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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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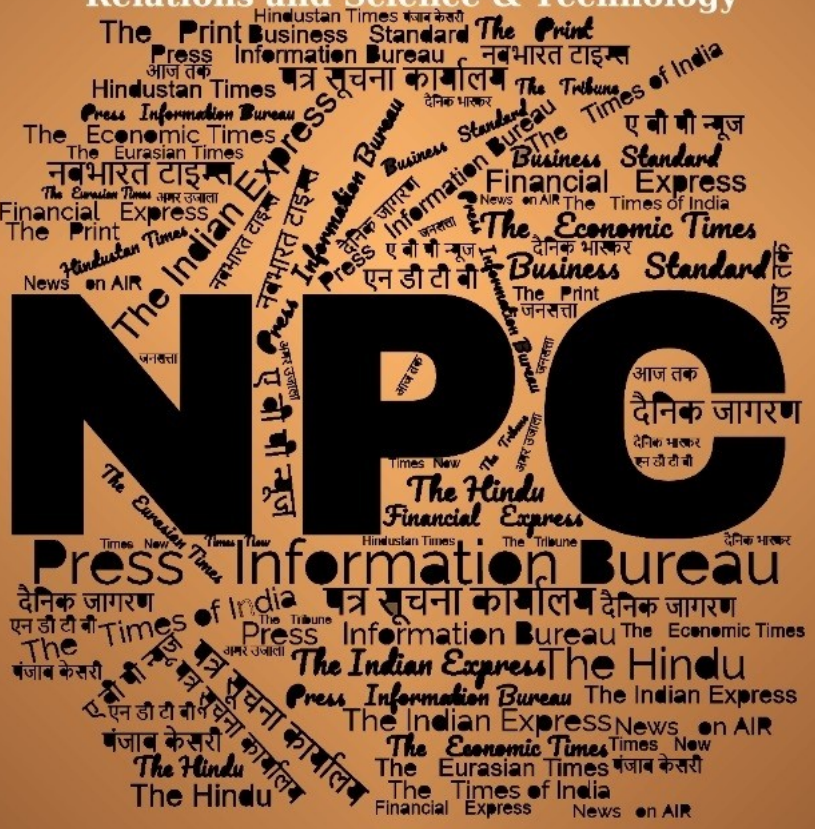

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DRDO News

DRDO's combat parachute pushes limits; freefall jump carried out from 27,000 feet

Source: The Week, Dt. 14 Mar 2025,
URL: https://www.theweek.in/news/defence/2025/03/14/drdos-combat-parachute-pushes-limits-freefall-jump-carried-out-from-27000-feet.html

In a major achievement, the combat freefall jump of military combat parachute system (MPCS) developed by Aerial Delivery Research and Development Establishment (ADRDE), a laboratory of the Indian Defence Research and Development Organisation (DRDO), was carried out recently.

MCPS is a sophisticated parachute system designed for military operations, particularly for special forces. It allows paratroopers to jump from aircraft with a combat load, deploy their parachutes at predetermined altitudes, and navigate and land safely.

In a significant achievement, Combat freefall jump of Military Combat Parachute System developed by ADRDE, Agra was carried from altitude of 27000ft with full combat load making it only parachute system capable of deployed above 25000ft currently in use by Indian armed forces pic.twitter.com/3AuFwP1HGz

— DRDO (@DRDO_India) March 13, 2025

The parachute system can be used in High Altitude High Opening (HAHO), High Altitude Medium Opening (HAMO), and High-Altitude Low Opening (HALO) modes, depending on the operational requirements.

In a tweet, the DRDO announced that the freefall jump was done from an altitude of 27,000ft with a full combat load, making it the only parachute system capable of being deployed above 25,000ft currently in use by Indian armed forces.

The jump was carried out by Wing Commander Vishal Lakhesh VM(G), MWO R J Singh, MWO A. A. Baidya demonstrating the effectiveness of the indigenous combat parachute system.

"MCPS offers improved tactical features, including a lower rate of descent and enhanced steering capabilities. It enable paratroopers to jump from aircraft and deploy their parachutes at predetermined altitudes, navigate and safe landing to designated areas," the tweet from DRDO said.

"The system is engineered in such a way that apart from the Army, Air Force and Navy, the special frontier force could operate. More than 350 trials were executed by ADRDE and Paratrooper Training School (PTS), Air Force, Agra. The system was commissioned in 2023," Times of India had quoted Gyasuddin Quraishi, a scientist and PRO of ADRDE, as saying.

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Defence News

Defence Strategic: National/International

INS Ranvir Participates In Exercise Bongosagar 25 And Indian Navy - Bangladesh Navy Corpat

Source: Press Information Bureau, Dt. 13 Mar 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2111292

The India-Bangladesh Naval Exercise Bongosagar 2025 and Coordinated Patrol was conducted in Bay of Bengal this week. The exercise saw participation of INS Ranvir from Indian Navy and BNS Abu Ubaidah from Bangladesh Navy.

The exercise enhanced interoperability between the two navies, facilitating collaborative responses to shared maritime security challenges.

The exercise involved a range of complex operations encompassing surface firing, tactical manoeuvres, underway replenishment, Visit- Board-Search- Seizure (VBSS) cross boarding, communication drills, quiz for Ops team and Junior officers on professional topics and steam past.

The exercise provided the opportunity for both navies to develop closer links in tactical planning, coordination and information sharing for undertaking seamless maritime operations. The exercise has strengthened coordination and confidence between the two navies thereby improving the ability to undertake coordinated operations and respond swiftly and effectively against emerging threats at sea.

The enhanced synergy of naval operations between the two navies is the testament to the shared commitment of countering global security challenges towards security and stability in the region promoting Security And Growth for All in the Region (SAGAR) initiative of India.

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14th meeting of ADMM-Plus Experts Working Group on Counter-Terrorism to be held in New Delhi

Source: Press Information Bureau, Dt. 16 Mar 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2111580

The 14th meeting of ASEAN Defence Ministers' Meeting-Plus (ADMM-Plus) Experts Working Group (EWG) on Counter-Terrorism will be held in New Delhi from March 19 to 20, 2025. India and Malaysia will co-chair the ibid meeting. Delegations from 10 ASEAN members (Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Vietnam, Singapore and Thailand) and eight dialogue partners (Australia, New Zealand, RoK, Japan, China, USA and Russia) along with Timor Leste and ASEAN Secretariat will be participating in the meeting.

India will co-chair the EWG on Counter-Terrorism for the first time. On March 19, 2025, Defence Secretary Shri Rajesh Kumar Singh will deliver the keynote address during the opening ceremony.

This will be the first meeting for activities planned for EWG on Counter-Terrorism for the ongoing cycle from 2024-2027. Discussions will focus on evolving a robust and comprehensive strategy

designed to tackle the evolving threat of terrorism and extremism. The meeting aims to share the on-ground experience of the Defence Forces of ASEAN and its dialogue partners. It will lay the foundation for the activities/exercises/seminars/workshop planned for the cycle 2024-2027.

The ADMM-Plus serves as a platform for practical cooperation amongst the participating countries' defence establishments. It currently focuses on seven areas of practical cooperation – Counter-Terrorism, Maritime Security, Humanitarian Assistance and Disaster Management, Peacekeeping Operations, Military Medicine, Humanitarian Mine Action and Cyber Security. EWGs have been established to facilitate cooperation in these areas.

The EWGs are each co-chaired by one ASEAN member state and one dialogue partner following a three-year cycle. The task of the co-chairs is to lay down the objectives, policy guidelines and directions for the EWG for the three-year cycle at the commencement of the chairmanship, conduct of regular EWG meetings (minimum two in a year) and an exercise of any form (Table-Top/Field Training/Staff/Communication etc.) for all member nations in the third year to test the progress made in practical cooperation during the three-year cycle.

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INS Imphal Completes Visit To Port Louis For National Day Celebrations

Source: Press Information Bureau, Dt. 15 Mar 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2111518

INS Imphal completed her port visit to Mauritius and left Port Louis on 14 Mar 25. The ship was at Mauritius to participate in the 57th Mauritius National Day celebrations, representing India with a marching contingent, the Indian Navy band and flypast by two MH 60R helicopters. Shri Narendra Modi, Hon'ble Prime Minister was the Chief Guest at the spectacular parade.

During the port visit, the ship also held several professional interactions, cultural engagements, sports fixtures and community outreach activities to further strengthen the robust bonds between the two countries.

Training capsules were conducted onboard the ship for Mauritius National Coast Guard (NCG) personnel on practical aspects of harbour and sea watchkeeping, VBSS (Visit, Board, Search and Seizure), force protection, shipborne helicopter operations, firefighting and damage control.

