

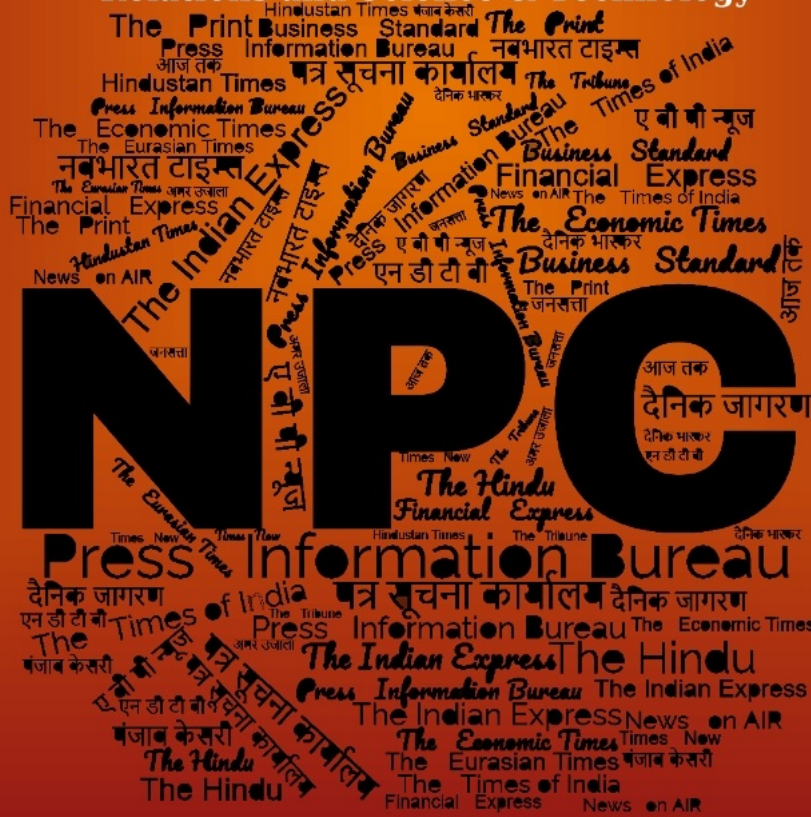
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DRDO News

DRDO displays Pralay Weapon System, Raksha Kavach during 76th R-Day parade

Source: ANI News, Dt. 26 Jan 2025,

URL: <https://www.aninews.in/news/national/general-news/drdo-displays-pralay-weapon-system-raksha-kavach-during-76th-r-day-parade20250126142114/>

Premier defence research agency Defence Research & Development Organisation (DRDO) displayed its select path-breaking innovations for national security during the 76th Republic Day celebrations at Kartavya Path here.

DRDO displayed the Raksha Kavach led by Sachin Kumar, Scientist 'E', from DEAL, Dehradun. The futuristic warfare technology Raksha Kavach is showcasing the defence preparedness to counter threats emerging from air, ground and water. The Sea King helicopter detects a submerged submarine and releases a torpedo to destroy it. This was followed by a multi-layered Air Defence System protecting ground and airspace from adversary threats like missiles, rockets, drones or ground assaults using state-of-the-art long-range surveillance achieved through EW satellite, AEW&CS and Rustom-II UAV.

This triggers soft kill through microwave jammers of anti- drone system and hard kill with QRSAM, ATAGS, VSHORADS and high-power lasers. Other weapons like ATAGS and UGRAM are used to engage with ground assaults. The next on display was the Pralay Weapon System, an indigenously developed by RCI, DRDO with State of the Art Avionics and Guidance Systems.



Pralay is a surface-to-surface tactical weapon with a range in excess of 400 KMs designed to neutralise a wide variety of targets in the battlefield with pinpoint accuracy. Pralay is capable of destruction of war-waging potential of adversary even before the commencement of contact battle owing to its flexible range and lethality with different types and class of warheads.

The Pralay weapon system is led by the Project Director Dr R Srinivasan, Scientist 'G' and seconded by Deputy Project Director D Ravikumar, Scientist 'E'.

Meanwhile, the tableau of the Indian Coast Guard led by Commandant (JG) Soniya Singh and Commandant (JG) Sadhana Singh, focuses on coastal security and maritime search and rescue, under the theme 'Swarnim Bharat: Heritage and Progress'.

At the forefront, it showcases a swift-response mission featuring an indigenously built interceptor boat, a drone, and an Advanced Light Helicopter (ALH). A stranded fisherman signals for help from a sunken boat, assured that the Indian Coast Guard is prepared to handle emergencies.

The tableau highlighted assets like drones dropping life buoys and coordinated operations symbolising life-saving efforts. The rear of the tableau depicted a dedicated Maritime Search and Rescue (M-SAR) coordination centre with a network of 84 radar stations along the coastline. Real-time distress signals are relayed to patrolling Coast Guard ships and aircraft. All the equipment and technology showcased are entirely indigenous.

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DRDO to showcase 'Made in T' rifle at Delhi R-Day parade

Source: The Times of India, Dt. 26 Jan 2025,

URL: <https://timesofindia.indiatimes.com/city/hyderabad/drdo-to-showcase-made-in-t-rifle-at-delhi-r-day-parade/articleshow/117562162.cms>

In a resounding boost for 'Made in Telangana', India's first 100% indigenously developed assault rifle, UGRAM, will be showcased by the Defence Research & Development Organisation (DRDO) as part of its 76th Republic Day parade tableau.

Hyderabad-based Dvipa Defence India Pvt Ltd, formerly known as Dvipa Armour Pvt Ltd, successfully developed and manufactured UGRAM in collaboration with DRDO's Pune-based Armament Research & Development Establishment (ARDE).

The first prototype of UGRAM was developed by Dvipa in less than 100 days, marking its maiden attempt at arms manufacturing.

The company has so far supplied 20 UGRAM rifles to ARDE for testing by different govt security and defence agencies.

DRDO's tableau, which is on the theme 'Raksha Kavach – Multilayer Protection against Multi-domain Threats' this year, will march down Rajpath flaunting cutting-edge Atmanirbhar defence technologies and path-breaking innovations.

Apart from UGRAM, the tableau will also feature a quick reaction surface-to-air missile, airborne early warning & control system, 155 mm/52 cal advanced towed artillery gun system, drone detect, deter & destroy system, satellite-based surveillance system, medium power radar Arudhra, advanced lightweight torpedo, electronic warfare system Dharashakti, laser-based directed energy weapon, very short range air defence system, indigenous unmanned aerial system, among others.

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Defence News

Defence Strategic: National/International

Republic Day 2025: India displays cutting-edge defence tech and military might

Source: The Economic Times, Dt. 26 Jan 2025,

URL: <https://economictimes.indiatimes.com/news/defence/republic-day-2025-india-displays-cutting-edge-defence-tech-and-military-might/articleshow/117583800.cms>

India showcased its military might and the capability of indigenous defence industry at the Republic Day parade on Sunday. A rare, clear January day made the parade special, with spectators able to easily view the much anticipated flypast too, which included a vertical Charlie manoeuvre by Rafale fighter jets.

The 90-minute ceremony, which commenced with the visit of Prime Minister Narendra Modi to the National War Memorial, showcased a variety of indigenous weapon systems, led by the Pralay surface-to-surface tactical ballistic missile, which made its debut at the event. Also part of the parade were the Pinaka Multi Barrel Rocket Launcher systems that are widely used by the army and have been exported as well.

A unique feature of the parade this year was the presence of the marching contingent of Indonesian National Armed Forces and Military Band of Indonesia's Military Academy. The marching contingent of 152 members, with 190 members in the military band, was in honour of the chief guest, Indonesian President Prabowo Subianto. The Indian Army contingent was led by the 61 Cavalry, followed by nine mechanised columns and nine marching contingents. Equipment featured by the army included T 90 tanks, the indigenous NAG missile system, Akash Weapon System and the Integrated Battlefield Surveillance System. For the first time, a tri-services tableau also rolled down on Kartavya Path, displaying the spirit of jointness and integration. It featured a joint operations room facilitating networking and communication among the three services.

DRDO also showcased innovations for national security during the parade, with the theme of 'Raksha Kavach-Multi-layer Protection against Multi-domain Threats'. This displayed a quick reaction surface-to-air missile, airborne early warning & control system and 155 mm/52 cal advanced towed artillery gun system. It also featured electronic warfare system and laser-based directed energy weapon under development.

