In a metaphor-laden message, he referenced cricket legend Virat Kohli's retirement and an old Ashes proverb: "Ashes to ashes, dust to dust, if Thommo don't get ya, Lillee must." Explaining the analogy, Ghai said, “Even if you crossed all the layers, one of the layers of this grid system will hit you.”

The briefing emphasized that multiple aerial threats were neutralized over the last week, and Indian defences remain on high alert.

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India’s Operation Sindoor gambit exposes Pakistan’s made-in-China shield

Source: The Economic Times, Dt. 12 May 2025,
URL: https://economictimes.indiatimes.com/news/defence/indias-operation-sindoor-gambit-exposes-pakistans-made-in-china-shield/articleshow/121112993.cms

India’s military operation Sindhoor against Pakistan may be providing the first real combat test for China’s multi-billion dollar defence modernisation. While the Indian Armed Forces execute retaliatory strikes under Operation Sindoor, Pakistan claims to have deployed Chinese fighter jets in a major air battle. The episode has sharpened international focus on Beijing’s role as Pakistan’s chief arms supplier and the larger geopolitical consequences of Chinese weaponry being used against a US-aligned regional power.

China denies arms support during conflict

On Monday, China’s military dismissed widespread speculation that it sent its largest military transport aircraft, the Y-20, carrying arms to Pakistan during its standoff with India. The People’s Liberation Army Air Force called the reports “rumours” and issued a stern warning.

The denial came after social media users claimed the Y-20 had flown military supplies to Pakistan amid Operation Sindoor. China also previously rejected Pakistani claims that Chinese fighter jets were used during attacks on India, while urging restraint from both sides. “China opposes all forms of terrorism. We urge both sides to act in the larger interest of peace and stability, remain calm, exercise restraint, and refrain from taking actions that may further complicate the situation,” a Chinese Foreign Ministry spokesperson said.

Operation Sindoor and the Indian response

India launched Operation Sindoor following a terrorist attack in Pahalgam that killed 25 Indian tourists and one Nepali citizen. The Indian Air Force responded with precision missile strikes targeting nine alleged terror camps across Pakistan and PoK.

The operation, executed under cover of darkness, marked a sharp escalation. It also reopened old wounds between the two nuclear neighbours, who have fought multiple wars over Kashmir since 1947. But this time, the weapons in play – and their origins – are drawing global attention.

The Rafale is one of the most advanced platforms in India's air arsenal, acquired from France as part of New Delhi's shift away from Russian dependency. India has increasingly aligned with the US and its allies, sourcing over half of its recent weaponry from countries like France, Israel and the US.

Pakistan, meanwhile, has almost entirely turned to China. Between 2020 and 2024, 81% of Islamabad's imported weapons came from Chinese suppliers, according to the Stockholm International Peace Research Institute (SIPRI). These include advanced fighter jets, radars, air defence systems and precision missiles.

From Pentagon to PLA: How China replaced the US in arming Pakistan

China has now become the backbone of Pakistan's military hardware—and it happened after Washington shut the tap. Until 2010, the United States was Pakistan's main defence partner. But that changed. The U.S. grew increasingly frustrated by Islamabad's double game—supporting the Afghan Taliban, harbouring the Haqqani network, and turning a blind eye to groups it cultivated for cross-border attacks.

By 2016, Washington stopped arms sales. Into that void stepped China.

Between 2014 and 2024, Beijing sold Pakistan over $9 billion worth of weapons, now accounting for more than 80% of Islamabad's military imports, according to SIPRI data. This shift has reshaped Pakistan's armed forces from top to bottom, and India is watching closely.

Army: Chinese Weapons, Pakistani Uniforms

Chinese gear now powers much of Pakistan's land warfare capabilities, allowing its army to maintain modern platforms despite budget limits and sanctions.

VT-4 Tanks ("Haider")

- Quantity: 176
- Cost: $859 million
- Contract: Signed in 2018, inducted in 2020
- Purpose: Third-gen main battle tanks to counter India's T-90MS and Arjun fleet
- Significance: Enabled upgrades to Pakistan's indigenous Al-Khalid tanks using Chinese tech

SH-15 155mm Howitzers

- Quantity: 236
- Cost: $500 million
- Contract: 2019, inducted by 2022

- Range: Up to 50 km
- Significance: High-mobility, long-range artillery aimed at countering India's K-9 Vajra systems

LY-80 Air Defence (HQ-16 export version)

- Units: 9 batteries
- Cost: $599 million
- Contract: 2013–2015, inducted in 2017
- Range: 40 km, altitude up to 15 km
- Significance: Enhances Pakistan's protection from low- and medium-altitude air threats

Air Force: Skies Patrolled by Chinese Jets

China has transformed the Pakistan Air Force into a more modern fighting force. Much of the change unfolded over the past decade.

JF-17 Thunder

- Project: Jointly developed with China
- Variants: Block II delivered by 2015–16, Block III inducted by 2022
- Upgrades: Chinese AESA radar, PL-15 long-range missile capability
- Significance: Flagship joint project, critical to PAF's modernisation

J-10C "Firebird"

- Quantity: 25
- Cost: $1–1.5 billion
- Contract: 2021, inducted 2022
- Significance: 4.5-gen jet rivalling India's Rafale. "We have bought J-10C to balance India's acquisition of Rafales," Pakistani officials said.

HQ-9 Long-Range Air Defence

- Inducted: 2021 (HQ-9/P), 2022 (HQ-9BE, FD-2000 variant)
- Significance: Covers major urban and strategic targets; improves defence against missiles and aircraft

Chinese UCAVs

Types: CH-4 "Rainbow", Wing Loong II

- Use: Reconnaissance, precision strikes
- Significance: Pakistan now second only to China in UCAV deployments in Asia-Pacific

Karakoram Eagle (ZDK-03 AWACS)

- Quantity: 4
- Cost: $278 million
- Inducted: 2015
- Significance: Early-warning aircraft improved PAF's battlefield surveillance and command capabilities

Navy: Chinese Ships in the Arabian Sea

Traditionally Pakistan's weakest service, the navy has received major Chinese reinforcements—on sea and underwater.

Hangor-Class Submarines (Type 039B/041)

- Quantity: 8
- Cost: $4–5 billion
- Contract: Signed 2016
- Inducted: 2023–24 (4 subs), 2028 (next 4)
- Significance: Boosts second-strike capability; may carry Babur-3 nuclear cruise missiles

Type 054A/P Frigates (Tughril-class)

- Quantity: 4
- Inducted: 2021–2023
- Features: Advanced anti-ship and anti-air weapons
- Significance: Highlights China's capability to fulfil complex contracts on time even during COVID-19

Azmat-Class Fast Attack Crafts

- Quantity: 4
- Missiles: 8 C-802A anti-ship per vessel
- Significance: Built with Chinese help; enhances Pakistan's punch in littoral warfare

"A powerful advertisement" for China's arms industry

The use of Chinese-made weapons in a high-intensity conflict is being watched closely by military observers. Pakistan's J-10C jets – equipped with AESA radars and possibly PL-15 long-range air-to-air missiles – are considered 4.5-generation fighters, on par with the Rafale.

"The engagement represented a milestone in the operational use of advanced Chinese-origin systems," said Salman Ali Bettani, international relations scholar at Quaid-i-Azam University, Islamabad.

For China, the battle could serve as a live demonstration of its weapons systems. “It will potentially be a huge boost for Chinese arm sales in the international market,” said Senior Col. (ret) Zhou Bo, a fellow at Tsinghua University’s Centre for International Security and Strategy told CNN.

Indeed, defence stocks in China surged this week. AVIC Chengdu Aircraft, maker of the J-10C, saw a 17% jump on Wednesday, followed by a further 20% on Thursday – even before Pakistan’s Foreign Minister confirmed the use of the jets.

Deepening Sino-Pakistan defence ties

China’s defence partnership with Pakistan extends beyond hardware. The two countries regularly conduct joint air, sea and land exercises, including simulated combat missions. Some of Pakistan’s weapons, like the JF-17 Block III, have been co-developed with Chinese firms. Others, like the HQ-9B surface-to-air system, are built with Chinese technology.

“This isn’t just a bilateral clash anymore; it’s a glimpse of how Chinese defence exports are reshaping regional deterrence,” said Craig Singleton, senior fellow at the Foundation for Defense of Democracies.

The shift in defence dependencies has its roots in strategic estrangement. The US once armed Pakistan, but stopped selling weapons in recent years over Islamabad’s ties to militant groups and lack of democratic reform. China stepped into the gap. “China used the opportunity to show itself as the only real friend and ally of Pakistan,” said Siemon Wezeman, senior researcher at SIPRI.

Tactical gains, strategic doubts

Not all analysts agree that the conflict proves Chinese superiority. Some argue India’s supposed aircraft losses, if true, may reflect strategic miscalculations rather than superior enemy hardware.

“If reports of India losing multiple jets holds up, it would raise serious questions about the IAF’s readiness, not just its platforms,” said Singleton. “The Rafales are modern, but warfighting is about integration, coordination, and survivability — not just headline acquisitions.”