A medical camp for the elderly at Gayasingh Ashram was also conducted by the ship's crew.

The ship was opened to the public on 12 March on the occasion of Mauritius National Day and saw over 1,300 visitors.

The ship's crew visited key security establishments at Port Louis, including the Mauritius Police and NCG Headquarters.

Capt Kamal K Choudhury, the ship's Commanding Officer, called on key dignitaries and high-ranking officials of the Mauritius Government and Mauritius Police Force (MPF).

The ship hosted a deck reception along with the High Commission of India, that was attended by senior ministers and officials from Mauritius and members of local diplomatic corps.

After her departure from Port Louis, INS Imphal undertook a bilateral Passage Exercise and Joint EEZ surveillance with MCGS Victory, to consolidate the synergy and collaboration between the Indian Navy and the National Coast Guard of Mauritius.

This landmark deployment of INS Imphal provided a renewed impetus to the robust bilateral ties between the two nations and reaffirmed India's commitment to act swiftly as the 'First Responder' and the 'Preferred Security Partner' to address maritime challenges in the IOR.

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Keel Laying Of Second Fleet Support Ship For Indian Navy

Source: Press Information Bureau, Dt. 13 Mar 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2111089

Keel Laying ceremony of second of the five Fleet Support Ships (FSS) was held at M/s L&T Shipyard, Kattupalli on 12 Mar 25, in the presence of VAdm Rajaram Swaminathan, Controller Warship Production & Acquisition and senior officials from Indian Navy, Hindustan Shipyard Limited and M/s L&T. The Indian Navy had signed a contract with HSL for acquisition of five Fleet Support Ships (FSS) in Aug 2023, with delivery commencing mid-2027. Showcasing the strength of public-private partnership, HSL has contracted construction of two FSS to M/s L&T Shipyard, Kattupalli to effectively utilise country's shipbuilding capacity and meet stringent timelines for delivery.

On induction, the FSS will bolster the Blue Water capabilities of the Indian Navy through replenishment of the Fleet ships at sea. These ships, with a displacement of more than 40,000 tons, will carry fuel, water, ammunition and stores enabling prolonged operations at sea, thus enhancing the Fleet's reach and mobility. In their secondary role, the ships will be equipped for Humanitarian Aid and Disaster Relief (HADR) operations for evacuation of personnel and expeditious delivery of relief material during natural calamities.

With a completely indigenous design and sourcing of the majority of the equipment from indigenous manufacturers, this project will boost the Indian Shipbuilding Industry and is in consonance with GoI initiatives of Aatmanirbhar Bharat, Make in India and Make for the World.

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India's defence sector poised for significant growth amid global shifts: Report

Source: The Economic Times, Dt. 15 Mar 2025,
URL: https://economictimes.indiatimes.com/news/defence/indias-defence-sector-poised-for-significant-growth-amid-global-shifts-report/articleshow/119031896.cms

India's defence sector is poised for substantial growth amid global shifts according to a report by Nuvama.

Defence exports are expected to reach Rs 203 billion in FY25, with a government target of Rs 500 billion by FY29.

European defence orders could begin flowing as early as the first half of FY26, marking a major milestone for the sector. Given Europe's manufacturing constraints, Indian defence companies are well-positioned to capitalize on rising export opportunities.

Europe's limited local manufacturing capacity and workforce shortages are opening doors for Indian defence manufacturers to step in.

"Europe's defence expansion is constrained by limited local manufacturing capacity and skilled workforce shortages, especially in aerospace and missile supply chains. As a result, European nations are increasingly looking at partnerships and collaborations with Indian defence manufacturers" says the report.

On the domestic front, India is set for a substantial defence push. The government has announced plans to place Rs 1.5 trillion worth of large-scale defence orders by March 2025. This move, aimed at addressing slow ordering momentum in FY25, is expected to provide a significant boost to defence stocks.

The US decision to reduce military aid to Ukraine has exposed NATO's heavy reliance on American defence funding. Historically, the US has contributed around 70 per cent of NATO's total defence expenditure, averaging 3.4 per cent of its GDP over the past decade.

With the Pentagon proposing USD 50 billion in annual cuts, European nations are under pressure to enhance their own defence capabilities.

"The U.S. actions highlight Europe's potential weakness without the US support. Historically, only four out of 32 NATO members (excluding the U.S.) have met the 2 per cent GDP defence spending target. Meanwhile, the U.S. has contributed ~70 per cent of NATO's total defence expenditure, averaging 3.4 per cent of its GDP from 2014-24. With the Pentagon now proposing USD 50 billion in annual cuts, Europe faces mounting pressure to bolster its own defence capabilities," said the report

Defence exports of India touched a record Rs 21,083 crore in the FY2023-24, a growth of 32.5 per cent over the previous fiscal year when the figure was Rs 15,920 crore.

The figures indicated that defence exports grew by 31 times in the last 10 years as compared to FY 2013-14. The defence industry, including the private sector and DPSUs, have significantly contributed in achieving the highest-ever exports. The private sector and DPSUs contributed about 60 per cent and 40 per cent respectively.

With rising global defence demand and a strong domestic push, India's defence sector is at an inflection point, poised for robust growth in the coming years says the report.

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India vs China aerial warfare: How IAF plans to challenge the 5,000 km Chinese radar with Rs 2,906 crore mobile radar

Source: The Economic Times, Dt. 13 Feb 2025,
URL: https://economictimes.indiatimes.com/news/defence/india-vs-china-aerial-warfare-how-iaf-plans-to-challenge-the-5000-km-chinese-radar-with-rs-2906-crore-mobile-radar/articleshow/118973949.cms

India is taking a crucial step to enhance its air defence capabilities in response to China's expanding surveillance network. The Ministry of Defence (MoD) has signed a Rs 2,906 crore contract for the procurement of 18 ‘Ashwini’ Low-Level Transportable Radars (LLTRs) for the Indian Air Force (IAF). This deal, finalised with Bharat Electronics Ltd (BEL), marks a significant shift towards self-reliance in defence technology.

These LLTRs, designed and developed by the Electronics & Radar Development Establishment of DRDO, will be the first indigenous radar systems of their kind for the IAF, replacing previously imported equipment. The system is expected to strengthen India’s ability to track aerial threats, ranging from high-speed fighter jets to slow-moving drones and helicopters.

A Leap Towards Indigenous Defence Manufacturing

Defence Secretary Rajesh Kumar Singh, present at the contract signing, highlighted the strategic importance of this acquisition. An MoD official stated, “The Ashwini LLTR is an active electronically scanned phased array radar based on state-of-the-art solid-state technology. The radar is capable of tracking aerial targets from high-speed fighters to slow-moving targets such as UAVs or drones and helicopters.”

The move aligns with India's broader goal of reducing dependency on foreign defence manufacturers. The acquisition of these radars will not only bolster operational preparedness but also serve as a catalyst for the development of India's defence-industrial ecosystem.

China's Expanding Radar Network: A Growing Threat?

China has been aggressively expanding its radar capabilities, posing a direct challenge to India's strategic defence planning. According to a recent report by the China Aerospace Studies Institute (CASI), the People's Liberation Army (PLA) has deployed large phased-array radars (LPARs) across the country, including a newly reported system in Yunnan province near the Myanmar border. This radar, with a range exceeding 5,000 km, can monitor deep into Indian territory and track missile tests.

The PLA's radar development is part of a broader strategy to create an extensive, networked air defence system. The CASI report noted "China's large air defense radar industrial base produces comprehensive detection capabilities at all heights and ranges, and its newest systems appear to be on the international cutting edge of radar technology."

Implications for India

This development raises significant concerns for India, particularly regarding strategic weapons testing at Dr APJ Abdul Kalam Island, a critical site for evaluating intercontinental ballistic missiles like the Agni-V. The Yunnan-based radar's ability to observe missile launches in real time gives China a crucial intelligence advantage, allowing it to analyse missile speeds, trajectories, and patterns.

Beyond missile tracking, the radar enhances China's surveillance over vital maritime zones, including the Bay of Bengal and the Malacca Strait—key areas for India's naval operations and trade routes. With existing Chinese radar stations in Korla and Xinjiang already monitoring northern India, the Yunnan facility further expands Beijing's surveillance reach.

India's Next Move

To counter this challenge, the IAF is considering the deployment of specialised mountain radars capable of peering deep into Chinese territory. These systems will be crucial along the 3,488-km Line of Actual Control (LAC), where China has significantly upgraded its air bases and air defence networks since the 2020 Ladakh standoff.