The showstopper was the flypast towards the end of the show that was undertaken by 40 aircraft and helicopters. This included 22 fighter jets, 11 transport aircraft and seven helicopters.

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Raksha Mantri Shri Rajnath Singh flags-off 'SANJAY - The Battlefield Surveillance System' from New Delhi

Source: Press Information Bureau, Dt. 24 Jan 2025,

URL: <https://pib.gov.in/PressReleasePage.aspx?PRID=2095712>

Raksha Mantri Shri Rajnath Singh flagged-off 'SANJAY - The Battlefield Surveillance System (BSS)' from South Block, New Delhi on January 24, 2025. SANJAY is an automated system which integrates the inputs from all ground and aerial battlefield sensors, processing them to confirm their veracity, preventing duplication and fusing them to produce a Common Surveillance Picture of the battlefield over secured Army Data Network & Satellite Communication Network. It will enhance battlefield transparency and transform the future battlefield through a Centralised Web Application which will provide inputs to Command & Army Headquarters, and the Indian Army Decision Support System.



The BSS is equipped with state-of-the-art sensors and cutting-edge analytics. It will monitor the vast land borders, prevent intrusions, assess situations with unparalleled accuracy and prove to be a force multiplier in Intelligence, Surveillance & Reconnaissance. This would enable commanders to operate in both conventional & sub-conventional operations in a Network Centric Environment. Its induction will be an extraordinary leap towards data and network centricity in the Indian Army.

SANJAY has been indigenously & jointly developed by the Indian Army and Bharat Electronics Limited (BEL) creating a conducive ecosystem towards achieving 'Aatmanirbharta' as a follow up to the Indian Army's 'Year of Technology Absorption'. These systems will be inducted to all operational Brigades, Divisions & Corps of the Indian Army in three phases *w.e.f.* March to October of 2025, which has been declared as 'Year of Reforms' in the Ministry of Defence (MoD). This system has been developed under the Buy (Indian) category at a cost of Rs 2,402 crore.



Raksha Rajya Mantri Shri Sanjay Seth, Chief of Defence Staff General Anil Chauhan, Chief of the Army Staff General Upendra Dwivedi, Defence Secretary Shri Rajesh Kumar Singh, Secretary (Defence Production) Shri Sanjeev Kumar, Chairman & Managing Director, BEL Shri Manoj Jain and other senior officials of MoD & BEL were present on the during the flagging-off ceremony.

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India, Indonesia strengthen defence ties; BrahMos deal tops Modi-Subianto meeting

Source: The Economic Times, Dt. 27 Jan 2025,

URL: <https://economictimes.indiatimes.com/news/defence/india-indonesia-strengthen-defence-ties-brahmos-deal-tops-modi-subianto-meeting/articleshow/117583907.cms>

The export of BrahMos missiles (jointly developed by India and Russia) to Indonesia topped the agenda of PM Narendra Modi-President Prabowo Subianto summit here on Saturday.

Subianto, at the summit, recognised the importance of building domestic defence manufacturing capabilities and appreciated India's advancements, and expressed interest in strengthening cooperation in this sector.

India agreed to support the ongoing defence modernisation programmes of Indonesia through experience and expertise sharing. Both countries affirmed their commitment to deepen collaboration in the defence industry by utilising the Joint Defence Cooperation Committee (JDCC), according to the joint statement issued following the summit.

In this context, the CEO of BrahMoS Jaiteerth R Joshi met Subianto in the presence of Modi. Later, a high-level delegation headed by Chief of Staff, Adm Muhammad Ali of the Indonesian

Navy visited BrahMos facility and engaged with Joshi. The delegation was apprised of the supersonic weapon system. During their interaction, the two sides exchanged ideas and insights on further strengthening bilateral cooperation in the area of defence and strategy. Subianto has been keen to purchase BrahMos since his days of being the defence minister. India may extend a Line of Credit to Jakarta for sale of BrahMos missiles.

Both leaders also sent an indirect but a strong message to Pakistan when they emphasised the need for all countries to work collectively to deny safe havens and support networks to terrorist groups, in accordance with international obligations and commitments.

Both leaders strongly condemned terrorism in all its forms and manifestations and reaffirmed their commitment to enhancing cooperation in combating this threat through bilateral and multilateral initiatives.

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India, Indonesia boost defence cooperation with DCA ratification, cadet exchanges between Naval Academies

Source: The Economic Times, Dt. 26 Jan 2025,

URL: <https://economictimes.indiatimes.com/news/defence/india-indonesia-boost-defence-cooperation-with-dca-ratification-cadet-exchanges-between-naval-academies/articleshow/117577718.cms>

India and Indonesia have taken a significant step forward in their strategic partnership, strengthening defence and maritime cooperation through key agreements and initiatives. The two nations reaffirmed their commitment to deepening ties with the ratification of the Defence Cooperation Agreement (DCA) and agreed to enhance collaboration through cadet exchanges between their Naval Academies.

Additionally, both countries emphasised the importance of the Joint Defence Cooperation Committee (JDCC) in driving defence modernization and shared expertise.

Notably, at the invitation of the Prime Minister Narendra Modi, President of Indonesia, Prabowo Subianto paid a State Visit to India from January 23-26. He also attended the celebrations of the 76th Republic Day of India as the Chief Guest. He was accompanied by a high-level delegation including several Ministers as well as Senior Officials of the Indonesian government and a business delegation, the Ministry of External Affairs said in a press release.

The two leaders expressed satisfaction at the strategic and operational interaction between the defence forces of both countries, comprising more than two decades long continuous biannual India-Indonesia Coordinated Patrol, conduct of periodic bilateral Army (Ex Garuda Shakti) and Naval (Ex Samudra Shakti) exercises, and regular participation in each other's multilateral exercises- Milan, Komodo, Tarang Shakti and Super Garuda Shield.

Both leaders welcomed the interest to have cadet exchanges between the Naval Academies and the National Defence University/ Academy.

Recognizing the importance of building domestic defence manufacturing capabilities, President Prabowo appreciated India's advancements and expressed interest in strengthening cooperation in this sector. India agreed to support the ongoing defence modernization programmes of Indonesia through experience and expertise sharing. Both countries affirmed their commitment to deepen collaboration in the defence industry by utilizing the Joint Defence Cooperation Committee (JDCC), the release said.

President Prabowo welcomed India's interest in enhancing cooperation on maritime security, including its engagement with regional mechanisms to ensure the safety and security of sea lanes of communication. Both leaders also acknowledged the significance of collaborative efforts to achieve safe and secure sea lanes in the region. In this regard, they agreed that there needs to be constant communication to discuss enhancement of maritime safety.

Both leaders welcomed the ongoing discussions on the White Shipping Information Exchange (WSIE) agreement. They agreed to position an International Liaison Officer (ILO) from Indonesia at Information Fusion Centre-Indian Ocean region (IFC-IOR) Gurugram. They agreed to continue discussions to identify mutually beneficial areas of cooperation in maritime security.

The two leaders shared mutual appreciation for having co-chaired HADR related activities at ADMM+ and maritime security events at ASEAN Regional Forum (ARF) in the previous cycle. Both leaders agreed to continue their combined efforts for the safety of Navigation in the Straits of Malacca and Singapore (SOMS) through existing mechanisms to enable unhindered economic growth of the region. The leaders also agreed to commence cooperation in Hydrography and Submarine Search and Rescue while looking forward to the next edition of Exercise Samudra Shakti, the release said.

Both leaders welcomed the renewal of the MoU on Maritime Safety and Security Cooperation which signifies commitment to continue cooperating in preventing and responding to acts of crime at sea, coordinating search and rescue operation upon request, and capacity building activities.

The MEA release further said that both leaders strongly condemned terrorism in all its forms and manifestations and reaffirmed their commitment to enhancing cooperation in combating this threat through bilateral and multilateral initiatives. They underscored the importance of strengthening global efforts to combat terrorism, including eliminating terror financing and preventing the recruitment of terrorists, without any double standards. Both leaders emphasized the need for all countries to work collectively to deny safe havens and support networks to terrorist groups, in accordance with international obligations and commitments.

Both leaders called upon all countries to take concerted action against UN-proscribed terrorist organizations and their affiliates. Recognizing the evolving nature of security challenges, the two leaders agreed to work together in preventing the spread of online radicalization and strengthening mechanisms to counter extremist ideologies. Both leaders welcomed the 6th Joint Working Group Meeting on Counter-Terrorism, held in Jakarta on 23 August 2024, as a crucial platform for strengthening bilateral cooperation. They also look forward to the renewal of the MoU on Counter-Terrorism Cooperation. President Prabowo thanked PM Modi for offering specialized courses by the National Security Guard (NSG) of India, underscoring the value of capacity-building and knowledge-sharing in counter-terrorism efforts.