Others point out that India’s missiles did hit their targets in Pakistan, which suggests that Chinese-made Pakistani radar and missile defences failed to intercept them. “If Chinese-origin radar or missile systems failed to detect or deter Indian strikes, that’s (also) bad optics for Beijing’s arms export credibility,” said Sajjan Gohel, Asia-Pacific Foundation. As tensions simmer, the conflict is shaping up as a proxy test between Chinese and Western military technology. It also highlights India’s growing strategic tilt towards the West, and Pakistan’s deepening embrace of China.

“From China’s perspective, this is essentially a powerful advertisement,” said Antony Wong Dong, a military observer based in Macau. “It will shock even countries like the United States — just how strong is its opponent, really?”

But in the end, this isn’t just about arms or influence. It’s about the security of a region where the stakes have never been higher – and where every missile, jet, or miscalculation could shape the future of Asian geopolitics.

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India steps up maritime security after review

Source: Hindustan Times, Dt. 10 May 2025,
URL: https://www.hindustantimes.com/india-news/india-steps-up-maritime-security-after-review-101746820437988.html

Union minister Sarbananda Sonowal on Friday reviewed security measures at ports as the country raised alertness to the so-called MARSEC-2 level to keep shipping lines protected and operational amid escalating tensions with Pakistan, an official said.

The ports, shipping and waterways minister, who visited Mumbai during the day, met representatives from key state-run maritime organisations, including the Shipping Corporation of India (SCI), Jawaharlal Nehru Port Authority (JNPA), Indian Port Rail and Ropeway Corporation Ltd (IPRCL), Indian Port Global Ltd (IPGL), directorate general of shipping and the Mumbai Port Authority.

“The minister carried out an in-depth review of port security and assessed all ongoing infrastructure projects, and asked officials to ensure business as usual,” the official said, asking not to be named.

The directorate-general of shipping has ordered all ports, terminals and shipyards to elevate maritime security measures to the International Ship and Port Facility Security Code (ISPS) level 2, also known as MARSEC-2, the official said.

Enhanced protective measures are required not just for all functional ports but also for those under construction against all threats, the official said. Nearly 95% of India’s trade and 80% of its crude oil supply is shipped through the oceans.

“This directive is issued in the national maritime security interests and must be treated with utmost urgency and priority,” the advisory issued by directorate-general of shipping said.

Those who attended the review meeting included secretary, ports, TK Ramachandran.

“All Indian flagged vessels operating in and near to the India sub-continent and neighbouring countries are required to elevate the security Level to 2 and implement the applicable security measures as per Ship Security Plan (SSP),” a notification by the shipping regulator stated.

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Decade of planning, political resolve gave India combat edge against Pak

Source: The Tribune, Dt. 10 May 2025,
URL: https://www.tribuneindia.com/news/india/decade-of-planning-political-resolve-gave-india-combat-edge-against-pak/

Since the first leg of Operation Sindoor launched by the military in the aftermath of the April 22 Pahalgam terror attack, India has thwarted all Pakistani attempts to breach national sovereignty.

The swift Indian response establishes the strength of national air defence systems assiduously built over the past decade under Prime Minister Narendra Modi-led government's national security policy. On the other side, the Indian military's response has exposed the chinks in Pakistani air defence mechanisms.

Top official sources point to a concerted effort over 11 years to acquire cutting-edge weapon systems and point to the Integrated Counter-Unmanned Aerial System (UAS) Grid, S-400 Triumf systems, Barak-8 missiles, Akash surface-to-air missiles and the DRDO's anti-drone technologies as the "aerial shield over Indian skies that held firm in the face of enemy hostility".

"With its initial response, which is ongoing, India has shown it is not just defending its skies but controlling them," said a government source mentioning Operation Sindoor's ability to hit deep into the Pakistani territory and destroy a Chinese-supplied HQ-9 air defence unit in Lahore, damaging key radar infrastructure in Pakistan's second-largest city.

Senior ruling BJP leaders say graded and focused acquisitions in spite of consistent Congress-led Opposition's offensive against the critical Rafale jet deal held India in good stead since Pakistan's April 22 provocation in Pahalgam.

India resisted US sanction threats to seal the Rs 35,000-crore deal with Russia for five S-400 Triumf squadrons in 2018. Three of these squadrons are now operational along the borders with China and Pakistan, securing India.

The deployment of Barak-8 medium-range surface-to-air missiles (MR-SAM), a $2.5 billion deal signed in 2017 with Israel, continues to guard the frontline bases like Bathinda. Developed by India's Defence Research and Development Organisation and Israel Aerospace Industries, the state-of-the-art surface-to-air missile system can engage a range of aerial threats in one of India's most sensitive regions.

Indigenous high-end military technologies used in the response against Pakistan include the DRDO-developed Akash missile system with 96 per cent domestic content, counter-drone technology and Man Portable Counter Drone Systems (MPCDS) to jam and disable hostile UAVs.

On the modern warfare front, Operation Sindoor saw the combat debut of loitering munitions, suicidal drones ordered under emergency procurement in 2021 and jointly developed by India and Israel.

"These drones executed simultaneous, precision strikes across sectors, taking Pakistan's defences by complete surprise," said official sources.

They added that Israeli-origin Harop drones, now locally built, were also deployed to target and destroy air defence assets in Karachi and Lahore. "These platforms, combined with the strategic deployment of Rafale fighter jets equipped with SCALP and HAMMER missiles, demonstrated India's capability to project power with surgical precision," a government note said of the Indian strong tech-driven air defence shield capable of detecting, jamming and eliminating threats before they breach.

"Operation Sindoor gives a clear message of Indian dominance of the land and skies in this combat. This military operation mirrors our rise as a self-reliant defence power capable of

producing high-end military technologies at home and a rising global power conscious of its responsibilities to bolster the national defence paradigm, notwithstanding internal and external opposition and threats," said a senior government source.

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Op Sindoor negates Pak's nuclear blackmail

Source: The Tribune, Dt. 12 May 2025,
URL: https://www.tribuneindia.com/news/comment/op-sindoor-negates-paks-nuclear-blackmail/

Over four days, between May 7 and May 10, India's armed forces defended India's borders over land, sea and air, to avenge the April 22 Pahalgam massacre. Until the May 10 ceasefire, an intense air battle ensued between India and Pakistan, involving drones, fighter planes and even missiles. This was a new form of fighting, shaped by the Ukraine war and the Gaza conflict.

Swarms of drones and even missiles were intercepted by Indian air defence systems. Similarly, Pakistan's air defence system was tested, as some Indian missiles successfully hit their targets. India destroyed Pakistan's air defence system in Lahore, believed to be the Chinese HQ-16, acquired by Pakistan in 2013-15.

Two other vital Pakistani air bases were attacked. The Nur Khan base in Rawalpindi is a transport hub, bordering Islamabad. But, more critically, it abuts Pakistan's Strategic Plans Division, which controls Pakistan's nuclear arsenal.

According to the New York Times, this strike inflamed Pakistani fears of India decapitating its nuclear command-and-control system.

International observers see matched exchanges rather than Indian dominance. It's easier to blame a bias in the Western media, rather than accept the fact that briefings could have been more substantive before the cease-fire kicked in. I hark back to the days I was the government's spokesman, post-1998 nuclear tests, and remember that PM Atal Bihari Vajpayee and his office allowed functional freedom in media briefings.

What, then, is the net outcome of Operation Sindoor? Some hyper-nationalist analysts and anchors question why India did not continue operations until Pakistan accepted defeat, before settling for a ceasefire.

US claims of mediation complicate the picture further. Days after Vice-President JD Vance described the South Asian conflagration as "none of our business", Donald Trump announced there would be a ceasefire. Secretary of State Marco Rubio added a third twist, claiming it had engaged the PMs of both India and Pakistan. They would soon "start talks on a broad set of issues at a neutral state," Rubio said.

Trump jumped in again, promising enhanced trade with both countries and a "solution" to the Kashmir issue, a dispute he saw extant for a "thousand years". He reflected a lack of awareness about Kashmir — the fact remains that the region's defining feature has hardly been communalism,

not at least since it was part of Maharaja Ranjit Singh's empire and after his death in 1839 and that his foreign minister was Fakir Azizuddin.

Pakistan's PM Shehbaz Sharif grabbed the opening to deescalate the current crisis, thanking Trump for his "proactive role for peace in the region." He proclaimed: "We've won, this is a victory."

Trump, having failed to achieve the same in Ukraine or Gaza, is revelling in this unexpected success. Significantly, he has achieved it days before arriving in the Gulf on May 16 to solicit investments, besides controlling Iran's nuclear programme and Israel's brutal ambitions in Gaza.

Nevertheless, Operation Sindoor has yielded multiple benefits for India. First, Pakistan's nuclear blackmail stands negated. Pakistan began to openly sponsor terrorism against India only after acquiring nuclear weapons by 1987. Thereafter, India was constrained in responding to terror attacks, including the 2001 Parliament and 2008 Mumbai attacks. That hesitation now stands negated.

The New York Times believes the US was energised to intervene only after intelligence reports stated the situation was closing towards nuclear escalation. Pakistan has been known to move its nuclear assets to attract international and, especially, US attention.