Meanwhile, the Indian Navy is also focusing on indigenous technological advancements. Admiral Dinesh K Tripathi recently toured BEL's facilities, reviewing advanced defence systems, including Medium and Long-Range Surface-to-Air Missile (MRSAM/LRSAM) projects. His visit underscores the Navy's push towards enhancing its capabilities with homegrown technology.

The Global Context: How China's Radar Stacks Up

China's LPAR is being compared to the US PAVE PAWS (Precision Acquisition Vehicle Entry Phased Array Warning System), a Cold War-era radar designed for long-range missile detection. While exact specifications remain undisclosed, analysts suggest China's system offers comparable

—if not superior—capabilities. Beijing has been investing in phased-array radar technology since the 1970s, steadily improving its missile defence and early warning networks.

According to the CASI report, China's advancements include next-generation radar technologies like cognitive radar, quantum radar, and artificial intelligence (AI)-driven detection systems. These innovations aim to enhance stealth detection, speed up threat identification, and improve resistance against electronic warfare.

"The PLA appears able to network air defense radar platforms of multiple types and capabilities at least at the brigade level, and can likely fuse information from air defense radars across the country into a centralized detection network," the report stated.

China's rapid advancements in radar technology present a formidable challenge, but India is not standing still. The push towards indigenous radar systems like Ashwini is a vital step in securing airspace and reducing reliance on foreign technology. While the deployment of China's 5,000 km radar system in Yunnan poses fresh surveillance threats, India's evolving defence strategy—centred around homegrown capabilities—aims to level the playing field.

As military tensions persist, especially along the LAC, radar and surveillance technology will play a decisive role in shaping the region's security landscape. The question remains: will India's defence ecosystem develop fast enough to match the scale and speed of China's military advancements?

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China delivers second of eight modern submarines to Pakistan navy

Source: The Economic Times, Dt. 16 Mar 2025,
URL: https://economictimes.indiatimes.com/news/defence/china-delivers-second-of-eight-modern-submarines-to-pakistan-navy/articleshow/119077614.cms

China has delivered a second new submarine, equipped with state-of-the-art weapons and sensors, to Pakistan as part of its efforts to beef up the navy of its all-weather ally to back its growing presence in the Arabian Sea and India's backyard - the Indian Ocean. The Hangor-class submarine, which is part of the eight such submarines to Pakistan in a deal with around USD five billion, was launched in Wuhan, China's Hubei Province, official media here reported on Sunday.

This is in addition to four modern naval frigates China supplied to Pakistan in the last few years as part of its efforts to boost the naval strength of Pakistan, amid the Chinese navy's steady expansion in the Arabian Sea, where it is developing the Gwadar port in Balochistan, and the Indian Ocean.

A Chinese expert told the state-run Global Times that the new submarine has a strong comprehensive combat capability to become a mainstay for the Pakistan Navy.

Under an agreement, Pakistan will acquire eight Hangor-class submarines from China. Four of them will be built in China, while the remaining will be constructed in Karachi under a transfer of technology program, the Pakistan Navy said in a press release.

The submarines will be fitted with cutting-edge weapons and sensors, enabling them to engage targets at standoff ranges.

Zhang Junshe, a Chinese military affairs expert, told the Global Times that Hangor-class submarines possess strong underwater combat capabilities and are equipped with an air-independent propulsion system that will give the boat strong, sustained stealth capability, manoeuvrability and endurance.

Its firepower includes torpedoes, anti-ship missiles and mine-laying capabilities, along with advanced underwater detection systems, he said.

According to a recent report by the Stockholm International Peace Research Institute (SIPRI), China has supplied 81 per cent of Pakistan's advanced military systems in the past five years, making Pakistan its biggest arms importer.

Pakistan's military acquisitions amounted to 63 per cent of China's total arms exports, with a total value of USD 5.28 billion in the last five years.

Pakistan bought more advanced and diverse systems from China from 2020 to 2024, such as long-range reconnaissance drones and Type 054A guided-missile frigates, the SIPRI report said.

Some of Pakistan's key orders in the past five years include the country's first spy ship, the Rizwan, more than 600 VT-4 battle tanks, and 36 J-10CE 4.5-generation fighters, according to the SIPRI database.

China supplied the first delivery of multirole J-10CE fighter jets to Pakistan Air Force in 2022, adding to its JF-17 fighters jointly manufactured by both countries.

The fourth-generation JF-17 was jointly developed by Pakistan Aeronautical Complex and China's Chengdu Aircraft Industry Group, including the Block III version featuring an active electronically scanned array radar, which was inducted by the Pakistan Air Force in 2023.

Song Zhongping, a military commentator and former instructor of the Chinese military, told the Hong Kong-based South China Morning Post that China might also export its fifth-generation fighter jet, the J-35 the stealth multirole fighter, "if Pakistan requests it".

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Pravaig's all-terrain stealth vehicle undergoes military trials, gets iDEX recognition

Source: The Economic Times, Dt. 16 Mar 2025,
URL: https://economictimes.indiatimes.com/news/defence/pravaigs-all-terrain-stealth-vehicle-undergoes-military-trials-gets-idex-recognition/articleshow/119066511.cms

Bengaluru-based EV startup Pravaig's all-terrain stealth vehicle, Veer -- the world's first operational EV designed for tactical defense use -- has undergone military trials and won the prestigious iDEX award from the Ministry of Defence. "In a major step towards strategic autonomy, Pravaig has won the prestigious iDEX Award for its VEER Electric Tactical All-Terrain

Vehicle (E-TATV) -- a cutting-edge, highly stealthy vehicle designed for forward patrolling, reconnaissance, and ISR operations," Pravaig Dynamics said in a post on X.

Atima Corporation, a wholly-owned subsidiary of Pravaig, won the iDEX Award by the Defence Innovation Organisation (DIO), under the aegis of the Department of Defence Production in the Ministry of Defence, "for deepening India's sovereignty by building cutting-edge defence technologies and reinforcing the country's strategic autonomy."

The scheme for iDEX-Innovations for Defence Excellence was launched in May 2021 by DIO to foster innovation and technology development in the Defence sector. The mission is to build, own and operate India's defence technology.

The award is considered the first step towards induction into Indian Defence Services.

Pravaig said technology dependency on foreign entities proved to be an Achilles' heel for not just Ukraine, but even for India, as evidenced by the GPS denial by the US during the Kargil War.

The iDEX Award is conferred for deepening India's sovereignty by building cutting-edge defence technologies and reinforcing the country's strategic autonomy.

The mission is clear -- to ensure that India builds, owns, and operates its own advanced defence systems, free from external control.

Pravaig VEER is "built in India, for India", the firm said.

"With the Pravaig VEER, India is asserting its control over critical military technologies, ensuring full sovereignty over its national security infrastructure," it said.

VEER has class-leading stealth and is extremely powerful, military-grade and fully field-repairable. India will have complete data ownership with no foreign control.

The vehicle has been field tested at difficult terrains and altitudes.

"Pravaig builds products that leapfrog India's capabilities," it said.

The startup also manufactures high-precision batteries for EVs.

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Russia set to re-enter medium transport aircraft supply contest of IAF

Source: The Economic Times, Dt. 14 Mar 2025,
URL: https://economictimes.indiatimes.com/news/defence/russia-set-to-re-enter-medium-transport-aircraft-supply-contest-of-iaf/articleshow/118990907.cms

Russia is looking to re-enter a contest to supply medium transport aircraft (MTA) to the Indian Air Force, with sources saying it is keen to partner with Hindustan Aeronautics Limited (HAL) for the multi-billion dollar project.

India is looking for at least 80 of the MTA that are to replace the ageing An32 fleet, with plans in place to localise the production with an Indian partner, along with significant technology transfer.

Sources said that Russia has reinitiated talks, putting the IL276 on offer for the Air Force. Incidentally, Russia was the original partner for a programme to co-develop a transport aircraft for India. The project was, however, dropped late in 2015 after concerns were raised by the Indian side on the technologies on offer.

A key Indian concern at that point was the lack of a new generation engine with a full authority digital engine control system that was needed to give it adequate power to operate at challenging altitudes.

The MTA contest is heating up with global original equipment manufacturers keen to partner with Indian entities to offer the aircraft. Given its relatively large size - 80 aircraft are being contracted but the number is likely to go up - most major global companies have tied up with Indian partners.

As per current plans, the aircraft order will be given to an Indian company that will partner with a foreign manufacturer and produce the planes locally. There is also likely to be deeper technology transfer than the C295 transport aircraft deal in which Tata has partnered with Airbus for local production.

Airbus is seeking to enter the contest with its A400M and is currently in talks to identify local partners. Lockheed Martin has the C130J on offer and has announced a partnership with Tata. Embraer is a strong contender for the programme with its C390 Millennium and has announced a partnership with Mahindra Defence for the contest.