Notably, President Prabowo was accorded a ceremonial reception at the Rashtrapati Bhavan and he paid tributes to Mahatma Gandhi at Raj Ghat. This was followed by bilateral talks between Prime Minister Modi and President Prabowo. Thereafter, the two leaders witnessed the exchange of bilateral documents. President Prabowo attended the luncheon hosted by Prime Minister Modi in his honour. President Prabowo met President Droupadi Murmu. President Murmu also hosted a banquet dinner in his honour. Vice President Jagdeep Dhankhar and External Affairs Minister S Jaishankar also called on President Prabowo.

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India, Indonesia call for code of conduct in South China Sea

Source: The Hindu, Dt. 27 Jan 2025,

URL: <https://www.thehindu.com/news/national/india-indonesia-call-for-code-of-conduct-in-south-china-sea/article69145436.ece>

India and Indonesia have pitched for a "full and effective" code of conduct in the South China Sea in accordance with the relevant international laws amid China's increasing military muscle-flexing in the region. The situation in the South China Sea figured in wide-ranging talks between Prime Minister Narendra Modi and Indonesian President Prabowo Subianto on Saturday (January 25, 2025), according to a joint statement.

Indonesian President Subianto highlights Indian influence on Indonesian language, genetics In their meeting, the two sides agreed to position a liaison officer from Indonesia at India's Information Fusion Centre-Indian Ocean Region (IFC-IOR).

The Indian Navy established the IFC-IOR in Gurugram in 2018 to keep track of shipping traffic as well as other critical developments in the region under a collaborative framework with like-minded countries. Mr. Modi and Mr. Subianto, while strongly condemning terrorism in all its forms, vowed to enhance India-Indonesia anti-terror cooperation and called for concerted global efforts to combat the menace without any "double standards".

Both the leaders called upon all countries to take concerted action against UN-proscribed terrorist organisations and their affiliates, the statement released on Sunday (January 26, 2025) said. The Indonesian president arrived here on Thursday (January 23, 2025) on a four-day visit.

Southern flavour to President's reception for Republic Day Mr. Subianto was the chief guest at the Republic Day celebrations at the majestic Kartavya Path on Sunday (January 26, 2025).

In their talks, the Prime Minister and the visiting leader also explored ways to boost India-Indonesia economic ties and emphasised the importance of expeditious implementation of an MoU inked by the two sides last year for the use of local currencies for bilateral transactions, according to the statement. Mr. Modi and Mr. Subianto were of the view that the use of local currencies for bilateral transactions would further promote trade and deepen financial integration between the two economies.

The joint statement, referring to the situation in the maritime domain, said the two leaders reaffirmed the importance of maintaining and promoting peace, stability, freedom of navigation

and overflight in the region. They also called for unimpeded lawful maritime commerce and promoting peaceful resolution of disputes in accordance with universally recognised principles of international law, including the 1982 UNCLOS (UN Convention on the Law of the Sea).

Delhi sees warmest Republic Day in eight years with maximum temperature of 23.7° C" In this regard, they supported the full and effective implementation of the declaration on the conduct of the parties in the South China Sea (DOC) in its entirety and look forward to the early conclusion of an effective and substantive code of conduct in the South China Sea (COC) that is in accordance with international law, including the 1982 UNCLOS," the statement noted.

The ASEAN countries too have been insisting on a binding code of conduct (COC) on the South China Sea largely in view of China's consistent attempts to assert its expansive claims over the region. Beijing has been strongly opposing the COC. China claims sovereignty over all of the South China Sea, a huge source of hydrocarbons. However, several ASEAN member countries, including Vietnam, the Philippines and Brunei, have counterclaims.

In a ruling in 2016, the Permanent Court of Arbitration at the Hague dismissed Beijing's claim to much of the South China Sea. China, however, rejected the verdict. India has been pitching for a rules-based order in the region including through upholding adherence to international law, especially the UNCLOS.

Tricolour unfurled for first time in 35 years at Tral in J&K In their talks, Mr. Modi and Mr. Subianto also agreed to an early establishment of bilateral maritime dialogue and cyber security dialogue. The two leaders reaffirmed that India and Indonesia as maritime neighbours and strategic partners must continue to work to further deepen and broaden the defence cooperation to a robust one, the statement noted.

"Both leaders welcomed the ratification of the agreement concerning cooperation in the field of defence (DCA) and expressed confidence that this would lead to further deepening of defence ties," it said. The two leaders also agreed to commence bilateral cooperation in hydrography and submarine search and rescue.

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Two Kirti Chakras, 14 Shaurya Chakras among 93 Gallantry Awards to Armed Forces, CAPF personnel

Source: The Hindu, Dt. 25 Jan 2025,

URL: <https://www.thehindu.com/news/national/kirti-chakras-shaurya-chakras-among-93-gallantry-awards-to-armed-forces-capf-personnel/article69140967.ece>

The President of India and Supreme Commander of the Armed Forces Droupadi Murmu has approved two Kirti Chakras, one of them posthumous, and 14 Shaurya Chakras, three of them posthumous, in a total of 93 Gallantry Awards to personnel of the Armed Forces and Central Armed Police Forces (CAPF), 11 of which are posthumous, on the eve of 76th Republic Day.

The President of India and Supreme Commander of the Armed Forces Droupadi Murmu has approved two Kirti Chakras, one of them posthumous, and 14 Shaurya Chakras, three of them

posthumous, in a total of 93 Gallantry Awards to personnel of the Armed Forces and Central Armed Police Forces (CAPF), 11 of which are posthumous, on the eve of 76th Republic Day.

The 93 Gallantry Awards also include 67 Sena Medals, with seven of them awarded posthumously, two Nao Sena Medals, and eight Vayu Sena Medals.

Major Manjit Kumar of the Punjab Regiment and with 22 Rashtriya Rifles (RR), and Naik Dilwar Khan from the Artillery Regiment and with 28 RR (posthumously) were awarded the Kirti Chakra for counter-terrorist operations in Jammu and Kashmir.

Republic Day 2025: 942 personnel awarded gallantry and service medals

The President has also approved 305 defence decorations to the Armed Forces and other personnel. These include 30 Param Vishisht Seva Medals; five Uttam Yudh Seva Medals; 57 Ati Vishisht Seva Medals; 10 Yudh Seva Medals; 44 Sena Medals (Devotion to Duty); eight Nao Sena Medals (Devotion to Duty); 15 Vayu Sena Medals (Devotion to Duty); and 136 Vishisht Seva Medals. President Murmu also approved 58 Mentioned-in-Despatches to Armed Forces personnel, including four awarded posthumously. These include 55 from the Indian Army — 14 for Operation Rakshak, including four posthumous awards; eight for Operation Snow Leopard; six for Operation Hifazat; two for Operation Sahayta; one for Operation Rhino; one for Operation Meghdoot; two for Operation Gurihajan; one for Operation Mulkhyama; one for Operation Reconnaissance; one for Operation Zokhawthar; one for Operation Falcon; four for Operation CAS Evacuation; one for IS Duty; and 12 for miscellaneous operations. The 58 Mentioned-in-Despatches include three to Indian Air Force personnel for Operation Sankalp.

In addition, the President also approved the President's Tatrakshak Medal and Tatrakshak Medal to eight Coast Guard personnel.

The citation of Major Manjit details that on April 25, 2024, he assiduously trailed the movement of two foreign terrorists in a village in Sopore district through responsive human intelligence as received from a credible source. On localising the probable target complex, the officer established the initial cordon, during which terrorists retaliated and made several attempts to break the cordon throughout the intervening night. On April 26, 2024 at 5.30 a.m., one of the terrorists entered the adjoining orchard favouring natural cover. The officer pinned down the terrorist, and evacuated a trapped civilian and two children. Major Manjit started crawling towards the terrorist and on noticing the movement of the terrorist who was trying to lob a grenade at the scout, the Major engaged him in a fierce firefight and eliminated him, the citation states, adding, "For displaying conspicuous gallantry and exhibiting outstanding leadership Major Manjit is recommended for the award of Kirti Chakra."