Second, though India has debated using river waters as a weapon, it restrained itself from rescinding the Indus Waters Treaty. Post-Pahalgam, the Treaty has been suspended and run-of-the-river low-storage facilities employed to alter the water flow to Pakistan. A new weapon has been operationalised to control Pakistani conduct. Pakistan's implied threat all these years -— to stop terrorism in exchange for Kashmir — now has a matching card.

Finally, India has properly tested Pakistan's air-attack offensive capabilities and air defences. Pakistan, too, has claimed the same, by targeting 12 Indian cities with 300-400 drones. I'm sure lessons have been learnt, which need to be translated into the upgrading of our defences. Warfare in the 21st century will require more than infantry and armour.

The challenges now are diplomatic and political. Domestically, the government will face questions as to why the US has made claims of "mediating" to end the crisis —remember that post-Simla Agreement, India has maintained that Indo-Pakistan disputes had to be tackled bilaterally. The Composite Dialogue Process, launched in 1997, continued till the BJP came to power in 2014. It rested on the Kashmir issue being tackled alongside more easily handled issues of Sir Creek, trade, etc.

But Pakistani impatience at seeing progress on the Kashmir issue actually stalled progress in achievable areas. This means that CBMs and dispute resolution is sometimes impractical. While the former are usually supposed to facilitate the latter, Pakistan inverted that logic, implying that if the big issue, Kashmir, were to be resolved, the rest would automatically follow. Meanwhile, it continued to sponsor terrorism, reflecting domestic compulsions or civil-military dissonance.

PM Narendra Modi junked this failed approach after the 2019 Pulwama terror attack and the Balakot retribution. Constitutional changes eliminated Article 370 and Kashmir's special status. Dialogue with Pakistan was shelved, ties downgraded and Pakistan's existence literally denied. The only pre-condition: dismantle the terror network. Balakot was taken as a bottom line to establish

deterrence against future terror attacks. Pahalgam exploded that myth. Thus, if the old dialogue process based on the Gujral doctrine has failed, so has the post-2019 Modi doctrine.

India says it is uncommitted to any talks and that deterrence has been re-established. But there is also a reluctance in Delhi to defy or offend Trump. A new dialogue process, perhaps a back-channel, will become inevitable to discuss at least two issues, that is terrorism and river waters.

Despite Sharif exulting in assumed Pakistani victory today, the civil-military equation will be tested in the coming months. With its popular leader Imran Khan in jail following a Faustian deal between Sharif and the army chief, General Asim Munir, the status quo may not hold much longer.

In India, too, the government's micro-management of messaging and intolerance of even mild criticism is unsustainable. Pakistan is again being equated with India in large parts of the West. The government must introspect and rectify past tactics as it finds a new path and agenda between the past composite dialogue and total disengagement.

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S-400, Akash, electronic war: How India's air-defence systems protect skies from Pakistan ceasefire violations

Source: Hindustan Times, Dt. 11 May 2025,
URL: https://www.hindustantimes.com/india-news/s400-akash-electronic-war-how-indias-air-defence-systems-protect-skies-from-pakistan-ceasefire-violations-101746968323741.html

Amid the heightened Indo-Pak hostilities, air defence systems have played a key role in protecting India’s airspace. These systems have been crucial in detecting, tracking and neutralising aerial threats like aircrafts, drones and missiles.

The air defence systems used to counter Pakistan’s response to Operation Sindoor have been designed to use a network of radars, control centers, artillery, and both aircraft and ground-based missiles. Meanwhile, detection, tacking and interception is managed through the command control and communication (C3).

S-400, Akash, anti-aircraft guns, fighter jets and electronic warfare system

In response to cross-border shelling and drone attacks from Pakistan, the Indian Army has been employing the air defence systems and it has proved to be highly successful.

As soon as a threat is detected, the interception phase begins which sees fighter jets take on enemy aircraft while surface-to-air missiles (S-400 and Akash) take on incoming threats. Anti-aircraft guns are also used by the Indian Army, to target low-altitude threats. Meanwhile, enemy communication is also jammed through an electronic warfare system.

The S-400 is of Russian-origin, and can detect, destroy hostile strategic bombers, jets, spy planes, missiles and drones at a range of 380 kilometres. Meanwhile, the shoulder-fired Igla-S missiles have an interception range of 6km.

Akash surface-to-air missile system

The Akash surface-to-air missile system is Indian-made and has been designed to detect, destroy aerial targets with accuracy. During the ongoing escalation, the system intercepted multiple threats successfully, and was hailed by military experts.

The ceasefire between India and Pakistan was announced on Saturday, and it began from 5:00 PM IST. But hours later, Pakistan violated the agreement and triggered cross-border firing once again. Blackouts were observed in many border districts in India and normalcy has resumed post midnight.

The ongoing hostilities began with the Pahalgam terror attack last month, which took the life of 26 civilians. The attack's responsibility was claimed by The Resistance Front (TRF), an offshoot of Lashkar-e-Taiba. In response, India launched Operation Sindoor and successfully struck terror camps in Pakistan.

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Recently upgraded air defence guns take down Pak drones

Source: The Hindu, Dt. 10 May 2025,
URL: https://www.thehindu.com/news/national/recently-upgraded-air-defence-guns-take-down-pak-drones/article69558659.ece

The Government on Friday (May 9, 2025) said on record that Pakistan has launched 300-400 drones, likely Songar Drones by Asisguard of Turkey, across the western border and a number of them were shot down by Indian air defences. Army Air Defence guns firing air burst ammunition intercepted the small drones. The overall air defences across the Indian air space are monitored and controlled by the Indian Air Force's (IAF) Integrated Aerial Command and Control Systems (IACCS) nodes at various locations.

Informed sources, however, said over 500 drones, mostly quadcopters, were sighted in three waves in 36 places across the western border on Thursday (May 8) night between 8 p.m. to 11:30-12 a.m. "Majority were small quad copters which don't show up on most radars, except the low level lightweight radar which has been calibrated to detect them," a source said.

Meanwhile, the retaliation included a calibrated response which included Long Range Loitering Munitions, including the Harop and the Harpy, the result of which was seen on television yesterday, sources said.

Songar drones are armed Quadcopters developed by Asisguard of Turkey with a 3-km operational radius. And countering them were air defence guns – L-70, Zu-23 and Shikla – all of which have been upgraded recently and can fire air burst ammunition, which is effective in taking down small drones.

For instance, the L-70s have been upgraded recently by optical sights and hydraulic systems by Bharat Electronics Limited (BEL). Air burst rounds burst close to a target but don't hit them. This makes them highly effective in taking down a swarm of drones.

Air Defence networks function in layers and at three levels – gun/missile system, medium range and long range. At the longest range is the S-400 with a range of 400 km, followed by the

MRSAM (Medium Range SAM) with a range of around 70 km, Akash (25 km), Israeli Syyder SAM (around 10 km), and then legacy systems such as the Osa-AK and Tunguska systems. After this are shoulder-fired very short range systems like the Igla-S as well as the Strela-mounted systems.

Emergency procurement to the rescue to meet Army's requirement of very short range air defence missilesAir burst ammunition, laser and microwave weapons, and smart ammunition are in various stages of procurement. While upgradation of high-end air defence systems is ongoing, equipping existing L-70 and Zu-23 air defence guns with air burst ammunition has been identified as a priority from the lessons of the Ukraine war. A tender has already been floated for 30mm fragmentation ammunition for the existing vintage guns.

The Army has already issued a Request For Proposal for a successor gun to replace the L70 and Zu-23 for 220 guns along with smart ammunition. Trials are expected to commence this July and the contract is likely to be signed by May-June 2026, Director General of Army Air Defence Lt Gen Sumer Ivan D'Cunha had said recently while adding that they are not looking to import any guns. "Smart ammunition is the next level. Every round can be programmed. 17 rounds of High Explosive rounds can be roughly equated to one round of smart ammunition. It increases kill probability and reduces logistics," he had stated.

With the heightened threat of drones in both conventional and non-conventional conflicts, the Army had issued a Request For Information in January 2025 for 23 mm ammunition for its Zu-23mm and Schilka air defence weapon systems in service. The Army is also looking to procure air burst rounds for its 30mm cannons on infantry combat vehicles to counter drone threats to its armoured regiments.

The Indian Air Force (IAF) is responsible for looking after the air defence of the country. The IAF has set up Integrated Air Command and Control System (IACCS) nodes across the country, which act as crucial nerve centres monitoring the entire air space and communicating with various layers involved – radars, satellites, ground stations and firing units among others. In case of an incoming aerial threat, the IACCS nodes at handling the concerned location accesses the targets and assigns the particular air defence system suitable to take down the incoming targets.

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Operation Sindoor: Turkish drones to Chinese missiles, India beat them all

Source: The Times of India, Dt. 13 May 2025,
URL: https://timesofindia.indiatimes.com/india/turkish-drones-to-chinese-missiles-india-beat-them-all-pakistan/articleshow/121121289.cms

From Turkish drones to Chinese missiles, and possibly even a few Pakistani aircraft, all were thwarted by India's integrated multi-layered air defence network during three days of intense hostilities, top military officers said on Monday.