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Defence Minister Rajnath Singh to meet US Intelligence chief Tulsi Gabbard today

Source: ANI News, Dt. 17 Mar 2025,
URL: https://www.aninews.in/news/world/asia/defence-minister-rajnath-singh-to-meet-us-intelligence-chief-tulsi-gabbard-today20250317102334/

The Defence Minister and the American National Intelligence Chief in the South Block and discuss the issues of mutual interest for the two sides, defence ministry officials said.

National Security Advisor Ajit Doval had held a meeting with Tulsi Gabbard in New Delhi on Sunday. According to sources, Tulsi Gabbard met NSA Doval in New Delhi on Sunday evening, and they had a detailed discussion on several facets of the India-US relationship.

Tulsi Gabbard is visiting India as a part of her multi-nation visit. The Asia leg of Gabbard's trip will culminate in an address on March 18 at the Raisina Dialogue, a multinational gathering of security officials in Delhi, to which Prime Minister Narendra Modi invited her.

There, Gabbard will hold bilateral meetings with Indian officials and officials from other countries, The New York Times reported, citing a Trump administration official.

Her visit to India follows Prime Minister Narendra Modi's visit to the US in February. During his visit, PM Modi met with Tulsi Gabbard and called her a "strong votary" of the India-US friendship.

Gabbard also called it an "honour" to welcome PM Modi and said she looks forward to continuing to strengthen the US-India friendship. This was PM Modi's first visit to the United States after Donald Trump assumed office for a second term.

As per the official website of Raisina Dialogue, Gabbard will participate in a keynote conversation with Samir Saran, President, ORF. The 10th edition of the Raisina Dialogue, being co-hosted by the Ministry of External Affairs in partnership with the Observer Research Foundation (ORF), will commence today.

PM Modi will inaugurate the Raisina Dialogue today, where the chief guest, New Zealand Prime Minister Christopher Luxon, will deliver the keynote address.

The Raisina Dialogue, set to be held in New Delhi from March 17-19, is India's premier conference on geopolitics and geoeconomics committed to addressing the most challenging issues facing the global community.

Nearly 3,700 attendees and over 800 speakers and delegates from around 130 countries worldwide will attend the Raisina Dialogue, according to the ORF statement.

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India to step on the gas for indigenous 5th gen fighter

Source: The Times of India, Dt. 17 Mar 2025,
URL: https://timesofindia.indiatimes.com/india/india-to-step-on-the-gas-for-indigenous-5th-gen-fighter/articleshow/119090404.cms

India plans to 'accelerate' the development and induction of its own ambitious fifth-generation stealth fighter jet, with a top-level committee now working to evolve a clear-cut strategy and production-cum-business model for the swing-role advanced medium combat aircraft (AMCA).

The committee chaired by defence secretary Rajesh Kumar Singh, which includes IAF vice chief Air Marshal S P Dharkar, secretary (defence production) Sanjeev Kumar and top officials from DRDO and Aeronautical Development Agency (ADA), is slated to submit its report next month.

This comes at a time when Pakistan is looking to acquire at least 40 J-35A stealth fifth-generation jets from China, which is now brandishing even sixth-generation prototypes.

China has already deployed its fifth-generation Chengdu J-20 jets at its airfields facing India like Hotan and Shigatse, as reported earlier by TOI.

Faced with this, coupled with the huge delay in production of the fourth-generation Tejas jets by Hindustan Aeronautics Limited (HAL), a source told TOI that the committee's aim is to "devise how best to get AMCA from the drawing board into the air by shrinking timelines and improving efficiency, including a good workable production-cum-business model with much greater private sector participation".

The committee will also consider the plan for indigenous development of a 110 kilonewton thrust-class engine to power the 25-tonne AMCA with foreign technology collaboration. Aero-engine majors like US General Electric, French Safran and British Rolls-Royce are in the fray for this.

The new panel was formed after another defence secretary-led committee chalked out a detailed roadmap for IAF's "all-round capability enhancement" to plug existing operational gaps in a time-bound manner. The report was presented to defence minister Rajnath Singh on March 3, as was then reported by TOI.

The PM-led cabinet committee on security in March last year had cleared the full-scale engineering development of five prototypes of the twin-engine AMCA at an initial cost of over Rs 15,000 crore. The AMCA, with the requisite thrust-to-weight ratio, advanced sensor fusion and stealth features like an internal weapons bay and "serpentine air-intake", however, will be ready for production only by 2035 at the earliest as per existing timelines. "It will be a challenge to compress timelines but a major effort has to be made due to IAF's expanding technological shortfalls," another source said, in the backdrop of IAF currently making do with just 30 fighter squadrons when 42.5 are authorised. At least eight more squadrons are slated for retirement over the next 10 years. IAF currently plans to induct seven squadrons (126 jets) of the expensive AMCA, which will also have AI-powered electronic pilot systems, netcentric warfare systems, integrated vehicle health management and the like. While the first two squadrons will be powered by GE-F414 engines in the 98 kilonewton thrust class, the next five will have 110 kilonewton engines.

In the interim, the dwindling numbers are to be progressively made up by induction of 180 Tejas Mark-1A fighters (for around Rs 1.2 lakh crore) and 108 more capable Tejas Mark-2 jets.

Parallelly, the long-pending project to manufacture 114 4.5-generation multi-role fighter aircraft (MRFA) with foreign collaboration as reported by TOI earlier.

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From importer to key player: 2024 saw India take centerstage in defence sector

Source: The Times of India, Dt. 13 Mar 2025,
URL: https://timesofindia.indiatimes.com/india/from-importer-to-key-player-2024-saw-india-take-centerstage-in-defence-sector/articleshow/116830230.cms

India’s defence sector in 2024 showcased significant progress in achieving self-reliance and gaining global recognition. With record-breaking indigenous defence production and exports, the nation transitioned from an importer to a key player in the global defence market. India commissioned new ships for its navy and added advanced aircraft to its air force. The country also saw the opening of its first privately owned military aircraft factory. Additionally, high-value contracts and strategic international collaborations strengthened India's defence capabilities, stressing its commitment to "Aatmanirbharta.”

Here are the top defence achievements of India in 2024:

Aatmanirbharta in defence: India's journey to self-reliance

Prime Minister Narendra Modi announced on India's 78th Independence Day that the country is moving toward "Aatmanirbharta" (self-reliance) in defence and becoming a global manufacturing hub. Speaking from the Red Fort on August 15, 2024, PM Modi said, “There was a time when the

majority of the defence budget was used to procure weapons/equipment from abroad, but his Government focused on indigenous manufacturing to make the nation self-reliant."

The Prime Minister commended the ministry of defence and the armed forces for promoting local manufacturing. This includes five "Positive Indigenisation Lists" outlining over 5,600 items to be sourced exclusively from Indian manufacturers. PM Modi stressed India's transition from a defence equipment importer to an exporter.

The ministry of defence reported record-high indigenous defence production in the 2023-24 financial year, reaching Rs 1,26,887 crore, a 16.7% increase compared to the previous year. Public sector entities contributed approximately 79.2% of this production, while the private sector accounted for the remaining 20.8%.

For example, the Indian Light Tank "Zorawar," developed by the Defence Research and Development Organisation (DRDO) and manufactured by Larsen & Toubro, successfully completed high-altitude firing trials. This followed successful desert trials in September 2024. The tank demonstrated accurate firing capabilities in both environments.The defence ministry aims to reach Rs 3 lakh crore in defence production by 2029.

Defence exports hit record high

India's defence exports reached a record high of Rs 21,083 crore (approximately US$2.63 billion) in the fiscal year 2023-24. This marks a 32.5% increase from the Rs 5,920 crore achieved in the previous fiscal year. Exports have grown 31 times over the last decade compared to the fiscal year 2013-14.

Private companies and Defense Public Sector Undertakings (DPSUs) contributed approximately 60% and 40% to these exports, respectively.

The ministry of defence simplified export procedures in May 2024, expanding the Open General Export License (OGEL) to cover more countries and items. An online portal now facilitates the sharing of export leads with Indian defence companies, disseminating 153 leads since January 1, 2024. The ministry also organized ten webinars and seminars with other countries to promote exports. DPSUs are setting up overseas offices, supported by a new streamlined procedure.

Defence minister Rajnath Singh expressed confidence that the target of exporting defence equipment worth Rs 50,000 crore by 2029 will be achieved.