The other citation of Kirti Chakra, for Naik Dilwar Khan, states that he was part of an ambush in the dense jungles of Lolab Valley, Kupwara district on July 23, 2024. At 11.50 p.m., his party observed two terrorists, one at a very close distance. "Sensing grave threat from the closing-in terrorist to his team, showing complete disregard to personal safety, Naik Dilwar Khan, though under a heavy volume of fire, lunged and grasped the terrorist, engaging him in hand-to-hand combat, while the other terrorist continued to fire indiscriminately from distance," the citation states. During this action, Naik Khan was grievously injured but did not let go of the terrorist and

killed him, firing at point-blank range before succumbing to his wounds. For displaying indomitable courage, utter disregard for personal safety and gallantry of the highest order, Naik Dilwar Khan is recommended for award of Kirti Chakra (Posthumous), the citation said.

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India-Bangladesh Row: Pakistani Military Officials Visit Border Region Near North-East; Threaten India’s “Chicken Neck”

Source: The EurAsian Times, Dt. 27 Jan 2025,

URL: <https://www.eurasiantimes.com/india-bangladesh-row-pakistani-military-officials/>

North Korea said Sunday (January 26, 2025) it tested a cruise missile system, its third known weapons display this year, and vowed “the toughest” response to what it called the escalation of U.S.-South Korean military drills that target the North.

A little over 50 years ago, Flight Lieutenant Matiur Rehman, a Bengali-speaking officer in the Pakistan Air Force (PAF), laid down his life during the 1971 Bangladesh Liberation War. For that, he was awarded Bangladesh’s highest gallantry award ‘Bir Shreshto.’

Now, five decades later, Bangladesh is overcoming the distances – both physical and emotional – with its former tormentor, Pakistan. India, which played an instrumental role in Bangladesh’s quest for freedom in the 1971 war, has all the reasons to worry. From discussing the sale of Chinese-Pakistan-built fighter jets to Dhaka to sharing intelligence, the two countries are experiencing a historic thawing in their relationship.

Bangladesh Air Force pilots are being seen in the cockpit of the Chinese-Pakistan jointly developed fighter JF-17. In February 2025, Pakistan Army officials will train the Bangladesh Army, and Dhaka will participate in the “Aman 2025” joint naval exercises in Karachi in the Arabian Sea.

In a potential red flag for the security of India’s northeastern states, the top Pakistan spy is in Bangladesh, and a potential intelligence-sharing network is expected between the two countries. For the first time in several decades, the head of Pakistan’s intelligence agency, the Inter-Services Intelligence (ISI), visited Bangladesh. ISI chief Lt Gen Asim Malik arrived in Dhaka via Dubai, where he was received by Lt Gen Muhammad Faizur Rahman, Quarter Master General (QMG) of the Bangladesh Army. Lt. Gen Rahman is known for his leanings towards Islamists.

The ISI Chief arrived in Dhaka on January 21. While the news outlets in Bangladesh remain tight-lipped about the visit’s agenda, there have been murmurs about an intelligence network being established between the two countries. This does not augur well for the peace and security of the northeastern states of India. The Pakistani officials were in Bangladesh’s Rangpur district, which is close to India’s ‘Chicken Neck.’ The ‘Chicken’s Neck’ is the narrow land corridor that connects India’s northeast with the rest of the country. Rangpur district is just 130 kilometers from Siliguri,

an important Indian military hub. Later, the Pakistani officials were expected to be taken to sensitive Chittagong Hill Tracts in a Bangladesh Army helicopter.

“The rapid Bangladeshi and Pakistani army officers’ visits at this time is rather surprising. It indicates a hurried move to achieve a military-security objective within a short period of time. However, there is no knowing what the Indian response to these back-to-back meetings and their likely objectives on the ground (in Bangladesh) will have in the coming weeks and months,” a retired Bangladeshi general, requesting anonymity, was quoted by NorthEast News.

Indian policymakers believe that Pakistan’s Inter-Service Intelligence (ISI) had used Bangladesh’s territory to train Islamic extremists to fight its proxy war against India in the region.

Former prime minister Sheikh Hasina, who had to flee the country following the ‘Monsoon Revolution’ in August 2024, has been instrumental in helping India curb extremism in the North East. India and Bangladesh took giant strides in three areas- transferring wanted criminals and counterterrorism, disrupting arms supply, and land border management.

Between the years 2009 and 2015, Bangladesh handed over more than half a dozen senior leaders of the United Liberation Front of Asom (ULFA), including the group’s general secretary, Anup Chetia; its chairman, Arabinda Rajkhowa; foreign secretary Sashadhar Choudhury; finance secretary Chitraban Hazarika; and deputy chief of military operations Raju Barua.

In 2023, when the peace accord was signed between the Leaders of the insurgent group ULFA and the Indian government, the rebel leaders accepted that the crackdown against the Indian insurgent groups by the “pro-India” Awami League government in Bangladesh pushed them towards no option but to join the peace talks with the government in 2011. According to the South Asia Terrorism Portal, the ULFA rebels had established links with Pakistan’s ISI and the Afghan Mujahideen. At least 200 ULFA activists are said to have received training in Pakistan and Afghanistan.

Seized documents and interrogation of some arrested activists revealed that the Defense Forces Intelligence (DFI) of Bangladesh had also trained ULFA cadres in the Sylhet district. ISI has also helped ULFA leaders, including Paresh Barua, to procure multiple passports. Several ULFA cadres have also reportedly received arms training from the ISI at various training centers in Pakistan, near the Afghanistan border. The training included courses in the use of rocket launchers, explosives, and assault weapons.

The top ULFA leadership, with the help of the Pakistani High Commission in Bangladesh, would travel to Karachi, from where they would be taken to the terrorist training centers run by the ISI. ULFA had also announced its support for Pakistan during the Kargil war against India. Paresh Baruah had been regularly visiting Karachi since 1992-93.

Now, the situation in Bangladesh could raise the bargaining power for the Paresh Baruah-led ULFA faction, which is against talks and is holding out from the jungles along the India-Myanmar border. There are some reports that he might be operating from China.

A high court bench in Bangladesh has already reduced the death sentence of Paresh Barua to life in the 2004 Chittagong arms-haul case. It was one of the largest weapons seizures in India's neighborhood, and it took place in the port city of Chittagong.

The consignment of 10 truckloads of illegal arms and ammunition included 4,930 firearms, 27,020 grenades, 840 rocket launchers, 300 rockets, 2,000 grenade launching tubes, 6,392 magazines, and over 1.1 million bullets. The weapons were believed to have been smuggled from China to be delivered to insurgent groups in India's northeastern states.

Insurgency in Manipur may also witness a spike. The elimination of safe havens in Myanmar's civil war-torn country was one of the reasons the Meitei-dominated United National Liberation Front (UNLF) signed a ceasefire deal with the government and surrendered in hundreds in November 2023. The UNLF's anti-talks section and other unhappy members may now find a new home in Bangladesh.

Hasina's Ouster Could Be Disastrous For India

Muhammad Yunus, the Chief Advisor to Bangladesh's interim government, has been giving India a cold shoulder. While he met Pakistan's Prime Minister Shehbaz Sharif three times in four months, he is yet to meet Indian Prime Minister Narendra Modi. Since 2018, there have been no direct flights between Pakistan and Bangladesh, separated by 1500 kilometers of Indian territory. For years, Pakistanis could not get visas for Bangladesh except in rare cases, as stringent security clearance requirements from different state agencies made travel practically impossible.

Bangladesh's interim government has eased visa requirements, and Pakistan has reciprocated by removing visa fees and security clearances for Bangladeshi travelers. In the meantime, the two countries are working towards restarting the flights.

The first direct cargo ship from Pakistan docked at Bangladesh's Chittagong port in November 2024. The establishment of the direct maritime link between the two countries was preceded by Bangladesh easing import restrictions on Pakistani goods in September. Earlier, goods from Pakistan required a mandatory 100 percent physical inspection on arrival.

Bangladesh: A Window To India's North East

Apart from security, the connectivity to India's northeast will likely suffer because of the New Delhi-Dhaka estrangement. Under Sheikh Hasina's government, the two countries worked towards increasing connectivity between India's northeast region and Bangladesh. And all can come to naught considering the growing distance between the two countries.

North Eastern states of India consist of a group of eight landlocked states (Assam, Arunachal Pradesh, Mizoram, Nagaland, Meghalaya, Tripura, Manipur, and Sikkim), of which Tripura, Meghalaya, Mizoram and Assam share borders with Bangladesh. These states are connected to mainland India through the 22-kilometre-wide Siliguri Corridor (popularly known as the Chicken's Neck). India's cooperation with Bangladesh was not only in the sphere of security but also brought economic windfall to the North Eastern states.