"Our integrated air defence (AD) systems stood like a wall and they (Pakistan) could not breach it. Whether it's a Turkish drone or anything else, it fails in front of the technology of India," director general of air operations Air Marshal A K Bharti said.

"The sky remains ours," with a relatively impregnable AD shield, was the underlying message of the briefing he addressed with his Army and Navy counterparts, Lt-General Rajiv Ghai and Vice Admiral A N Pramod, on Monday.

"All our military bases, all our systems continue to remain fully operational. They are ready to undertake any future missions should the need arise," Air Marshal Bharti added.

The officers showed evidentiary photos of Pakistan having used Chinese-made PL-15 LR beyond visual range air-to-air missiles as well as Turkish-origin Byker Yiha kamikaze and Asisguard Songar drones, apart from long-range rockets, loiter munitions and quadcopters.

Most of them were shot down by India's AD systems, while the ones that got through caused only minimal damage. "Whenever Pakistan Air Force attacked us, it failed in front of our AD grid," Lt-Gen Ghai said.

As reported by TOI earlier, the AD network of surveillance and target-acquisition radars and a wide array of weapon systems are all plugged into the integrated air command and control system (IACCS) of the IAF and the Akashteer system to provide a composite real-time air picture to the armed forces.

The network stretches from the long-range Russian S-400 'Triumf' surface-to-air missile systems (380-km interception range) and Barak-8 medium range SAM systems (70-km), jointly developed with Israel, to the shoulder-fired Igla-S missiles (6-km) and the indigenous integrated drone detection and interdiction systems (1-2 km).

The indigenous Akash system, which is capable of intercepting hostile aircraft, helicopters and drones at a range of 25-km, falls in between. "Another highlight has been the stellar performance of indigenous AD weapons like Akash," Air Marshal Bharti said.

The IAF, as reported by TOI earlier, has inducted the bulk of the 15 squadrons of Akash-1 and 2 systems it has ordered for Rs 10,900 crore. The Army, in turn, has four Akash regiments worth Rs 22,340 crore, with more in the pipeline. A new-generation Akash weapon system, with an interception range of 30-km, is also now ready for the final trials.

The senior IAF officer also praised the "performance and efficacy" demonstrated by even older AD systems like the Pechora missiles, OSA-AK-m (10-km) and low-level L-70 anti-aircraft guns (3.5-km) in countering the "Pakistani threat vectors".

Of the 300 to 400 drones launched by Pakistan across the entire western front on May 8, for instance, 50 were destroyed by L-70 and ZU-23mm twin-barrel guns and other such weapons.

Another 20 drones were jammed and spoofed by a variety of devices, while the rest flew back across the border. At the other end of the spectrum, a Pakistani high-speed missile was intercepted over Sirsa by an advanced AD missile system on May 10.

Though the Navy's formidable "fleet air defence mechanism" did not come into play in the northern Arabian Sea, Vice Admiral Pramod said the presence of aircraft carrier INS Vikrant battlegroup, with MiG-29K fighters and early-warning helicopters, compelled the Pakistan Air Force to remain "bottled-up" close to the Makran coast.

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Satellite images show damage India wrought on Pakistan military

Source: Hindustan Times, Dt. 12 May 2025,
URL: https://www.hindustantimes.com/india-news/satellite-images-show-damage-india-wrought-on-pakistan-military-101747018509420.html

Satellite imagery released by India's defence ministry and commercial service providers on Sunday confirmed a series of precision strikes carried out by the Indian side on eight key Pakistani airbases on May 10, hours before the two sides reached an understanding on halting all military actions.

Smoke rises from a terrorist launchpad in Sialkot, Pakistan, after it was destroyed by Indian armed forces on Saturday

India's military targeted the eight Pakistani airbases with missiles and other long-range weapons in retaliation for Pakistan's attempts to strikes 26 military facilities early on May 10, people familiar with the matter said on Sunday. The Indian strikes exposed the "massive gap" between the technological and military sophistication and application of power by the armed forces of the two sides, the people said.

Damien Symon, a geo-intelligence researcher at The Intel Lab, said the imagery provided by India's defence ministry confirmed a series of well-executed precision airstrikes targeting several Pakistani military facilities.

"The strikes appear intentionally designed to neutralise specific military infrastructure while avoiding collateral damage," Symon said.

A satellite image shows Markaz Taiba following airstrikes in Muridke, Pakistan, May 7, 2025.

At the Nur Khan airbase in Rawalpindi, a likely operations-related building and vehicles were "visibly impacted". Symon said: "The vehicles were destroyed while the building compound showed signs of damage."

A satellite image shows a closer view of buildings damaged following airstrikes in Bahawalpur, Pakistan

The airstrip at the airbase at Sargodha in Punjab province was hit at two points, likely disabling take-offs and landings until repairs to the runway are completed. The Shahbaz airbase at Jacobabad in Sindh province "suffered a strike on a hangar located adjacent to the ATC tower", though the traffic control facility remained structurally unharmed, Symon said after analysing the imagery.

At the airbase at Rahim Yar Khan in Punjab province, there was “extensive damage” to the runway, with the “underlying structural layers exposed an indicator of long-term disruption”, Symon said.

Satellite images of the airstrikes

The people cited above said the facility at Rahim Yar Khan was hit the hardest, with the “runway being totalled”. At the airbase at Sukkur in Sindh province, a UAV storage depot “endured considerable damage, with roof damage and scattered debris evident”, Symon said.

In the case of the airbase at Bholari in southern Sindh province, a hangar that is possibly used for airborne early warning systems or maintenance work showed “serious structural impairment with debris scattered all around”, Symon said.

This combination of pictures created on May 8, 2025 using handout satellite images shows the Jamia Masjid Subhan Allah compound on May 2, 2025 (top), and on May 7, 2025 (bottom) after an Indian strike on the outskirts of Bahawalpur in Pakistan's Punjab

In addition to the strikes on the eight airbases, the satellite imagery showed that the Indian military apparently targeted radar installations that were "likely tied to Pakistan's early warning and surveillance systems" and this will cause potential disruption to the Pakistan Air Force's monitoring and operations, he said.

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Highly confidential manual guided India's top officials during conflict with Pakistan

Source: Hindustan Times, Dt. 12 May 2025,
URL: https://www.hindustantimes.com/india-news/highly-confidential-manual-guided-india-s-top-officials-during-conflict-with-pak-101746988979842.html

A blue-coloured, limited-edition government manual of over 200 pages, which is not in the public domain, has served as a go-to handbook for key bureaucrats across the country during the past week, as it outlined the response and functions of various arms of government during an armed conflict.

The Union War Book 2010 is the original limited edition, so secretive that the ministry of defence, ministry of home affairs and the cabinet secretariat officials who helped prepare it and update it annually can't tell you who its rightful keepers are but HT learns that there is one copy with each state chief secretary apart from the Union ministries involved. And from fire drills to evacuations and sirens, the entire emergency response to-do list is dictated by this book lying on their desks.

"It tells these key officers what each one of them should do in case of a war. So there is no confusion at all and everybody has a clear idea of what protocol to follow,'' was all that one key bureaucrat was willing to say to HT, on condition of anonymity.

The concept of the war book goes back to colonial times but every 15 years or so, a new edition is brought out. In 2010, two years after the deadly 26/11 terror attacks that saw 174 including security officials dead, the book that has now become everyone's guide took shape. Home secretary GK Pillai who oversaw its compilation did not offer any comments when contacted by HT.

While its contents are a secret, this 15-year-old manual is being publicly cited by all authorities. For instance, after Maharashtra chief minister Devendra Fadnavis held a closed-door meeting on Friday night, the CM's office issued a note in Marathi about the highlights of that meeting. One line from that read, "Study central government's Union war book and inform about the instructions to all the concerned."

But wouldn't a 2010 edition be outdated? How would it talk about disinformation and all the modern tools of technology? Were, for instance, drones that were used extensively by Pakistan dealt with in detail? "While an updated version of the book is brought out every 15 years or so, every year, the three ministries send notes. These are then pasted on the book. Technological updates are a part of it,'' said the officer cited above.

However, they note, in times of war, old is gold. They point out that they still advocate keeping the old fashioned radio and torches, because mobile connectivity or the network could be targeted by India's adversaries. In that situation, the government would resort to older modes of communication.

"The thing for the public to know is that the Indian establishment is very good at handling emergencies. We have a lot of experience and we all know what to do,'' one of them said.

HT accessed one such state checklist which talked, among other things such as food supplies, about "social media management". "For a district cyber monitoring cell in coordination with the police IT wing," it advises officials, adding that they should track and report "inflammatory" posts. Among things to do for "administrative mobilisation", it says "create rosters of government staff and volunteers for round-the-clock shifts".

Many of these officials are hoping, however, that they will be able to put the book back into its locked corner soon, without having to implement it.

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What are Turkish Songar drones, used by Pak to attack India?

Source: The Indian Express, Dt. 10 May 2025,
URL: https://indianexpress.com/article/explained/explained-sci-tech/turkish-songar-drones-pak-india-9993416/

Pakistan's attempted drone incursion in 36 military and civilian sites between the intervening night of Thursday (May 8) and Friday (May 9) likely involved Turkish-made Asisguard Songar drones, India said on Friday.