PM Modi and Spain's PM launch India's first private military aircraft factory

Prime Minister Narendra Modi and Spanish Prime Minister Pedro Sanchez inaugurated India's first private military aircraft manufacturing facility in October. The Tata Aircraft Complex will produce C-295 transport aircraft, a joint project between Airbus Spain and Tata Advanced Systems Ltd.

The factory is expected to deliver its first "Made in India" C-295 in 2026. Of the 40 aircraft to be built in India, six of the 16 "fly-away" condition aircraft from Airbus Spain have already been delivered to the Indian Air Force.

“The C-295 aircraft factory reflects the new work culture of ‘New Bharat.’ From idea to execution, the speed with which Bharat operates today is evident here,” PM Modi said, predicting future global exports of the aircraft.

This project is expected to generate thousands of jobs. PM Modi also stressed the potential for civilian aircraft production at the facility, citing recent orders by Indian airlines for 1,200 new planes. He emphasised the expansion of air connectivity to smaller Indian cities and India's ambition to become an aviation hub.

Sanchez stressed Spain's reliability as a partner. Both leaders praised the C-295 project as a symbol of growing defence cooperation and encouraged further joint ventures between the two countries’ defence industries.

Multi-billion dollar deal with US for predator drones

India signed a deal with the US government for 31 MQ-9B predator drones, costing Rs 28,000 crore (US$3.3 billion), in October. A separate Rs 4,350 crore (US$520 million) agreement with General Atomics will establish a maintenance, repair, and overhaul (MRO) facility in India.

The first drone is expected to be delivered by January 2029, with all 31 delivered by October 2030. An official told TOI, “Under the deal, the first MQ-9B high-altitude long-endurance (HALE) drone will be inducted by Jan 2029, with all the 31 being delivered in batches by Oct 2030. The `birds’ will provide a quantum jump in the ISR (intelligence, surveillance, and reconnaissance) capabilities of our armed forces.”

The Navy will receive 15 Sea Guardian drones, while the Army and Air Force will each get eight Sky Guardians. These drones, equipped with Hellfire missiles, GBU-39B guided bombs, and other weapons, will enhance India's surveillance capabilities, especially in the Indian Ocean Region, where China's presence has grown.

General Atomics will partially assemble 21 of the drones in India and provide logistical support for eight years. Although no technology transfer is included, the company will offer expertise to India's defence research and development organisation (DRDO) to develop similar drones.

The official addressed cost concerns and the drones' effectiveness: “The MQ-9Bs we will get are the latest variant capable of launching their weapons from long stand-off distances,” he said.

These drones can fly for 30-40 hours at high altitudes and are considered more advanced than Chinese drones. India plans to deploy them at command centers focused on the Indian Ocean Region and land borders. This purchase represents a major defence deal with the US, following acquisitions like C-17 Globemaster aircraft and P-8I maritime patrol aircraft.

Approval of 52 new surveillance satellites

India will launch 52 new spy satellites to enhance its surveillance capabilities, the government announced in October. The cabinet committee on security, led by Prime Minister Narendra Modi, approved the third phase of the space-based surveillance (SBS-III) project.

The project, estimated at Rs 27,000 crore, will span five years. These satellites will monitor India's land and sea borders, focusing on areas of concern with neighboring countries Pakistan and China, including Chinese activity in the Indian Ocean.

This new network will complement existing Indian satellites like Risat, Cartosat, and the Gsat-7 series. The SBS program began in 2001 with four satellites launched. A second phase in 2013 added six more.The new satellites will incorporate artificial intelligence (AI) for communication and data gathering.

Induction of first C-295 tactical aircraft

The Indian Air Force (IAF) inducted its first C-295 transport aircraft in September, marking a significant upgrade to its airlift capabilities. Defence minister Rajnath Singh highlighted the role of the defence and aerospace sectors in India's self-reliance during the induction ceremony at Hindon Air Base near Delhi.

Nicknamed "The Rhino," the C-295 will be based in Vadodara, Gujarat. India signed a deal for 56 planes two years ago, costing Rs 21,935 crore. Airbus will deliver the first 16 aircraft by 2025, while the remaining 40 will be built in India at a new Tata-Airbus facility in Vadodara. This is the first instance of a private company producing military aircraft in India. Indian-made C-295 production will run from September 2026 to August 2031.

The C-295 will replace the older HS-748 Avro aircraft. “This medium-lift tactical aircraft is capable of taking off and landing from unprepared landing grounds. It will replace the HS-748 Avro aircraft,” Singh said.

Capable of carrying up to nine tons of cargo or 71 soldiers, the C-295 can operate from short, unpaved runways, making it ideal for deployment in mountainous areas, such as the border with China and the Andaman & Nicobar Islands. The aircraft also features Indian-made electronic warfare systems and a rear ramp for rapid troop and cargo deployment.

Akashteer project: Revolutionizing India's air defence

The Indian Army has deployed a new air defence system called Akashteer to modernize its defences. This project is part of the Army's "Decade of Transformation" and "Year of Tech Absorption" initiatives.

Akashteer automates and integrates India’s air defence network. It combines data from Army and Air Force sensors, creating a single, shared view of the airspace for all units. This shared view improves coordination and awareness.

The system has undergone real-world testing, simulating potential future conflicts. A senior military officer observed the testing and praised the project, saying it has “realised a transformative leap in the Indian Army's air defence capabilities.”

The system automates tasks previously done manually, significantly speeding up response times—critical for defending against fast-moving aircraft.

Akashteer allows frontline units to make quick decisions about engaging enemy aircraft while preventing friendly fire incidents. Units in the Northern and Eastern Commands are already using these systems.

The system combines data from various radars and weapon systems to create a comprehensive view of the airspace, aiding both planning and reactions to immediate threats.

Akashteer is built with backup communication systems to maintain connectivity in difficult situations. It can also be upgraded with new software and hardware as technology advances.

The system can be deployed on mobile platforms for some units and in fixed locations for others, depending on operational needs.

The phased induction of Akashteer is currently in progress. Of the 455 systems required, 107 were delivered by November 12, with 105 more scheduled for delivery by March 2025. The remaining units will be supplied by March 2027, ensuring extensive coverage across the Indian Army's defence formations.

New submarines, ships, and helicopters

India strengthened its military in 2024 with the addition of new submarines, ships, and helicopters.

The Indian Navy inducted INS Arighaat, a submarine, on August 29, 2024, in Visakhapatnam. This submarine incorporates advanced technology and Indian-made systems.

The Navy also commissioned INS Tushil, a guided-missile frigate, on December 9, 2024, in Kaliningrad, Russia. This ship is an upgraded Krivak III-class frigate.

The Navy also commissioned survey vessels INS Sandhayak and INS Nirdeshak in February and December, respectively. Additionally, the Navy inducted INS Surat, a destroyer, and continued work on seven stealth frigates.

The Navy also introduced Drishti-10 remotely piloted aircraft for surveillance and equipped ships with unmanned aerial systems. Nine MH-60R helicopters were put into service, with the first MH-60R squadron (INAS 334) commissioned in March. These helicopters participated in exercises like MALABAR, SIMBEX, and MILAN 24.

The Indian Air Force added Light Combat Helicopters (LCH) in February 2024. Personnel trained on these helicopters and deployed them during Exercise Gagan Shakti in April 2024.

Series of contracts

India has signed several defence contracts in recent months, enhancing its military capabilities across land, sea, and air. These agreements span various equipment, including aircraft, missiles, ships, and electronic warfare systems.

In October 2024, the ministry of defence (MoD) finalised a deal with the US government for 31 MQ-9B Sky/Sea Guardian drones. A related contract with General Atomics Global India will provide maintenance and repair services within India.

That same month, the Indian coast guard ordered six air-cushion vehicles (hovercraft) from Chowgule & Company Private Limited for Rs 387.44 crore.November 2024 saw a Rs 1,207.5

crore contract with Cochin Shipyard Limited for the refit and dry docking of the aircraft carrier INS Vikramaditya.

In December 2024, the MoD signed a contract with Hindustan Aeronautics Limited (HAL) for 12 Su-30MKI aircraft and associated equipment, costing approximately Rs 13,500 crore. Another contract with Larsen & Toubro Limited provided the Indian Army with 155 mm/52 caliber K9 VAJRA-T self-propelled artillery guns, valued at Rs 7,628.70 crore.

Global engagements

The ministry of defence significantly expanded its international defence cooperation in 2024 through high-level visits and military exercises. Defense minister Rajnath Singh spearheaded these efforts, visiting several key nations.Singh visited the United States in August, meeting with secretary of defence Lloyd Austin and national security advisor Jake Sullivan. Discussions included defence cooperation, industrial collaboration, and regional security.