Bangladesh's decision to grant transit to India and the decision to set up border markets and establish road and rail connectivity with Northeast India have economically (and demographically) connected the region to mainland India.

In 2023, the two countries launched the projects for the Akhaura-Agartala cross-border rail link, the Khulna-Mongla port rail line, and unit II of the Maitree super thermal power plant. The Akhaura-Agartala cross-border rail link connected India's northeast to Bangladesh by rail for the first time. Connected to Bangladesh's Chittagong port, the link has been planned to boost tourism and trade in the North-Eastern region of India.

The 64.7-km Khulna-Mongla port railway line connects Bangladesh's second-largest port to the country's rail network for the first time. It is also connected to India via the Petrapole cross-border rail link. This connectivity served as a lifeline during the COVID-19 pandemic, when more than 4,000 tonnes of liquid medical oxygen was transported to Bangladesh.

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“Woefully Short” On AEW&C: China, Pakistan Lead India In “Eye In The Sky”, How Can IAF Push Forward?

Source: The EurAsian Times, Dt. 26 Jan 2025,

URL: <https://www.eurasiantimes.com/woefully-short-on-aewc-as-pakistan-china-lead-india-in-eye-in-the-sky-how-can-iaf-push-forward-rule-the-skies/>

AEW&C units are also used to carry out aerial surveillance over ground and maritime targets and frequently perform battle management command and control (BMC2). Compared to ground-based radars, the altitude allows much deeper surveillance of adversary territory. The aircraft mobility and extended sensor range combine to increase the total coverage area and reduce the platform's vulnerability to counter-attacks.

AEW&C aircraft are used for both defensive and offensive air operations. Major navies, such as the United States Navy, have aircraft carrier-based AEW&C, such as the Northrop Grumman E-2 Hawkeye, which is assigned to its super-carriers. AWACS (Airborne Warning and Control System) is the name of the specific system installed in the E-3 and Japanese Boeing E-767 AEW&C airframes, but it is often used as a general synonym for AEW&C. Clearly, the AEW&C is a very important combat support system and force multiplier.

Modern AEW&C

Modern AEW&C systems can detect aircraft from up to 400 km away, well out of range of most surface-to-air missiles. A typical AEW&C aircraft flying at 9,000 m (30,000 ft) can cover an area of 312,000 sq.km. Three such aircraft in overlapping orbits can cover the whole of Central Europe or most of the relevant parts of the Himalayas.

AEW&C system can transfer data directly to the ground or other platforms to help them improve their situational awareness. They will indicate close and far proximity ranges on threats and targets. They can also help extend the range of fighting platforms and their sensors and make offensive aircraft harder to track by reducing the need for them to keep their own radar active,

which the enemy can detect. These systems also communicate with friendly aircraft, vectoring fighters toward hostile aircraft or any unidentified flying object.

AEW&C normally flies a race-course pattern to ideally cover the areas of tactical interest. The flight pattern can be changed based on the tactical situation. Some AEW&C can be refueled in the air. Sometimes, fighter escorts support AEW&C for their air defense. There are proposals for future AEW&C that could be of a flying-wing design and have some level of stealth capabilities. All AEW&C have Electronic Countermeasures (ECM) and other countermeasures. Future platforms may have self-defense aerial missiles or even directed energy weapons.

The AEW&C are threatened by what are often called the “AWACS killer missiles” with long ranges. China’s PL-17 or PL-20 have claimed a range of more than 400 km and are intended to target high-value airborne assets (HVAA) such as tankers and early warning and control (AEW&C) aircraft. Nowadays, countries have also started developing hypersonic air-to-air missiles using scramjet engines (such as R-37 or AIM-260 JATM), which not only increases efficiency for BVR battles but also greatly reduces the survival chances of target aircraft.

Current AEW&C Systems

Many countries have developed their own AEW&C systems, although the Boeing E-3 Sentry, E-7A, Northrop Grumman E-2 Hawkeye, and Gulfstream/IAI EL/W-2085 are the most common systems worldwide. Boeing produces a specific system with a “rotodome” (rotating radome) that incorporates Westinghouse (now Northrop Grumman) radar.

It is mounted on either the E-3 Sentry aircraft (Boeing 707) or, more recently, the Boeing E-767 (Boeing 767), the latter only being used by the Japan Air Self-Defense Force. The Russian Aerospace Forces are currently using Beriev A-50 and A-50U “Shmel” in the AEW role. The “Mainstay” is based on the Ilyushin Il-76 airframe, with a large non-rotating disk radome on the rear fuselage. The A-50 and A-50U will eventually be replaced by the Beriev A-100, which features an AESA array in the radome and is based on the updated Il-476.

The EL/W-2085 is an airborne early warning and control (AEW&C) multi-band radar system developed by Israel Aerospace Industries (IAI) and its subsidiary Elta Systems of Israel. Its primary objective is to provide intelligence to maintain air superiority and conduct surveillance.

The system is currently in service with Israel, Italy, and Singapore. Instead of using a rotodome, a moving beam radar was found on some AEW&C aircraft, and the EL/W-2085 uses an active electronically scanned array (AESA) – an active phased array radar. This radar consists of an array of transmit/receive (T/R) modules that allow a beam to be electronically steered, making a physically rotating rotodome unnecessary. ELTA was the first company to introduce an Active Electronically Scanned Array Airborne (AESA) Early Warning Aircraft and implement advanced mission aircraft using efficient, high-performance business jet platforms.

The Royal Australian Air Force, the Republic of Korea Air Force, and the Turkish Air Force are deploying Boeing 737 AEW&C aircraft. The Swedish Air Force uses the S 100D Argus ASC890 as its AEW platform. The S 100D Argus is based on the Saab 340 with an Ericsson Erieye PS-890 radar. Saab also offers the Bombardier Global 6000-based GlobalEye. The Hellenic Air Force,

Brazilian Air Force, and Mexican Air Force use the Embraer R-99 with an Ericsson Erieye PS-890 radar, as on the S 100D.

Israel has developed the IAI/Elta EL/M-2075 Phalcon system, which uses an AESA in lieu of a rotodome antenna. The system was the first such system to enter service. The original Phalcon was mounted on a Boeing 707 and developed for the Israeli Defence Forces and export. Israel uses IAI EL/W-2085 airborne early warning and control multi-band radar system on Gulfstream G550; this platform is considered to be both more capable and less expensive to operate than the older Boeing 707-based Phalcon fleet.

AEW&C With India's Neighbours

China has four KJ-2000 (IL-76 based), 11 Shaanxi KJ-200 (Y-8 based), and 34 Shaanxi KJ-500 (Y-9 based). China's Y-20 aircraft-based KJ-3000 is under testing and will soon be inducted with much greater range, endurance, and perhaps detection capability. China is also developing a carrier-based AEW&C, Xian KJ-600 (aboard Y-7) derived Xian JZY-01 test-bed.

Pakistan has been operating the Saab 2000 using the Erieye radar as its primary AEW&C platform since 2009. They have six of these. They also have four ZDK-03, a Chinese AESA radar mounted on a Y-8F-600 airframe (Antonov An-12), designated the "Karakoram Eagle".

Indian AEW&C

The Indian Air Force (IAF) has been operating three Israeli EL/W-2090 Phalcon radar mounted on Russian-origin Ilyushin-76 transport aircraft since May 2009. Also, India has had three DRDO 'Netra' (Embraer 145 ERJ-based) since the beginning of February 2017. India's Defence Acquisition Council (DAC) has cleared six more DRDO AEW&C designated Netra-1A in October 2024.

Since the 145 ERJ platform is no longer manufactured, DRDO and IAF are scouting their availability in secondary markets, while Embraer has also offered Praetor 600 aircraft for the same role. These six AEW&C aircraft will have 240-degree radar coverage. However, there will be better software and more advanced technologies like new gallium nitride-based TR (transmit/receive) modules for the radars.

Earlier, DAC, in September 2021, had cleared the acceptance of necessity (AoN) for the Rs 11,000 crore (equivalent to US\$1.4 billion in 2023) of six Netra Mk 2 using pre-owned Airbus A321 platforms purchased from Air India. The A321s will be sent to France, where they will be modified to military standards, and then will be returned to DRDO, where radars and surveillance suites will be fitted. The contract negotiations for the modifications of the aircraft are ongoing. Realistic timelines for India's forthcoming AEW&C are 5-6 years from now.