In a press briefing, Colonel Sofiya Qureshi and Wing Commander Vyomika Singh said, "A forensic examination of the drone debris is currently underway. Preliminary reports indicate that the drones are Turkish-made Asisguard Songar models."

Designed and manufactured by Turkey-based defence company Asisguard, Songar drones were first launched in April 2019, and delivered to the Turkish Armed Forces (TAF) after successful completion of their testing in February 2020. They are Turkey's first indigenous armed drones.

Design and features

The portable unmanned aerial system (UAS) broadcasts real-time video, and operates within a radius of up to 5 km. It can ascend to an altitude of up to 3,000 m above mean sea level and 300 m above ground level. The drone can be used for both day and night military operations.

Songar consists of a pilot camera for surveillance and exploration purposes, and a gun-mounted camera. The drone comes with autonomous and manual flight control modes. It also comprises features such as returning home in case there is a loss of connection between the drone and its remote controller.

Songar drones use both Global Positioning System (GPS) and GLONASS navigation systems for communications during operations.

The armaments

There are different types of Songar drone systems based on the weapons they feature. The website of Asisguard lists five types of Songar drones: Songar 5.56 x 45 mm Assault Rifle, Songar 2×40 mm Grenade Launcher, Songar 6×40 mm Drum Type Grenade Launcher, Songar 3×81 mm Mortar Gripper, Songar 8 x Tear/Smoke Grenade Launcher. Each one of them comes with multi-layered firing safety measures until the operator's authorisation is received.

Songar's assault rifle carries 5.56×45 mm cartridges, the standard cartridge used by guns made for North Atlantic Treaty Organization (NATO) militaries. It comes with a recoil force-damping mechanism which reduces the impact of recoil on the drone.

The grenade launcher type Songar can fire up to two grenades within the range of 400-450 metres. For firing more grenades, there is the Drum Type Grenade Launcher which can launch up to six grenades within the same range as the Songar 2×40 mm Grenade Launcher.

The tear or smoke grenade launcher can fire up to 8 grenades, and "executes direct impact on target through controlled free-fall deployment (controlled descent through the air)," according to Asisguard.

Performance

Songar drones are designed for coordinated attacks with other military assets, such as troops or other drones. It also offers versatility during land, maritime and special operations.

The UAS can be deployed stealthily, allowing forces to launch a surprise attack without revealing their location or presence.

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Visible weapons, invisible enemy: A new era of war

Source: Hindustan Times, Dt. 11 May 2025,
URL: https://www.hindustantimes.com/india-news/visible-weapons-invisible-enemy-a-new-era-of-war-101746907470811.html

Pakistan used Turkish-origin drones to target 36 locations and deployed Chinese-made PL-15 air-to-air missiles fired from JF-17 fighter jets against India. The four-day conflict between India and Pakistan revealed warfare's dual revolutions: advanced strike systems and sophisticated information operations that aided both sides to target the other deep behind enemy lines without crossing physical borders. Both militaries deployed drones, standoff weapons and automated air defences, while simultaneously waging battles over perception and reality on the digital battlefield.

The conflict— the first between the nuclear-armed neighbours since 1999 — marked the combat debut of multiple advanced systems that circumvented conventional confrontations. Pakistan used Turkish-origin armed drones to target 36 locations simultaneously across a 900-kilometre frontier and deployed Chinese-made PL-15 beyond visual range air-to-air missiles fired from JF-17 fighter jets against India for the first time.

India countered with its own firsts aided by an years-long effort by the government to enhance the nation's air defence capabilities. S-400 air defence systems, Akash surface-to-air missiles, Barak 8 defences, and anti-drone technologies ringfenced Indian territory and repelled the Pakistan's air offensive. In offensive capabilities, Rafale fighter jets launching Scalp cruise missiles and Hammer smart weapons, and loitering munitions—essentially sensor-equipped kamikaze drones—added to the effectiveness of India's strikes on enemy targets. When the Indian Air Force targeted eight Pakistani military sites on Friday and Saturday —including airbases, radar units and ammunition dumps—the attacks came from standoff ranges within Indian territory.

"Operation Sindoor has demonstrated that the dynamics of India's response to cross-border terrorism too have changed," said a person familiar with the operation, asking not to be named. "We have shown that we are capable of striking terrorist infrastructure and military installations deep within Pakistan, and that there will be a high cost for cross-border terrorism."

The new inductions, especially the Rafale- S 400 combination, have given India a direct edge over the adversary, strategic affairs expert Air Marshal Anil Chopra (retd) said had said earlier. "The

weapons and systems in our arsenal are a nightmare for Pakistan. We have not only boosted our military capability but are also on track to induct newer weapons and technologies with an eye on the future."

While physical weapons struck tangible targets, an equally consequential battle raged in the information domain. Officials highlighted Pakistan's "extensive disinformation campaign" designed to "cover its failures and deceive the international community and its own population." Pakistan's false claims included assertions about destroying Indian S-400 systems at Adampur, damaging airfields at Suratgarh, Sirsa, Srinagar, Jammu, Pathankot, Bhuj and Naliya, neutralising a BrahMos base at Nagrota, and eliminating an ammunition dump in Chandigarh. "India unequivocally rejects these false narratives being spread by Pakistan," an official declared at an Operation Sindoor briefing.

Foreign secretary Vikram Misri further debunked Pakistan's claims about destroying military installations, critical infrastructure, and power and cyber systems. These weren't merely propaganda efforts but strategic attempts to shape military and diplomatic responses. Pakistan also falsely accused Indian forces of targeting mosques. "Let us make this very clear here that India is a secular nation and the Indian armed forces reflect our constitutional values," Wing Commander Vyomika Singh stated after the ceasefire announcement.

The conflict also saw unprecedented digital incursions targeting both nations. Pakistan's ministry of economic affairs' X account was compromised during peak tensions, with hackers posting appeals for "international loans after heavy losses inflected by enemy" and references to "escalating war and stocks crash." Pakistani officials quickly issued a "FAKE TWEET ALERT" and worked to disable the account, but not before the false economic distress signals briefly impacted market confidence. The source of the hack remains unidentified.

The conflict also featured deepfake videos. An AI-generated video showed Indian external affairs minister S Jaishankar "apologising" circulated widely before India's PIB Fact Check Unit debunked it. A more sophisticated synthetic video targeted Pakistan's military spokesperson, ISPR director general Ahmed Sharif Chaudhry and appeared to show him "admitting" to losing two fighter jets. These sophisticated fabrications—origin unknown—were the first time deepfakes were used in information operations in the subcontinent during an active conflict.

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युद्ध में भारतीय सैनिकों का दोस्त बन गोलाबारूद ढोएगा रोबोट, गर्मी से बचाएगी थर्मल जैकेट

Source: Jagran, Dt. 11 May 2025,
URL: https://www.jagran.com/uttar-pradesh/prayagraj-soldiers-companion-ai-robot-thermal-jacket-for-indian-army-innovations-of-iiit-scientists-will-become-the-strength-of-soldiers-23935719.html

भारतीय सूचना प्रौद्योगिकी संस्थान (आइआइआइटी) के युवा वैज्ञानिकों ने सेना के लिए दो अत्याधुनिक रक्षा उपकरण विकसित कर नई मिसाल कायम की है। इन नवाचारों में पहला है एक इंटेलिजेंट रोबोट जो युद्धभूमि में

सैनिकों का भरोसेमंद साथी बन सकता है, और दूसरा है थर्मल जैकेट जो घातक गर्मी से उनकी रक्षा करेगा। ये दोनों प्रोटोटाइप संस्थान के सेंटर फार इंटेलिजेंट रोबोटिक्स में विकसित किए गए हैं।

तेजी से बदलती वैश्विक सैन्य तकनीक के बीच, यह पहल भारतीय सेना को स्मार्ट टेक्नोलाजी से लैस करने की दिशा में एक बड़ा कदम है। यह न केवल देश की रक्षा क्षमताओं को नई ऊंचाई देगा, बल्कि आत्मनिर्भर भारत की सोच को भी साकार करेगा।

बड़े आपरेशन के दौरान सैनिक को अपने साथ काफी साजो सामान लेकर चलना पड़ता है। जो उनकी कार्यक्षमता को प्रभावित करता है। इसका हल खोजते हुए इंटेलीजेंट रोबोट तैयार किया गया है। यह न केवल भारी भरकम सैन्य साजो–सामान को ढो सकेगा, बल्कि युद्धभूमि में सैनिक का साथ भी देगा।

जीपीएस, सेंसर और आर्टिफिशियल इंटेलिजेंस (एआइ) जैसी उन्नत तकनीकों से लैस रोबोट स्वयं निर्णय लेने और स्थिति के अनुसार कार्य करने में सक्षम होगा। इलेक्ट्रानिक एंड कम्युनिकेशन इंजीनियरिंग (ईसीई) विभाग के डा. सूर्य प्रकाश के नेतृत्व में बीटेक छात्रों कविन प्रकाश, शौर्य जैन, विधि अग्रवाल और मलय चौधरी ने इस प्रोटोटाइप को तैयार कर लिया है।