In December, Singh traveled to Russia, co-chairing the India-Russia Inter-Governmental Commission on Military & Military Technical Cooperation. He also met with President Vladimir Putin.

In January, Singh visited the United Kingdom to meet defence minister Grant Shapps and then-Prime Minister Rishi Sunak, focusing on defence and industrial collaboration.

He also participated in the ASEAN Defence Ministers' Meeting-Plus (ADMM-Plus) in November, advocating for a "rule-based international order for peace & prosperity in Indo-Pacific." Singh held meetings with counterparts from China, the US, Malaysia, Laos, South Korea, Australia, New Zealand, and the Philippines.

In August, Singh and external affairs Minister S Jaishankar hosted the third India-Japan 2+2 ministerial dialogue in New Delhi with their Japanese counterparts, reviewing defence activities and discussing increased cooperation.

October brought the sixth India-Singapore defence ministerial dialogue to New Delhi, where Singh and Singapore's defence minister affirmed their commitment to regional peace and stability.Finally, in February, Singh met with Netherlands defence minister Kajsa Ollongren in New Delhi to explore expanded cooperation, particularly in maritime and industrial domains. Both ministers stressed enhanced naval interaction and the shared goal of ensuring Indian Ocean security.

Successful military exercises in India

This year, India successfully conducted numerous military exercises across various states. Here are some of the key ones:

Desert Cyclone

The joint military exercise "Desert Cyclone" between India and the UAE was conducted at the Mahajan Range in Bikaner, Rajasthan, from January 2 to January 15, 2024. The exercise involved troops from the Indian Army and the UAE's Zayed First Brigade. The training focused on joint tactical operations, culminating in validation training in Rajasthan.

The exercise aimed to improve cooperation and understanding between the two forces, particularly in peacekeeping operations. Training scenarios included fighting in built-up areas (FIBUA) in desert environments, relevant to UN peacekeeping mandates.

Specific drills included setting up joint surveillance centers, cordon and search operations, controlling built-up areas, and helicopter operations. The exercise provided a platform for sharing best practices and enhancing combat skills.

Exercise Milan

The Indian Navy's largest multilateral naval exercise, Milan 2024, began in Visakhapatnam on February 19, 2024. Ships from the Indian Navy and 16 foreign navies, along with a maritime patrol aircraft and delegations from various countries, participated.

The exercise was divided into two phases. The harbor phase (February 19–23) included events like an international city parade, a maritime seminar, a technology expo, and sporting events. The sea phase (February 24–27) involved complex drills such as air defence, anti-submarine, and anti-surface warfare exercises, along with gunnery shoots and maneuvers.

Milan 2024, held under the Eastern Naval Command, was the largest and most complex edition to date. The exercise's motto, 'Camaraderie Cohesion Collaboration,' reflects its focus on international maritime cooperation. It aimed to promote peace and prosperity in the region, aligning with "the Prime Minister's vision of Security & Growth for All in the Region (SAGAR)."

Exercise Tarkash

India and the US conducted their seventh annual joint counter-terrorism exercise, "Tarkash," from April 22 to May 15 in Kolkata. The three-week program involved the National Security Guard (NSG) and US special forces training together in urban counter-terrorism scenarios.

The exercise included mock drills in close-quarters battle, building entry, hostage rescue, surveillance, sniping, and complex multi-target operations.

An NSG spokesperson told the Times of India, "The primary objective of the Indo-US exercise 'Tarkash' is to build functional relations and enhance interoperability between their special forces in conducting coordinated counter-terror operations, particularly in urban counter-terrorism contingencies."

The exercise aimed to enhance cooperation between the two countries in combating all forms of terrorism.

Exercise Shakti

India and France launched their seventh joint military exercise, Shakti, on May 13, 2024, in Umroi, Meghalaya. The exercise, held at a modern training facility, concluded on May 26. French Ambassador to India Thierry Mathou and Major General Prasanna Sudhakar Joshi attended the opening ceremony.

Shakti is a biennial exercise, alternating between India and France. It aimed to enhance the ability of both nations to conduct multi-domain operations in sub-conventional scenarios as outlined in Chapter VII of the United Nations mandate.

The training focused on operations in mountainous and semi-urban terrain, with objectives including improving physical fitness, tactical drills, and sharing best practices. Drills included responses to terrorist territorial seizures, establishing joint command posts, securing landing sites, and using drones and counter-drone systems.

Tarang Shakti

The Indian Air Force (IAF) concluded its largest-ever multinational air exercise, Tarang Shakti, on September 12. The exercise involved 10 participating countries and 18 observer nations and was conducted in two phases.

The first phase, held in Sulur, Tamil Nadu (August 6–14), included participants from Germany, France, the UK, and Spain. The second phase, held in Jodhpur (August 29–September 12), involved other nations.

The exercise featured around 75–80 IAF aircraft, alongside 67 fighters and military aircraft from participating nations. The IAF said, "Tarang Shakti 24 was the first multinational exercise hosted by the organization, marking the first such event in nearly six decades."

12th Joint Military Training Exercise

The Indian Air Force (IAF) and the Republic of Singapore Air Force (RSAF) conducted their 12th Joint Military Training Exercise at Air Force Station Kalaikunda, West Bengal, starting October 21, 2024.

SIMBEX

The 31st annual maritime exercise SIMBEX between Singapore and India concluded on October 29, 2024. The exercise occurred in two phases: a harbor phase in Visakhapatnam and a sea phase in the Bay of Bengal.

The harbor phase (October 23–25) featured expert exchanges, ship visits, and pre-sail planning. The sea phase (October 28–29) included advanced warfare tactics like anti-air, anti-surface, and anti-submarine exercises.

SIMBEX aimed to enhance interoperability between the two navies.

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Indian Army Deploys Sherp ATVs for UN Peacekeeping in South Sudan Ensuring High-Mobility Operations

Source: Republic World, Dt. 13 Mar 2025,
URL: https://www.republicworld.com/defence/indian-armed-forces/indian-army-deploys-sherp-atvs-for-un-peacekeeping-in-south-sudan-ensuring-high-mobility-operations

The Indian Army is set to deploy Sherp All-Terrain Vehicles (ATVs) for peacekeeping operations under the United Nations Mission in South Sudan (UNMISS), enhancing mobility in one of the world's most challenging operational environments. The move reinforces India's commitment to

global peacekeeping efforts while showcasing the country's growing self-reliance in defence manufacturing.

Announcing the deployment on X (formerly Twitter), the Army stated, "The Indian Army is set to deploy the indigenously developed Sherp All-Terrain Vehicles (ATVs) for peacekeeping operations to the United Nations Mission in South Sudan, UNMISS, significantly enhancing mobility in extreme terrain."

Engineered for extreme adaptability and amphibious capabilities, Sherp ATVs are designed to navigate through swamps, flooded areas, rugged landscapes, and dense vegetation—terrain that has long posed significant challenges to peacekeeping forces in South Sudan.

"The Sherp ATVs are engineered for superior adaptability and unmatched amphibious capabilities, making them ideal for the challenging environments encountered in South Sudan. As a force-multiplying asset, the Sherp ATV will bolster rapid response capabilities, improve high-mobility logistics, and extend the operational reach of UN peacekeepers," the Army further stated.

Beyond its tactical advantages, the move highlights India's Atmanirbhar Bharat initiative, underscoring the country's ability to develop and deploy advanced defence technologies on a global stage.

"This deployment showcases India's commitment to Atmanirbhar Bharat and demonstrates the nation's growing defence capabilities on a global stage, reinforcing tactical mobility and India's contribution to international peace and security," the Army added.

Sherp ATVs: Built for Extreme Conditions

Manufactured in India in collaboration with Ukraine's Sherp company, these ATVs are built to traverse terrain where conventional vehicles falter. Their low ground pressure, massive inflatable tyres, and amphibious capabilities allow them to float on water, crawl over obstacles, and operate in conditions ranging from marshlands to deserts. With South Sudan's flood-prone landscape and vast unpaved regions, the Sherp ATVs will prove invaluable in ensuring uninterrupted mobility for Indian peacekeepers.

India has long been one of the largest contributors to UN peacekeeping missions, with over 2,400 troops currently deployed in South Sudan under UNMISS. The addition of these ATVs will streamline logistics, enable faster troop movement, and improve operational effectiveness in high-risk areas.

UNMISS: India's Role in Global Peacekeeping

The United Nations Mission in South Sudan (UNMISS) was established on 8 July 2011, following the country's independence from Sudan on 9 July 2011. Tasked with ensuring stability in a fragile post-conflict environment, UNMISS operates under the United Nations Security Council Resolution 1996 (2011).