The Netra Mk-2 will also have an antenna in the nose in addition to the main dorsal antenna to give 300-degree radar coverage. For the Netra Mk 2 project, Adani Defence & Aerospace has been designated as the L1 entity. There is also a proposal for a 360-degree coverage AEW&C aircraft based on the Airbus A330 airframe, which will have a range of 400 km. On July 19, 2024, IAF issued an RFI to procure six AEW&CS and their respective ground support elements.

The elements of the aircraft system would include a primary radar, electronic surveillance measures (ESM), communication support measures (CSM), command & control (C2), battle management system and networking through data links, Identification Friend or Foe (IFF), and self-protection electronic warfare suite. The primary radar is slated to have a 360-degree azimuth. The jet-engined aircraft is to have an eight-hour endurance with aerial refueling capabilities, cruise altitude of over 40,000 ft (12,000 m), cruise speed of above Mach 0.7 and a range of flying altitude from 500 ft (150 m) to 65,000 ft (20,000 m).

It should be able to track large-bodied aircraft to slow unmanned aerial vehicles with a low radar cross-section at ranges above 550 km. Vendors may either offer aircraft already customized as an AEW&CS or any aircraft meeting the requirements laid out by IAF, including a pre-owned aircraft. Meanwhile, the Indian Navy operates 14 Kamov Ka-31 Helix B helicopter-based AEW&C.

Major Global AEW&C Holding

Currently, the United States Air Force operates 32 Boeing E-3B/C Sentry, and the United States Navy has 55 Grumman E-2C-I/II Hawkeye. The Russian Air Force has nine Beriev A-50. The Egyptian Air Force operates eight Grumman E-2C Hawkeye. The Royal Australian Air Force has six Boeing 737 AEW&C.

The Japan Air Self-Defence Force has 13 Grumman E-2C Hawkeye. NATO operates 14 Boeing E-3A. The Royal Saudi Air Force has five Boeing E-3A. The Swedish Air Force has six Saab S100B. There are many other countries with smaller holdings.

Land Area And Borders

China is the third largest country, with 9,706,961 sq.km. Area. Its land border is 22,457 kilometers long, making it the longest land border of any country. China shares its land border with 14 countries. Plus, it has a coastline of roughly 14,500 kilometers. China's undisputed EEZ is 960,556 sq.km. However, it has disputed claims with Taiwan and others in the East and South China Sea and thus claims a total of 2,236,430 sq.km.

Pakistan is 34th in size, with 881,912 sq.km. Its land border length is 6,774 kilometers. This includes 2,430 kilometers with Afghanistan, 523 kilometers with China, 909 kilometers with Iran, and 2,912 kilometers with India. Pakistan also has a coastline of 1,046 kilometers along the Arabian Sea and the Gulf of Oman. Pakistan has an EEZ of 290,000 sq.km. India is the world's 7th largest country with 3,287,263 sq.km area. India's border length is 15,200 kilometers of land and 7,516.6 kilometers of coastline, including Island territories. This makes India's border the third largest in the world, after China and Russia.

India's border includes 3,323 kilometers with Pakistan, 4,096 kilometers with Bangladesh, 3,488 kilometers with China, 1,751 kilometers with Nepal, 699 kilometers with Bhutan, 1,643 kilometers with Myanmar, and 106 kilometers with Afghanistan (disputed currently). India has an undisputed EEZ of 2,305,143 sq.km.

AEW&C Vis-à-vis Area And EEZ

China has around 50 AEW&C aircraft. That means one platform for 194,139 sq.km. Pakistan has around 10 AEW&C aircraft. That means one platform for 88,191 sq.km. India has six AEW&C aircraft. That means one platform for 547,877 sq.km.

When it comes to EEZ, China has one AEW&C for 447,286 sq.km of EEZ. Pakistan has one for 29,000 sq.km, and India one for 384,190 sq.km. Clearly, it is a much more adverse ratio than that of both China and Pakistan. Purely based on land area, and to match China, India needs 17 AEW&C, and to match Pakistan by area, India needs 37 AEW&C. The numbers required for realistic operations are even higher.

Way Ahead For India

China and Pakistan are the closest of allies, and they both are serious adversaries of India with major land disputes and have been at war with India. The change in dispensation in Bangladesh has added another adversary for India. The Pakistan and Bangladesh militaries have already begun talking with each other and could develop closer relations. The collusion between China and Pakistan has been discussed in India's security establishment. They can exchange intelligence, surveillance, and reconnaissance information. They could share AEW&C pictures and data.

Considering the continental size of the country and the threat perception, the number of AEW&C currently with India is woefully inadequate. It is important to quickly reach a figure of 10 smaller and 10 larger AEW&C. At any given time, only about 80 percent will be available operationally. The requirement has been known for some time, however, the acquisition push has taken place only in the last 3-4 years.

The Make-in-India approach is the correct one. But the process needs to be hastened. India has reasonably mastered the electronics aspects of the AEW&C but must also gain greater experience and ability to make structural changes to the airframe. More money, perhaps, also needs to be put on the table. The time to act is now, lest it becomes too late.

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North Korea says it tested cruise missile system and vows 'toughest' response to U.S.

Source: The Hindu, Dt. 26 Jan 2025,

URL: <https://www.thehindu.com/news/international/north-korea-conducts-strategic-cruise-missile-test/article69141554.ece>

North Korea said Sunday (January 26, 2025) it tested a cruise missile system, its third known weapons display this year, and vowed "the toughest" response to what it called the escalation of U.S.-South Korean military drills that target the North.

The moves suggested North Korea will likely maintain its run of weapons tests and its confrontational stance against the U.S. for now, even though President Donald Trump said he intends to reach out to North Korean leader Kim Jong Un.

The official Korean Central News Agency said Kim observed the test of sea-to-surface strategic cruise guided weapons on Saturday.

The term “strategic” implies the missiles are nuclear-capable. KCNA said the missiles hit their targets after traveling 1,500-kilometer (932-mile) -long elliptical and figure-eight-shaped flight patterns, but that couldn't be independently verified. KCNA cited Kim as saying that North Korea's war deterrence capabilities “are being perfected more thoroughly” and affirming that his country will make “strenuous efforts” to defend stability “on the basis of more powerfully developed military muscle.”

South Korea's Joint Chiefs of Staff said North Korea had launched “several” cruise missiles toward its western waters from an inland area at around 4 p.m. on Saturday. It said South Korean maintains a readiness to “overwhelmingly” repel any provocations by North Korea in conjunction with its military alliance with the U.S.

In a separate statement carried by KCNA on Sunday, North Korea's Foreign Ministry criticized the U.S. for committing “serious military provocations aiming at” North Korea with a series of military exercises with South Korea this month.

“The reality stresses that the DPRK should counter the U.S. with the toughest counteraction from A to Z as long as it refuses the sovereignty and security interests of the DPRK and this is the best option for dealing with the U.S.,” the Foreign Ministry statement said.

DPRK stands for the Democratic People's Republic of Korea, the abbreviation of its formal name. The Foreign Ministry warning was in line with Kim's vows to implement the “toughest” anti-U.S. policy during a year-end political meeting.

North Korea views U.S. military training with South Korea as invasion rehearsals though Washington and Seoul have repeatedly said their drills are defensive in nature. In recent years, the U.S. and South Korea have expanded their military exercises in response to North Korea's advancing nuclear program.

The start of Trump's second term raises prospects for the revival of diplomacy between the U.S. and North Korea, as Trump met Kim three times during his first term. The Trump-Kim diplomacy in 2018-19 fell apart due to wrangling over U.S.-led economic sanctions on North Korea.

During a Fox News interview broadcast Thursday, Trump called Kim “a smart guy” and “not a religious zealot.” Asked whether he will reach out to Kim again, Trump replied, “I will, yeah.”

Many experts say Kim likely thinks he has greater bargaining power than in his earlier round of diplomacy with Trump because of his country's enlarged nuclear arsenal and deepening military ties with Russia.

In South Korea, many worry that Trump might scale back military drills with the Asian U.S. ally and abandon the goal of the complete denuclearization of North Korea and focus on eliminating its long-range missile program, which poses a direct threat to the U.S., while leaving its nuclear attack capabilities against South Korea intact.

On Monday, Trump called North Korea “a nuclear power” as he spoke of his personal ties with Kim during a news conference at the Oval Office after his inauguration. Washington, Seoul and their partners have long shunned describing North Korea as a nuclear state because that could be seen as accepting its pursuit of nuclear weapons in violation of U.N. Security Council resolutions.