रोबोट के परीक्षण में मिली सफलता

यह रोबोट न केवल दुर्गम क्षेत्रों में सैनिकों के साथ–साथ चलेगा, बल्कि जरूरत पड़ने पर घायल सैनिक को सुरक्षित स्थान तक पहुंचाने की क्षमता भी रखेगा। यह अपने लक्ष्य की पहचान कर, लक्ष्य तक पहुंचने का सर्वोत्तम मार्ग खुद चुन सकता है और मिशन पूरा होने के बाद निर्धारित स्थान पर स्वतः लौट भी सकता है। इस रोबोट का परीक्षण

सफलतापूर्वक पूरा हो चुका है और अब इसकी संचालन अवधि बढ़ाने पर कार्य किया जा रहा है, ताकि यह अधिक समय तक सक्रिय रह सके। अब विज्ञानी इसको स्वायत्त रोबोट के रूप में विकसित करने पर काम कर रहे हैं।

प्रचंड गर्मी में भी शरीर को ठंडा रखेगा थर्मल जैकेट

दूसरी परियोजना के तहत मरुस्थलीय इलाकों में तैनात सैनिकों के लिए एक स्मार्ट थर्मल जैकेट तैयार की गई है। यह जैकेट भीषण गर्मी में भी सैनिकों को राहत प्रदान करेगी। अनुसंधानकर्ता प्रो. जीसी नंदी और डा. सूर्य प्रकाश के अनुसार यह जैकेट विशेष रूप से गर्म वातावरण में काम करने वाले रक्षा कर्मियों और श्रमिकों के लिए बनाई गई है। जिससे 50 डिग्री सेल्सियस तापमान में भी यह जैकेट पहनकर आपरेशन को आसनी से किया जा सकेगा।

इस काम के लिए जैकेट में दो थर्मोइलेक्ट्रिक कूलर लगाए गए हैं जो गर्म हवा को बाहर और ठंडी हवा को अंदर भेजते हैं, जिससे जैकेट के अंदर का तापमान बाहर की तुलना में तीन से चार डिग्री तक कम हो जाता है।

वह कहते हैं कि जैकेट को पोर्टेबल पावर स्टोरेज बेल्ट से जोड़ा गया है, जिससे इसकी ऊर्जा आवश्यकताएं पूरी होती हैं। इसकी दक्षता और हल्केपन को बनाए रखा गया है। यह प्रोटोटाइप भी सफलतापूर्वक विकसित कर लिया गया है, और इसका पेटेंट भी फाइल कर दिया गया है। इस जैकेट के निर्माण में तीन वर्ष लगे। जिसे डा. सूर्य प्रकाश के साथ बीटेक छात्र हर्ष कुमार, स्मित शिंदे, जी. नरेश बाबू और एम. कविन प्रकाश ने तैयार किया है।

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BrahMos Missile : लखनऊ में आज से शुरू होगा ब्रह्मोस मिसाइल का उत्पादन, भारतीय सेना को मिलेगी मजबूती

Source: Jagran, Dt. 11 May 2025,
URL: https://www.jagran.com/uttar-pradesh/lucknow-city-brahmos-missile-production-of-long-range-ramjet-supersonic-cruise-missile-brahmos-starts-from-sunday-in-lucknow-23935254.html

भारत और पाकिस्तान के बीच तनातनी और युद्ध जैसी स्थिति के बीच लखनऊ में रविवार से सुपरसोनिक क्रूज मिसाइल 'ब्रह्मोस' का उत्पादन शुरू हो जाएगा। मुख्यमंत्री योगी आदित्यनाथ की उपस्थिति में यह ऐतिहासिक उपलब्धि हासिल होगी। रक्षा मंत्री राजनाथ सिंह 'ब्रह्मोस' की प्रोडक्शन यूनिट और टाइटेनियम एंड सुपर एलायस मैटेरियल्स प्लांट का वर्चुअल उद्घाटन करेंगे।

मुख्यमंत्री के ड्रीम प्रोजेक्ट उत्तर प्रदेश डिफेंस इंडस्ट्रियल कारिडोर के लखनऊ नोड में सुपरसोनिक क्रूज मिसाइल ब्रह्मोस की उत्पादन यूनिट साढ़े तीन वर्ष में तैयार हुई है। इसका शिलान्यास 26 दिसंबर 2021 को हुआ था। उत्तर प्रदेश डिफेंस इंडस्ट्रियल कारिडोर की घोषणा प्रधानमंत्री नरेन्द्र मोदी ने 2018 में की थी।

इस कारिडोर के छह नोड लखनऊ, कानपुर, अलीगढ़, आगरा, झांसी और चित्रकूट में रक्षा उत्पादन को बढ़ावा देने के लिए व्यापक निवेश हो रहा है। लखनऊ नोड पर ब्रह्मोस यूनिट के उद्घाटन के साथ-साथ डिफेंस टेस्टिंग इन्फ्रास्ट्रक्चर सिस्टम (डीटी आइएस) का भी शिलान्यास किया जाएगा, जो रक्षा उत्पादों के परीक्षण और सर्टिफिकेशन में सहायता करेगा।समारोह में ब्रह्मोस एयरोस्पेस और एयरो एलाय टेक्नोलाजी के साथ-साथ उत्तर प्रदेश डिफेंस इंडस्ट्रियल कारिडोर पर आधारित लघु फिल्मों का प्रदर्शन किया जाएगा।

- ब्रह्मोस प्रोडक्शन यूनिट 300 करोड़ रुपये की लागत से तैयार की गई है। इसके लिए योगी आदित्यनाथ सरकार ने 80 हेक्टेयर जमीन निश्शुल्क उपलब्ध कराई थी, जिसका निर्माण मात्र साढ़े तीन वर्षों में पूरा हुआ।

- ब्रह्मोस मिसाइल की मारक क्षमता 290–400 किलोमीटर और गति मैक 2.8 (ध्वनि की गति से लगभग तीन गुणा) है
- यह मिसाइल जमीन, हवा, और समुद्र से लांच की जा सकती है और 'फायर एंड फारगेट' सिद्धांत पर काम करती है, जिससे यह दुश्मन के राडार से बचकर सटीक निशाना लगा सकती है।

इस अवसर पर टाइटेनियम एंड सुपर एलायस मैटेरियल्स प्लांट (स्ट्रैटेजिक मैटेरियल्स टेक्नोलाजी कांप्लेक्स) का भी उद्घाटन होगा। यह प्लांट एयरोस्पेस और डिफेंस सेक्टर के लिए उच्च गुणवत्ता वाले सामग्रियों का उत्पादन करेगा, जिनका उपयोग चंद्रयान मिशन और लड़ाकू विमानों में किया जाएगा। इसके साथ ही ब्रह्मोस एयरोस्पेस की इंटीग्रेशन एवं टेस्टिंग फैसिलिटी परियोजना का भी लोकार्पण होगा, जो मिसाइलों के परीक्षण और एकीकरण में महत्वपूर्ण भूमिका निभाएगी।

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IAF procures small loitering munitions

Source: Janes, Dt. 09 May 2025,
URL: https://www.janes.com/osint-insights/defence-news/defence/iaf-procures-small-loitering-munitions

A model of the Sureshastra Mk1 loitering munition, which is being delivered to the Indian Air Force

Delhi-based Veda Aeronautics has started delivering catapult-launched small loitering munitions to the Indian Air Force (IAF) under a INR3 billion (USD35.1 million) contract secured in 2023.

Janes understands that Veda Aeronautics is supplying 200 jet-powered loitering munitions called Sureshastra Mk1 to the IAF. These loitering munitions can carry warheads and different types of sensors including for intelligence, surveillance, and reconnaissance (ISR) missions.

Sureshastra Mk1 has a length of 3.5 m, a wingspan of 3 m, a weight of 90 kg, and a range of more than 150 km.Images and videos of Sureshastra Mk1 posted by Veda Aeronautics on social media site X (formerly Twitter) show that it is a fixed-wing, V-tail platform.

In a video posted in April on X by Veda Aeronautics, Dipesh Gupta, managing director of the company is seen saying, “The IAF had some stringent requirements for loitering munitions. The IAF supported us in improving the platform [Sureshastra Mk1] based on their requirements. Sureshastra Mk1 has been designed to conduct long-range kamikaze attacks.”Gupta declined Janes request for more information about Sureshastra Mk1.

Gupta has previously told Janes that Sureshastra Mk1 can be deployed in swarms. A swarm of Sureshastra Mk1 can receive data from the ground control station (GCS), and autonomously co-ordinate within the swarm to achieve target neutralisation.Sureshastra Mk1 can navigate in GPS-denied environments. “[The loitering munition] can be easily adapted for multiple operation scenarios from acting as decoy targets to pure attack missions,” Gupta said.

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Bharat Forge, Mahindra among private defence suppliers instructed to step up production of munition, carriers

Source: The Indian Express, Dt. 11 May 2025,
URL: https://indianexpress.com/article/business/bharat-forge-mahindra-private-defence-suppliers-munition-carriers-9994456/

The government is learnt to have reached out to multiple private companies that are into defence equipment production, including Bharat Forge and Mahindra & Mahindra’s defence division. This is linked to specific instructions being issued to private vendors for upscaling supplies of certain ammunition, including for anti-drone and smart ammunition, alongside equipment such as armored vehicles that can be integrated with different weaponry — loitering munitions and guided missiles.