Since December 2016, the mission has been led by Nicholas Haysom, a South African lawyer and diplomat. Haysom took over from David Shearer in January 2021. As of March 2021, UNMISS comprises 14,222 military personnel, 1,446 police officers, and 2,228 civilian workers, alongside a contingent of experts, staff officers, and volunteers.

India plays a crucial role in the mission, not just as a troop-contributing nation but also at a leadership level. The military deployment of UNMISS is currently commanded by Indian Lieutenant General Mohan Subramanian, further solidifying India's influence in global

peacekeeping operations. Headquartered in Juba, the capital of South Sudan, the mission remains a vital force in maintaining stability in the region.

With the deployment of Sherp ATVs, India’s contribution to UNMISS will become even more pronounced, equipping its troops with cutting-edge mobility solutions to navigate one of the most volatile and unpredictable terrains in modern peacekeeping. The move reflects India's growing stature as a defence innovator while reaffirming its commitment to global peace and security.

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China's Zhulong-1 nuclear battery promises decades of uninterrupted power. All you need to know

Source: The Week, Dt. 14 mar 2025,
URL: https://www.theweek.in/news/defence/2025/03/14/chinas-zhulong-1-nuclear-battery-promises-decades-of-uninterrupted-power-all-you-need-to-know.html

A Chinese company has come out with a claim that it has developed the prototype of a carbon-14 (C-14) nuclear battery, which reportedly can last for a century without being charged, and has wide-ranging applications, including in healthcare and space exploration.

The nuclear battery, named Zhulong-1 after the mythical Chinese dragon deity which is a symbol of eternal light and energy in China's ancient text Shan Hai Jing, can survive in extreme conditions and temperatures, including the deep ocean, Antarctica, and on the moon and Mars.

The battery can power permanent implants like brain-computer interfaces or cardiac pacemakers and support networks of trillions of sensors for the Internet of Things, Zhang Guanghui, technology leader of the battery project said.

Wuxi Beita Pharmatech Co., Ltd, developed the nuclear battery in collaboration with Northwest Normal University, according to news agency Xinhua.

Nuclear batteries differ fundamentally from conventional chemical batteries as they convert radioactive decay energy into electricity.

"The core innovation of Zhulong-1 lies in the use of C-14, a radioactive isotope with a half-life of 5,730 years, which is paired with a silicon-carbide semiconductor to generate power," Xinhua quoted Zhang as saying.

“Theoretically, the battery could last for thousands of years thanks to the long half-life of carbon-14 at 5,730 years," South China Morning Post quoted Zhang as saying.

A Zhulong-1-powered LED functioned for nearly four months, in a live demonstration.

The battery can operate steadily within a temperature range of minus 100 degrees Celsius to 200 degrees Celsius, with an energy density 10 times higher than commercial lithium-ion batteries, and a degradation rate of less than 5 per cent over a designed lifespan of 50 years, Cai Dinglong, head of the battery project, said.

While the company has only spoken about its civilian applications, the nuclear battery has significant potential for defense applications due to its ultra-long lifespan, high energy density, and

ability to operate in extreme environments. They can sure provide continuous, maintenance-free power to drones, and remote surveillance, and IoT networks and underwater and deep-sea monitoring systems.

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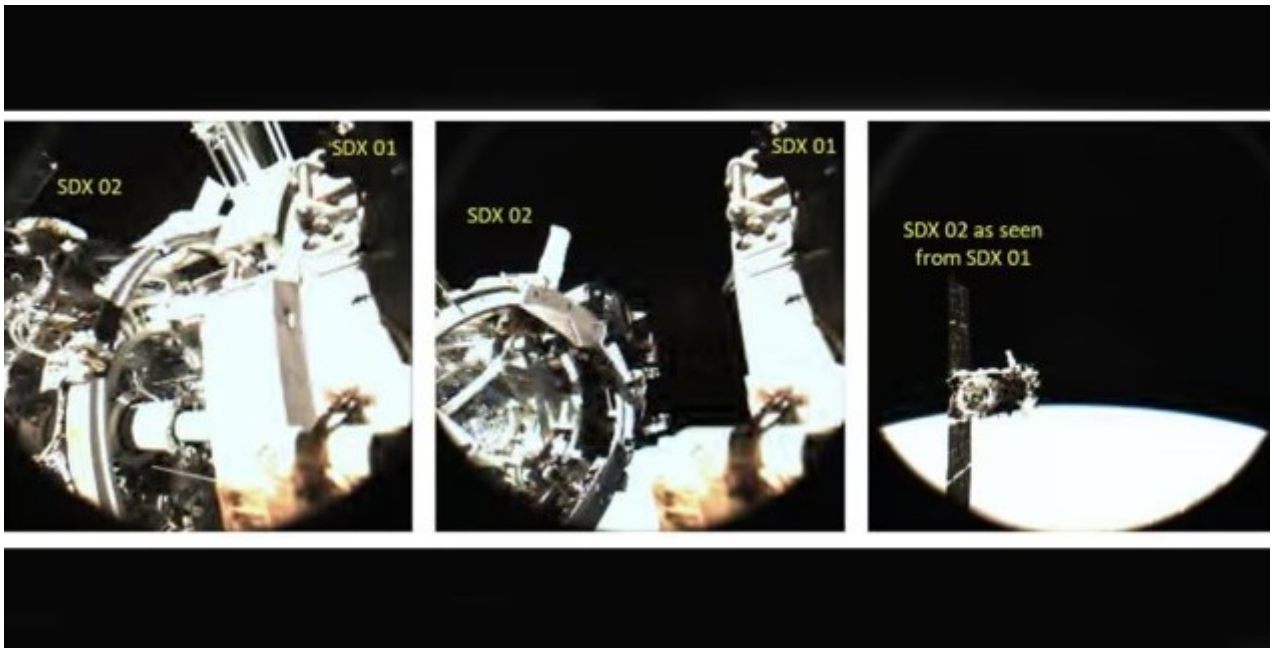
Science & Technology News

Isro undocks SpaDeX satellites 2 months after docking them in space

Source: The Indian Express, Dt. 14 Mar 2025,
URL: https://indianexpress.com/article/india/isro-undocks-spadex-satellites-2-months-after-docking-them-in-space-9884658/

Nearly two months after the Indian Space Research Organisation (ISRO) successfully demonstrated its docking capability, it disengaged and undocked the two satellites, SDX01 and SDX02, at 9.20 am Thursday.



On-board images of SpaDeX undocking. ISRO plans more docking, undocking experiments.

This capability is essential for future ISRO missions such as exploring the Moon, human spaceflight, and building its own space station.

The two satellites, SDX01 (Chaser) and SDX02 (Target), are now moving around independently in orbit.

For the undocking process, the SDX02 arm connecting the two satellites was extended, the capture levers released, and then the two satellites were given the command to separate.

With this manoeuvre, ISRO successfully demonstrated critical capabilities like rendezvous, docking and undocking, making India the fourth country after the United States, Russia and China to possess such capability.

Asked why the manoeuvre was carried out nearly two months after docking, ISRO officials said: "This is the first time we are attempting these capabilities, we did not want to go wrong at all. We were studying everything before carrying out the undocking manoeuvre." The space agency may carry out further docking and undocking experiments to improve precision.

In a statement, ISRO said: "Exhaustive ground simulations and analysis were the cornerstone of achieving the undocking in the first attempt itself. Various tests replicating in-orbit conditions were meticulously planned and carried out in preparation for the earliest opportunity for undocking operations." The window for carrying out the undocking manoeuvre was between March 10 and 25.

The Space Docking Experiment (SpaDeX) mission saw two small 220-kg satellites being brought together in the same orbit, then progressively brought near each other, before finally being joined early January 16. ISRO also demonstrated power sharing and the capability to give command to both the satellites as a single composite.

The capability is essential for several large, complex missions that ISRO has planned. For Chandrayaan-4, the next lunar mission which will bring back samples from the surface of the Moon, ISRO will need to carry out two dockings – one in the Moon orbit and one in the Earth orbit. After landing on the Moon and collecting the samples, the ascender module will fly back to the transfer module waiting in the lunar orbit. The transfer module will carry the samples back to the Earth orbit where it will meet the separately launched re-entry module capable of withstanding the heat of re-entry into the Earth's atmosphere.

The Bharatiya Antariksha Station, which the space agency plans to build by 2035, will comprise five modules that will be launched separately and joined in space to create the space station. The International Space Station also utilises the same mechanism to transport astronauts as well as supplies.

Importantly, ISRO developed its own Bharatiya Docking System for the experiment. It is on the lines of the International Docking System Standard used by spacecraft going to the International Space Station. The system is androgynous – the systems on both the Chaser and Target satellites are identical. However, instead of the 24 motors used in the International Docking System Standard, the ISRO system has two.