After his first summit with Kim in 2018, Trump baffled many in South Korea by unilaterally announcing the suspension of major summertime military drills, calling them “very provocative” and “tremendously expensive.”

North Korea hasn't commented on Trump's latest overture. Sunday's cruise missile tests were the North's first known weapons launches since Trump's inauguration.

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Science & Technology News

India Charts Path for Global Leadership in Frontier Technologies at “Technology Dialogue 2025”

Source: Press Information Bureau, Dt. 24 Jan 2025,

URL: <https://pib.gov.in/PressReleasePage.aspx?PRID=2095961>

Addressing the “Technology Dialogue 2025”, held at the Indian Institute of Science (IISc) here, Dr. Jitendra Singh, Minister of State (Independent Charge) for Science & Technology, unveiled “Vision India Techade”, envisaging global leadership role for India, particularly in innovation and technology.

Dr. Jitendra Singh emphasized that science and technology form the cornerstone of India’s vision to transform into a global hub for innovation, economic growth and solutions to pressing global issues such as climate change and public health. Highlighting the government’s initiatives like the Anusandhan National Research Foundation (ANRF), National Quantum Mission, and the India AI mission, he affirmed India’s commitment to making the 2020s a “Techade for India.”

“Strategic international collaborations are essential for India to cement its place as a global technology leader,” Dr. Jitendra Singh noted. He underscored the need to partner with like-minded nations to advance critical technologies like quantum computing, artificial intelligence, and green hydrogen.

India’s leadership role in global technology governance was highlighted through its co-chairmanship of the Summit for Action on Artificial Intelligence, set to take place in France next month, and its active contributions to the United Nations’ International Year of Quantum Science and Technology in 2025. “Our aim is to foster equitable partnerships that address global challenges while enhancing India’s integration into the global value chain,” he said.

The Minister also focused on integrating cross-sectoral synergies, such as combining AI with biotechnology or quantum computing with secure communication systems, to amplify societal and

economic impact. Ethical technology governance, responsible innovation, and robust intellectual property protections are pivotal, he emphasized, for ensuring that technological progress benefits all.

India's vibrant StarUp ecosystem, with over 100 unicorns and a supportive policy environment, was described as a magnet for foreign direct investments in frontier technologies. Dr. Jitendra Singh stressed the importance of strong intellectual property rights frameworks to attract global investors while fostering equitable technology sharing.

The Indian diaspora's vital role in strengthening international partnerships was another key point. Dr. Jitendra Singh highlighted initiatives like the VAIBHAV Summit and OCI Scientist Scheme, which connect Indian innovators abroad with domestic stakeholders to drive co-innovation and capacity-building.

In conclusion, the Minister said, "India's technological journey is about contributing meaningfully to global progress while ensuring sustainable and inclusive growth." With its talent, dynamic startups, and global partnerships, India is poised to lead the world into a future powered by transformative technologies.

The event brought together dignitaries, industry leaders, and academics from around the world to discuss priorities for India's International Technology Engagement Framework (ITEF).

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ISRO's historic 100th launch this month: Advanced navigation satellite with Made-in-India atomic clocks

Source: The Indian Express, Dt. 25 Jan 2025,

URL: <https://indianexpress.com/article/india/100th-launch-isro-nvs-satellite-longer-lifespan-indigenous-atomic-clocks-9797713/>

In its 100th launch, the Indian Space Research Organisation (ISRO) is geared to send off a 2,250-kg navigation satellite on-board GSLV-F15 from Sriharikota on January 29 at 06.23 am, the space agency said.

The NVS-02 is the second of the five second-generation satellites developed by the space agency to replace the existing satellites in the country's navigation constellation Indian Regional Navigation Satellite System.

The new generation of satellites have a longer lifespan of 12 years and are also equipped with indigenously developed, more accurate atomic clocks. The new generation of satellites also utilise L1 frequency, which is most commonly used in the US Global Positioning System (GPS), and is likely to lead to more utilisation by smaller devices such as fitness trackers.

The launch on January 29 will be the 17th flight of the GSLV vehicle, with the 11th flight using the indigenously developed cryogenic engine. The mission will last just over 19 minutes, with the satellite being injected into a 170 x 36,577 km Geostationary Transfer Orbit — an orbit that satellites use to go into the high geostationary orbit.

IRNSS — sometimes referred to as NavIC or Navigation with Indian Constellation — is a seven satellite system that provides positioning, navigation and timing services over the Indian mainland and 1,500 km in its neighbourhood.

The first satellite in the constellation IRNSS-1A was launched in 2013, with a mission life of 10 years. The next two satellites IRNSS-1B and 1C were launched in the subsequent years. Replacements were needed for some of the satellites in the constellation even before the end of their mission life since the atomic clocks on-board the satellites malfunctioned.

A satellite-based positioning system determines the location of objects by accurately measuring the time it takes for a signal to travel to and from it using the atomic clocks on board. The constellation, however, ran into more trouble. One of the replacement satellites IRNSS-1H did not make it to orbit after the heat shield on ISRO's most reliable launch vehicle PSLV failed to open.

The new generation of NavIC satellites utilises L1 frequency to widen the services, most commonly used in the US GPS. This is likely to lead to more utilisation by smaller devices such as fitness trackers. NVS-01, the first of the five second-generation satellites was launched in 2023. There were also criticisms that the services of the navigation constellation were not being optimally utilised. A 2018 report by the CAG said that even though the Cabinet cleared funding of ₹200 crore to develop user receivers in 2006, work on the project started only in March 2017, by which time seven launches had already taken place. And, several years of mission life of the initial satellites had been wasted.

Since then, however, several receivers and applications for the navigation constellation have been developed. With cellphone chipsets capable of receiving IRNSS data becoming available, several of the new phones are capable of using signals from the Indian constellation.

The first of the new generation of navigation satellites was launched in May last year by the same launch vehicle.

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Padma Awards 2025 honours India's global impact on Science and Engineering

Source: News Nine, Dt. 26 Jan 2025,

URL: <https://www.news9live.com/science/padma-awards-2025-honours-indias-global-impact-on-science-and-engineering-2806146>

The Padma Awards, one of India's highest civilian honours have been announced for 2025, recognising the contributions of awardees in various fields, including Science and Engineering. Vinod Dham, considered the Father of the Pentium Processor, has been awarded the Padma Bhushan for 'distinguished service of high order'. Dham is a citizen of USA. The Padma Shri for distinguished service have been awarded to 113 awardees, including Ashutosh Sharma, MD Srinivas and Surinder Kumar Vasal from India, Ajay V Bhatt and Sethuraman Panchanathan from USA as well as Chetan E Chitnis from France.

Ashutosh Sharma from IIT Kanpur has works with thin films and nanofabrication, and served as the Secretary to the Department of Science and Technology, Government of India between 2015 and 2021. MD Srinivas is an expert on the traditional Indian schools of astronomy and mathematics, and promotes a more utilitarian approach to science that is more open-minded than the strict western traditions. Surinder Kumar Vasal is a geneticist who has worked throughout his life to improve crops, and has developed varieties of maize with higher protein content. Chetan E Chitnis is at the forefront of fighting malaria, is investigating the workings of the malaria parasite, and is developing vaccines.

Technologists recognised with Padma Awards

The awards this year recognise a number of technologies who shaped the consumer electronics that we use on a daily basis. Vinod Dham is one of the pioneers in Silicon Valley, and developed chips for the semiconductor industry. He is an angel investor and works closely with startups. Ajay V Bhatt worked with interfaces between machines and developed a number of ports for computers, including USB and PCIe. Sethuraman Panchanathan is a computer scientist who worked with making computers more accessible, including haptic user interfaces and is the Director of the US National Science Foundation (NSF).

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ISRO appoints M. Mohan as director of Liquid Propulsion Systems Centre in Thiruvananthapuram

Source: The Hindu, Dt. 27 Jan 2025,

URL: <https://www.thehindu.com/news/national/kerala/isro-appoints-m-mohan-as-director-of-liquid-propulsion-systems-centre-in-thiruvananthapuram/article69145535.ece>

M. Mohan has been appointed as director of the Liquid Propulsion Systems Centre (LPSC) located at Thiruvananthapuram in Kerala.

Mr. Mohan, who is currently Director (Projects) at the Vikram Sarabhai Space Centre (VSSC), succeeds V. Narayanan as the LPSC director. ISRO issued his appointment order on January 25. V. Narayanan assumes charge as new ISRO chief, succeeding S. Somanath.