Instructions have been issued to these private players to step up output of some items, including designated ammunition, over and above what is already being produced by the ordnance factories. Sources in the industry said these suppliers are likely to be summoned for a follow-up meeting shortly.

The directive preceded the decision to stop firing and military action from 5 pm on May 10 after an understanding between India and Pakistan. But, there were drone activities reported in several parts of Kashmir and Gujarat subsequent to the announcement.

Bharat Forge has a large defence manufacturing facility in Jejuri, near Pune, dedicated to the assembly and integration of guns, vehicles, small and medium arms, and systems. The company had, earlier this year, signed a landmark contract with the Ministry of Defence for supplying 184 indigenously developed Advanced Towed Artillery Gun Systems (ATAGS). The 155/52 mm calibre ATAGS was jointly developed with the Defence Research and Development Organisation.

The indigenously developed ATAGS can fire projectiles up to 48 km and operates on an all-electric drives that makes it maintenance-free in comparison to regular hydraulic drives. it can move at a speed of 18 kmph, unlike towed guns, which typically move at around 8 kmph. Additionally, the ATAGS has a firing rate of six shells, compared to three for towed guns. Existing ammunition can be successfully fired from the ATAGS without requiring special modifications.

Mahindra too had obtained a licence from the government to produce small arms and associated ammunition, along with its specialisation in making armoured carriers and non-armoured mobility solutions for the Indian Army. The company also produces the Marksman, a military vehicle designed for urban warfare, and the Rakshak, an armored military utility vehicle. Queries sent to Bharat Forge and Mahindra, and the Ministry of Defence, did not elicit a comment.

The Indian Army had earlier issued a request for information seeking vendors to manufacture 23mm anti-drone ammunition under the "Make in India" initiative, which is being overseen by the Directorate General of Army Air Defence. The country's defence production has grown sharply since the launch of the "Make in India" initiative, reaching a record Rs 1.27 lakh crore in FY24. Currently, something like 65 per cent of defence equipment is now manufactured domestically, as compared to a 65-70 per cent import dependency around a decade ago.

The private sector including companies such as Bharat Forge, Mahindra and the Tata Group are playing an increasingly important role, contributing 21 per cent to total defence production in FY24, alongside fostering innovation and efficiency. India's defence industrial base, apart from the 16 PSUs, now includes over 430 licensed companies, and approximately 16,000 MSMEs.

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How RISAT-1B strengthens India's eye in the sky and enhances national security

Source: The Week, Dt. 09 May 2025,
URL: https://www.theweek.in/news/sci-tech/2025/05/09/how-risat-1b-strengthens-india-s-eye-in-the-sky-and-enhances-national-security.html

The Indian Space Research Organisation (ISRO) will launch RISAT-1B, also known as EOS-09, from the Satish Dhawan Space Centre in Sriharikota on May 18. This radar imaging satellite, set to soar aboard the PSLV-C61 at 6:59 am IST, marks a significant step in strengthening India's border surveillance and national security. Coming just days after Operation Sindoor, a bold military response to a deadly terrorist attack in Pahalgam, RISAT-1B's launch is both timely and critical. Equipped with advanced technology, this satellite promises to be a game-changer in India's fight against cross-border threats, offering hope and resilience in turbulent times.

RISAT-1B, a vital tool in India's defence arsenal

The satellite RISAT-1B is no ordinary satellite and carries a C-band synthetic aperture radar (SAR), which allows it to capture high-resolution images of the earth's surface in all weather conditions, day or night. Unlike optical satellites that struggle with clouds or darkness, RISAT-1B's radar can penetrate these barriers, making it ideal for monitoring sensitive border areas like Jammu and Kashmir. This capability is vital for detecting infiltrations, tracking suspicious movements, and supporting anti-terrorist operations. With tensions along India's borders remaining high, the satellite's ability to provide continuous, reliable intelligence is a strategic asset to the security forces.

"RISAT-1B, with its advanced imaging, will enhance India's ability to monitor terrorist activities and ensure swift responses to potential threats. It builds on the legacy of earlier RISAT satellites, which played key roles in operations like the 2016 surgical strikes, proving their worth in safeguarding the nation. India's RISAT series has long been a cornerstone of its security strategy. Launched after the 2008 Mumbai attacks, the series was designed to bolster border surveillance and deter infiltration. Satellites like RISAT-2BR1, launched in 2019, offered resolutions as fine as 0.35 meters, enabling security forces to identify objects with remarkable clarity," explained space expert Girish Linganna.

Experts point out that though specific details about RISAT-1B's resolution are not public, it is expected to match or surpass its predecessors, ensuring even sharper imagery. This precision is crucial for planning operations and maintaining vigilance in areas prone to insurgent activity, making RISAT-1B a vital tool in India's defence arsenal.

Unlike traditional optical cameras that rely on visible light, SAR cameras on RISAT-like satellites can penetrate dense cloud cover and operate in any lighting conditions.

"This capability is a game-changer for border areas where surveillance is often hindered by fog, rain, or darkness. High-resolution radar images can detect even minor changes such as fresh soil disturbances, new encampments, or vehicular movement providing actionable intelligence that ground patrols or conventional surveillance tools might miss. This ensures round-the-clock vigilance in remote and inaccessible areas and significantly enhances India's border control capabilities," remarked Srimathy Kesan, founder and CEO of Space Kidz India.

What are RISAT-1B's features?

RISAT-1B features five distinct imaging modes, offering the flexibility to switch between ultra-high-resolution imaging of up to 1 meter for detecting small objects and broader scans for large-area observation. This adaptability allows it to serve both military and civilian purposes.

"In the defence domain, it can identify unauthorised border activities, track infiltration routes, and detect hidden structures like tunnels and bunkers. Civilian applications include flood mapping, cyclone monitoring, soil moisture analysis, and crop health assessment—critical for disaster response and agricultural planning," added Kesan.

The radar's hybrid polarimetry adds further advantage by distinguishing between natural terrain and man-made objects, improving detection accuracy in areas where camouflage and terrain blending are common tactics.

Beyond security, RISAT-1B reflects India's growing prowess in space technology. The satellite's indigenous SAR technology reduces reliance on foreign systems, ensuring that our surveillance capabilities remain sovereign and secure. ISRO's ability to deliver such advanced systems highlights India's scientific achievements and its commitment to self-reliance.

However, experts note that continuous border monitoring requires multiple satellites in orbit. "At least four RISAT satellites are needed for daily coverage of critical areas, and RISAT-1B's addition brings India closer to this goal, strengthening its strategic posture," added Linganna.

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Science & Technology News

TDB-DST launches theme for National Technology Day 2025

Source: Press Information Bureau, Dt. 10 May 2025,
URL: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2128090

The Technology Development Board (TDB), under the Department of Science and Technology (DST), Government of India, today unveiled the official theme for National Technology Day 2025 — "YANTRA – Yugantar for Advancing New Technology, Research & Acceleration."

The word YANTRA, deeply rooted in India's scientific and cultural heritage, represents not just mechanical ingenuity but also symbolic power — of systems, synergy, and scalable solutions. Yugantar, meaning an epochal shift, is emblematic of the country's momentum in transitioning from technology adaptation to global technology leadership.

National Technology Day commemorates the momentous events of 11th May 1998, when India conducted successful nuclear tests under Operation Shakti, and saw the maiden flight of the indigenously developed Hansa-3 aircraft. In recognition of these achievements, then Prime Minister Sh. Atal Bihari Vajpayee declared 11th May as National Technology Day.

Over the years, National Technology Day has evolved into a flagship occasion for honouring scientific excellence, showcasing industrial innovations, and reinforcing the partnership between science, society, and industry. This year's celebrations will be held on 11th May 2025 under the aegis of TDB-DST. The event will bring together policymakers, scientists, technocrats, industry leaders, academic institutions, and startup founders to deliberate on accelerating India's technological journey through deep-tech, precision engineering, and transformative R&D.ware.One specific example is the Medipix chips developed for a detector at the LHC, which are now used across multiple areas in medical imaging and material science.

For the past 70 years, CERN has served as a fantastic model for peaceful and efficient international collaboration. Beyond its astonishing scientific output, it has also produced significant advances in

engineering that have spread through society.Building the FCC will be an investment in both technology and curiosity.

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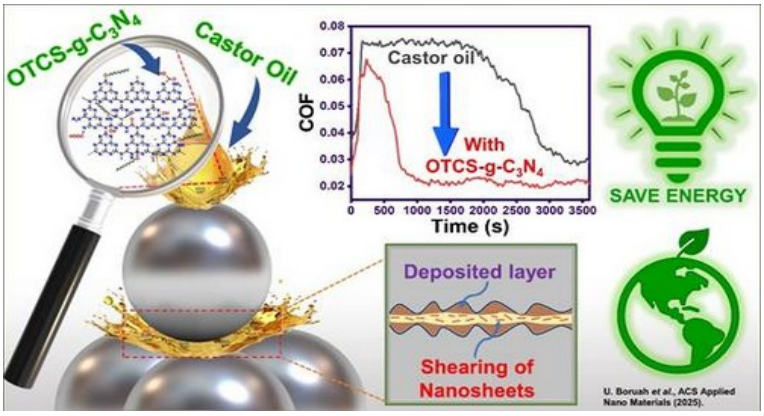
Researchers develop eco-friendly lubricant with superior performance

Source: Press Information Bureau, Dt. 09 May 2025,
URL: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2127947

Scientists have developed an environmentally friendly lubricant formulation that significantly enhances friction reduction, wear resistance, and overall performance. This advancement offers a sustainable alternative to conventional lubricants, addressing both efficiency and environmental concerns.