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Centre has approved Chandrayaan-5 mission: ISRO chief

Source: The Hindu, Dt. 17 Mar 2025,
URL: https://www.thehindu.com/sci-tech/science/centre-has-accorded-approval-for-chandrayaan-5-mission-isro-chief/article69337932.ece

The Centre has recently accorded approval for the ambitious Chandrayaan-5 mission to study the Moon, ISRO Chairman V Narayanan said on Sunday (March 16, 2025).

At an event to felicitate him for taking over as the Chairman of the Bengaluru-headquartered Indian Space Research Organisation, Narayanan said that unlike the Chandrayaan-3 mission which

carried the 25-kg rover 'Prayagyaan', the Chandrayaan-5 mission would carry a 250 kg rover to study the Moon's surface.

The Chandrayaan mission consists of studying the lunar surface. Chandrayaan-1, successfully launched in 2008, made chemical, mineralogical and photo-geologic maps of the Moon. The Chandrayaan-2 mission in 2019 concluded when its lunar landed crashed on the moon’s surface.

The high-resolution camera onboard the Chandrayaan-2 orbiter sent hundreds of images, Narayanan, also the Secretary of Department of Space, said.

The Chandrayaan-3 mission was a follow-on mission to Chandrayaan-2, to demonstrate end-to-end capability in safe landing and roving on the lunar surface. It was able to have the Vikram lander successfully soft-land on the moon’s south pole region on August 23, 2023.

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"Just three days back, we got the approval for Chandrayaan-5 mission. We will be doing it in association with Japan," Narayanan said.

The Chandrayaan-4 mission is expected to be launched in 2027. It will aim to collect samples of the lunar soil from the moon and bring the back to the earth for further study. On ISRO's future projects, Mr. Narayanan said apart from various missions including Gaganyaan, plans are afoot to establish India's own space station, called Bharatiya Antariksh Station.

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ISRO, SCL develops 32-bit Microprocessors for space applications

Source: The Economic Times, Dt. 16 Mar 2025,
URL: https://economictimes.indiatimes.com/news/science/isro-scl-develops-32-bit-microprocessors-for-space-applications/articleshow/119069553.cms

ISRO's Vikram Sarabhai Space Centre and Semiconductor Laboratory (SCL), Chandigarh have jointly developed 32-bit Microprocessors -- Vikram 3201 and Kalpana 3201-- for space

applications, the space agency has said. Vikram 3201 is the first fully Indian-made 32-bit microprocessor qualified for use in the harsh environmental conditions of launch vehicles. The processor was fabricated at the 180nm (nanometer) CMOS (Complementary Metal-Oxide-Semiconductor) semiconductor fab of SCL.

This processor is an advanced version of the indigenously designed 16-bit Vikram 1601 microprocessor, which has been operating in the avionics system of ISRO's launch vehicles since 2009, ISRO said in a statement released late on Saturday.

A "Make-in-India" version of the Vikram 1601 processor was subsequently inducted in 2016 after the 180nm semiconductor fab was established at SCL, the statement said. Kalpana 3201 is a 32-bit SPARC V8 (Scalable Processor ARChitecture, version 8) RISC (Reduced Instruction Set Computer) microprocessor and is based on the IEEE 1754 Instruction Set Architecture, the space agency said.

This microprocessor has been designed to be compatible with open-source software toolsets along with in-house developed simulators and IDE (Integrated Development Environment), and has been tested with flight software, it said. According to ISRO, Vikram 3201 and Vikram 1601 have a custom Instruction Set Architecture, with floating-point computation capability and high-level language support for the Ada language.

All the software tools such as the Ada compiler, assembler, linker, simulator along with Integrated Development Environment (IDE) are developed in-house by ISRO, it said, a C language compiler is also under development for providing more flexibility to users in other domains.

This is the first of its kind in India and has enabled 'Atmanirbharata' in the area of high-reliability microprocessors and onboard computers for navigation, guidance and control of launch vehicles, it said.

The initial lot of Vikram 3201 devices was successfully validated in space in the Mission Management Computer of the PSLV Orbital Experimental Module (POEM-4) in the PSLV-C60 mission, it added.

The first production lots of the 32-bit microprocessors -- Vikram 3201 and Kalpana 3201 -- were recently handed over to V Narayanan, Secretary, DOS /Chairman, ISRO by S Krishnan, Secretary, Ministry of Electronics and Information Technology (MeitY). Four other devices that were jointly developed with SCL were also handed over towards significant miniaturisation of the launch vehicle Avionics system.

This includes two versions of a Reconfigurable Data Acquisition System (RDAS) integrating multiple indigenously designed 24-bit Sigma-Delta Analog to Digital Converters on a single chip along with a Relay driver Integrated Circuit, and a Multi-Channel Low Drop-out Regulator Integrated Circuit for high-reliability applications, it said.

An MoU was also signed between SCL & Vikram Sarabhai Space Centre of ISRO for the development and delivery of miniaturized unsteady pressure sensors for measuring dynamic pressure in wind tunnels, the space agency added.

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ISRO conducts flight acceptance hot test of Cryogenic Engine for LVM3-M6 Mission

Source: The Economic Times, Dt. 15 Mar 2025,
URL: https://economictimes.indiatimes.com/news/science/isro-conducts-flight-acceptance-hot-test-of-cryogenic-engine-for-lvm3-m6-mission/articleshow/119033912.cms

ISRO on Saturday said it has successfully conducted the flight acceptance hot testing of the cryogenic engine identified for the sixth operational mission of LVM3 launch vehicle (LVM-M6) at ISRO Propulsion Complex, Mahendragiri in Tamil Nadu. The LVM3 (Launch Vehicle Mark-3) is a three-stage medium-lift launch vehicle developed by the Indian Space Research Organisation (ISRO).

The cryogenic engine of every mission undergoes hot testing as part of its acceptance process for the flight, ISRO said in a statement. Hot tests for the indigenous cryogenic engine (CE20) used in the Cryogenic Upper Stage of LVM3 were so far performed at the High-Altitude Test (HAT) facility at ISRO Propulsion Complex (IPRC) where vacuum conditions are simulated with complex installations, limiting the maximum hot test duration to 25 seconds.

"In the current test, the engine was tested for a longer duration of 100 seconds for the first time using an innovative Nozzle Protection System under non-vacuum conditions," ISRO said.

The space agency said that this test method significantly reduces the setup time and effort required for the flight acceptance test of a cryogenic engine, which in turn helps faster delivery of cryogenic stages for space missions.

"Performance of the CE20 engine met all the test objectives and the parameters were closely matching with the predictions during the entire duration of the test," ISRO said.

Further, this engine will be integrated into the Cryogenic Upper Stage of the launch vehicle for the LVM3-M6 mission, which is scheduled during the second half of 2025, the statement read.

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Scientists ‘freeze’ light, and it’s as cool as it sounds

Source: The Times of India, Dt. 15 Mar 2025,
URL: https://timesofindia.indiatimes.com/science/scientists-freeze-light-and-its-as-cool-as-it-sounds/articleshow/119042589.cms

Italian researchers have pulled off a sci-fi-worthy stunt—freezing light. No, they didn’t trap it in an ice cube, but they did get it to behave in a way never seen before. Their work, published in Nature, proves that light can exist in a bizarre state of matter known as a supersolid—something that’s both solid and fluid at the same time.

"This is just the beginning," said lead researcher Antonio Gianfante from CNR Nanotec, alongside Davide Nigro from the University of Pavia. And if their excitement is anything to go by, this could be a game-changer in quantum science.

So... how do you freeze light?

Normally, when you freeze something, you just crank down the temperature. But light doesn't play by those rules. Instead, the scientists used quantum trickery to get photons—the fundamental particles of light—to behave like supersolids.

Here's how they did it:

- They built a special semiconductor platform with microscopic ridges.
- They fired a laser into the structure, generating polariton particles (a hybrid of light and matter).
- When they packed enough photons into the system, they formed a strange, wave-like structure—the signature of a supersolid.

The result? Light behaving in a way never thought possible.

Why it matters—and why it's super cool

This breakthrough isn't just a neat science trick—it could revolutionize quantum computing. Supersolid light might lead to more stable qubits, the backbone of ultra-fast quantum computers. That means more powerful AI, better encryption, and possibly even a step closer to quantum internet.

But that's not all. This discovery could transform optical technology, helping scientists develop futuristic light-based circuits and new ways to manipulate energy.

For now, Gianfante and his team are busy refining their experiments, but one thing's certain—this discovery has lit the way for a mind-bending future.

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