Lubrication reduces friction and wear in machinery, ensuring efficiency and longevity. Conventional mineral or synthetic oil-based lubricants pose environmental risks, driving the demand for sustainable alternatives.

In order to address this issue, researchers at the Institute of Advanced Study in Science and Technology (IASST), Guwahati, an autonomous institute of Department of Science and Technology, formulated a lubricant formulation by integrating surface-modified graphitic carbon nitride (g-C3N4) into bio-based castor oil.



Schematic illustration of Surface-Modified Graphitic Carbon Nitride as a High-Performance Additive in Bio-Based Oils

The group led by Prof. Devasish Chowdhury, along with Ujjibit Boruah, Inspire JRF, Bitupan Mohan, UGC-JRF and Dr. Nabajit Dev Choudhury from ASTU enhanced the compatibility of the lubricant with the oil by chemically modifying the g-C3N4 nanosheets using octadecyltrichlorosilane (OTCS), resulting in improved dispersibility and stability.

Study of friction, lubrication, and wear of interacting surfaces in relative motion (tribological evaluations) demonstrated remarkable improvements—reduction of friction by around 54 %, and decrease of wear volume by 60.02% compared to castor oil alone. The lubricant also exhibited a higher load-bearing capacity and greater thermal stability, with the oxidation onset temperature

rising from 320°C to 339°C demonstrating the efficiency of developed lubricating formulation. Furthermore, toxicity assessments confirm minimal formation of free radicals (more generation of free radical will lead to further secondary reactions) making the formulation safe for environmentally sensitive applications.

"This sustainable lubricant formulation not only enhances mechanical performance but also aligns with global efforts toward green and efficient lubrication technologies," said Prof. Chowdhury. The findings were recently published in ACS Applied Nano Materials.

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To boost security, ISRO to launch Earth-watching satellite on May 18

Source: The Tribune, Dt. 13 May 2025,
URL: https://www.tribuneindia.com/news/india/to-boost-security-isro-to-launch-earth-watching-satellite-on-may-18/

The Indian Space Research Organisation (ISRO) will launch the PSLV-C61 mission carrying satellite RISAT-1B, also known as EOS-09, from the Satish Dhawan Space Centre in Sriharikota on May 18. The significance of the launch is important in the context of tensions between India and Pakistan.

Equipped with a C-band synthetic aperture radar, EOS-09 will be capable of capturing high-resolution images of Earth's surface under all weather conditions, day or night. The imaging will be helpful in applications such as national security and natural disasters among others. The EOS-09 satellite, weighing around 1,710 kg, will join India's growing constellation of Earth observation assets, addressing the need for expanded real-time coverage across the country's vast territory.

V Narayanan, ISRO Chairman, has also underscored the importance of deploying additional satellites to bolster national security and support critical infrastructure.

Speaking at the fifth convocation ceremony of the Central Agricultural University near Agartala, he said 10 satellites were engaged round the clock to ensure the safety and security of the country's citizens.

"If we want our country to be safe, we have to do it through satellites. We have to monitor our seashore area of 7,000 km. We can't get many things done in the absence of satellite and drone technology," he said.

June will see the highly anticipated launch of the NISAR satellite aboard the GSLV-F16. This NASA-ISRO collaboration aims to study Earth's ecosystems and natural hazards through dual-frequency radar data, combining NASA's L-band payloads with ISRO's S-band contributions. The LVM3-M5 mission, scheduled for July, will cater to a commercial contract with AST SpaceMobile Inc, USA, launching BlueBird Block-2 satellites under NewSpace India Limited's commercial programme.

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India will share Gaganyaan feats with world: ISRO astronaut Angad Pratap

Source: The Tribune, Dt. 10 May 2025,
URL: https://www.tribuneindia.com/news/india/india-will-share-gaganyaan-feats-with-world-isro-astronaut-angad-pratap/

Group Captain Angad Pratap, one of the four astronauts selected for India's maiden human spaceflight mission, Gaganyaan, on Friday talked about his journey of becoming an astronaut and getting to represent the entire humanity.

During a panel discussion at the Global Space Exploration Conference (GLEX)-2025, Pratap said he had served in the Indian Air Force (IAF) for 16 years, and did not know a lot about the astronaut community when he had applied for the selection.

"But I knew that I would become a humble human being and represent entire humanity if I could become an astronaut. In the end, I would become more human," he said.

He added that he had an inkling of having a bright opportunity to develop capabilities academically and learn a lot about collaborating with people across all kinds and religions.

Pratap further said that it indeed was a big thing for him to be a part of the space programme, which is being single-handedly spearheaded by India.

"Whatever we achieve in this journey, we want to share with the world. The Indian Space Research Organisation has telescoped a lot of activities, wherein we can see a human spacecraft programme going on, docking being proven. Meanwhile, capabilities to go to the moon and come back is in progress. We also have Bhartiya Antriksh Station (BAS) programme being built in parallel and to top it up the next generation launch vehicle, which will be able to carry heavier load and pave bigger paths for space technology, underway," Pratap elaborated.

Wing Commander Rakesh Sharma (retd), who was the first Indian to go to space, said it had been 40 years since he went to space. "Today, India is prepared to see Angad and his colleagues in space. This is part of the success that ISRO has achieved in these years," he said.

Elaborating on his key takeaway in space, Sharma said, "Everybody who has been to space has experienced the overview effect. On the first day, you look at your country and see there are no boundaries. You see earth as a single entity and then you see the ongoing degradation, which wakes you to environmental degradation."

"I saw a part of the Myanmar forest going in flames and the plume of smoke was moving east across many other countries," he recalled.earch and testing facilities and, improving cross-linkages with higher educational institutes.

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U.S. firm Vast keen to use Indian rockets for rides to its planned space station

Source: The Hindu, Dt. 12 May 2025,
URL: https://www.thehindu.com/business/Industry/us-firm-vast-keen-to-use-indian-rockets-for-rides-to-its-planned-space-station/article69563747.ece

U.S.-based company Vast, planning to launch the world's first commercial space station next year, has evinced interest in using Indian rockets to transport crew members to its orbital laboratory.

Vast CEO Max Haot met the Indian Space Research Organisation (ISRO) leadership team on the sidelines of the Global Space Exploration Conference here to discuss possible collaborations in the area of space technology.

The space-habitation company is in the race to build a space station that will be the successor to the International Space Station, which will be retired by 2031.

The California-based company plans to launch Haven-1, a single-module space station, on a SpaceX Falcon 9 rocket in May 2026.

"Right now, we are on track with our launch for May 2026," Mr. Haot told PTI in an interview.

Vast plans to conduct a series of tests on the space station, before flying astronauts to the orbital laboratory by July next year. The first module of Haven-2, a much larger space station, is expected to be launched in 2028.

Mr. Haot is excited about India's Gaganyaan project, which plans to undertake a human spaceflight by early 2027, and keen to host science payloads on the space station.

"We are interested in flying payloads in science from India. The other interest we have is the possibility of using Gaganyaan rockets as a transport service for our space station," he said.

India's heavy-lift Launch Vehicle Mark-III is scheduled to take the Gaganyaan mission to a low-earth orbit by early 2027. The LVM-3 rocket has been used for commercial missions, such as the launching of OneWeb satellites in orbit.

In 2023, the National Aeronautics and Space Administration (NASA) signed a five-year, unfunded Space Act Agreement (SAA) with Vast, with the stated purpose of helping the company's "concept maturation and eventual implementation of space station modules".

The Haven-1 spacecraft has a 45-metre-cubed volume and is designed to support up to four crew members for missions of an average of two weeks in length.

It consists of four crew quarters for sleeping, several mid-deck lockers for science modules, a common area with a deployable table and multiple crew interfaces.

"Right now, we are solely focused on the SpaceX offering, but we are interested to hear whether there will be a competitive, reliable, safe option that we can use to bring our customers using the Gaganyaan vehicle to our space station," Mr. Haot said.

As India plans to have its own space station, Vast is also open to collaboration with the ISRO for the use of Haven facilities.

“Space is one of the most amazing collaborative fields in the world. And so, we are extremely open to ideas. Some of the ideas that were being discussed is, you know, maybe we can offer access to our space station but also get access to that (India’s) space station and share capacity or share size,” Mr. Haot said.

“We definitely see a lot of opportunities if, obviously, India and the ISRO welcome us to collaborate, especially as our two countries are politically very friendly,” he said.

Mr. Haot said the two other human-spaceflight-capable countries — Russia and China — are not in the same acceptable region for the current U.S. politics.

“So that creates a unique situation where we might have two human spaceflight capable countries that can work together,” Mr. Haot said.

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