Mr. Mohan was director of the Human Space Flight Centre from June 2023 to June 2024. Prior to that, he has held various positions, including Associate Director, VSSC (Research and Development), project director of the Geosynchronous Satellite Launch Vehicle (GSLV) and mission director of successful GSLV-F08/GSAT-6A and GSLV-F11/GSAT-7A missions in 2018.

He has also held the positions of project director of the Cryogenic Upper Stage (CUS) and the Space Capsule Recovery Project (SRE-2). He was also system leader of the Moon Impact Probe (MIP) project for the Chandrayaan – 1 mission.

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Indian space programme breaks into 2025 on ‘mission mode’

Source: The Hindu, Dt. 27 Jan 2025,

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Just as 2024 was the year India developed a vision for its space programme, 2025 is likely to have the programme in mission mode. The PSLV-C60 mission, underway as the year began, laid the foundations for Chandrayaan-4 and the Bharatiya Antariksh Station.

Forthcoming test flights will move India closer to human spaceflight, soon to receive a helping hand from a third launch pad approved for construction at Sriharikota, continuing work on the Next-Generation Launch Vehicle (NGLV), and a change of guard at ISRO.

SpaDeX, a team effort

On December 30, 2024, the PSLV-C60 mission lifted off from the Satish Dhawan Space Center (SDSC) in Sriharikota. About 15 minutes after liftoff, the rocket delivered the Space Docking Experiment (SpaDeX) satellites at slightly different velocities into a 475-km circular orbit.

Then ISRO chairman S. Somanath said the nominal date for the docking attempt would be January 7, 2025. M. Sankaran, director of the UR Rao Satellite Centre (URSC), said this was to allow the satellites to power up with its solar cells.

Indian private company Kepler Aerospace provided ground station-as-a-service support for the mission alongside ISRO. It was able to simultaneously command the two SpaDeX satellites and provided “comprehensive mission support in under a month”.

Swiss space situational awareness company s2a systems also shared details of the distance between the two satellites on social media.

This separation reached far-rendezvous conditions, i.e. 10-20 km, on January 2, 2025, and started moving closer on January 6. ISRO had originally planned a webcast for January 7, but pushed it by two days before calling it off altogether.

On January 8, the organisation said when the inter-satellite distance was reduced from 500 m to 225 m, the drift between the satellites was greater than expected. So it re-increased the separation to 6-8 km on January 9 and started over.

On January 10, the satellites were put on ‘hold’ mode to maintain an inter-satellite distance of 1.5 km, then moved closer together on January 11 and ‘held’ at 230 m. On January 12, the inter-satellite distance was reduced further to 105 m, subsequently to 15 m and then to 3 m. At this point, ISRO decided to move the satellites apart once again so it could analyse data from the satellites’ sensors before the next attempt.

According to s2a systems, the inter-satellite separation grew to 10.9 km on January 12 and from there launched the next docking attempt. They came within 2.6 km of each other on January 13 and to 900 m on January 15.

Finally, on January 16, ISRO issued a statement saying the two satellites had successfully docked and stabilised themselves in orbit. ISRO thus made history by completing its first in-orbit rendezvous and docking. Later that day, both satellites were controlled together from one of them, a feat necessary for lunar and space-station docking.

ISRO said the next steps involved transferring power from one satellite to the other and, later, undocking.

POEM4, the orbital testbed

After the PSLV-C60 mission deployed the SpaDeX satellites, the rocket's fourth stage was moved to a 350-km circular orbit and had its fuel dumped (a process called passivation, done so that the fuel doesn't explode and create a debris field). In this form, it was ready for the PSLV Orbital Experimental Module (POEM4) phase of its mission, when the fourth stage was to orbit the earth like a satellite. It carried 24 payloads: 14 from ISRO and 10 from academia and private industry.

ISRO's Relocatable Robotic Manipulator-Technology Demonstrator tested its movement and relocation capability by moving from one part of POEM4 to another. The Debris Capture Robotic Arm Manipulator also moved its arm but ISRO wasn't clear about whether it managed to capture the piece of debris tethered to the payload. The Compact Research Module for Orbital Plant Studies (CROPS) had cowpea seeds germinate in orbit and studied the leaves.

On December 31, 2024, Manastu Space's Vyom 2U payload fired its green propulsion system for 30 seconds, tilting the POEM4 stage by 24°. The system used the company's proprietary green fuel MS289. Manastu fired the system once again on January 13, this time having POEM4 perform a somersault with an angular velocity of 1.5° per second.

Similarly, Bellatrix Aerospace fired its RUDRA payload for 60 seconds to impart an angular velocity of 1.4° per second and turn POEM4 around by 80°.

N Space Tech's payload SwetchaSAT-V0 established communications with its ground station. The payload, designed and built in-house, tested communications in the UHF to Ku bands.

The SJC Institute of Technology and the Upagraha Amateur Radio Club at URSC said they had successfully received data from BGS-ARPIT, their jointly-developed amateur radio messaging payload. Many amateur radio operators also shared images received from BGS-ARPIT on amateur radio mailing lists.

GalaxEye also announced the successful performance of its payload GLX-SQ. The company said it had achieved all mission objectives, including using GLX-SQ to create a synthetic-aperture radar (SAR) image.

TakeMe2Space successfully conducted an in-orbit demonstration of its MOI-TD payload. An artificial intelligence unit, it uploaded "large models from the ground station, [executed] external code on the satellite, and [downlinked] the ... results." The company said it faced "a critical failure in the camera hardware", however.

Amity University said its Amity Plant Experimental Module in Space (APEMS) yielded positive results in its attempt to grow a plant in controlled conditions onboard POEM4.

Change of guard

The new ISRO Chairman V. Narayanan (centre) arrives at Thiruvananthapuram airport on Saturday following the successful completion of the SpaDeX mission on January 16. | Photo Credit: Nirmal Harindran/The Hindu

While the SpaDeX and POEM4 missions were being executed in space, V. Narayanan took over from Somanath as ISRO chairman on January 14. Narayanan was director of the Liquid Propulsion Systems Center, Thiruvananthapuram, and led work on the cryogenic and semi-cryogenic engines. He also chaired a committee to examine the failure of the Chandrayaan-2 moon-landing attempt.

Aboard Transporter 12

Three Indian companies flew their payloads onboard SpaceX's Transporter 12 mission on January 15. They were part of another 131 payloads that the Falcon 9 rocket delivered to orbit.

First, Pixxel Space's three Firefly hyperspectral satellites became the first private Indian satellite constellation; three more are to fly in future. The company announced on social media that all three satellites had deployed their solar arrays and had started generating power, were stabilised, and had established two-way communication links.

Second, Digantara launched its Space Camera for Object Tracking for space situational awareness and to augment its ground capabilities. The company said the satellite was generating solar power and had stabilised. The satellite will now move to its commissioning phase to prepare for its mission: to precisely track objects in low-earth orbit.

Third, XDLINX Labs' Elevation 1 miniaturised communications satellite, built for US-based Almagest Space Corporation on its XDSATNS platform, was assembled, integrated, and tested by Ananth Technologies. The satellite has a small E-band satellite communications payload that sent a "hello from space" message to mark its start of mission.

Space tech and science

The Union cabinet approved the construction of a third launch pad at SDSC at a cost of Rs 3984.86 crore. It's expected to be built by 2029, to serve as a backup for the second launch Pad as well as support for human spaceflight facilities and ISRO's NGLV.

ISRO also successfully tested its Vikas engine's ability to restart, i.e. stop firing, then start again, at its propulsion complex in Mahendragiri. The engine was fired for 60 seconds, shut-off for 120 seconds, and fired again for seven seconds. ISRO has more tests planned ahead of certifying the engine's readiness to operate in this way in the atmosphere.

The fourth stage liquid engine of the PSLV already has restart capability in the vacuum of space.

Finally, on January 6, ISRO released the first tranche of data collected by its Aditya-L1 mission, exactly a year after the mission had started to study the sun and its effects on the inner solar system.

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“Gigantic Leap” For Chinese Space Program! Astronauts Claim Massive Breakthrough In Artificial Photosynthesis

Source: The EurAsian Times, Dt. 26 Jan 2025,

URL: <https://www.eurasiantimes.com/gigantic-leap-for-chinese-space-program/>

The crew of the Shenzhou-19, a spaceflight to Tiangong, carried out the first in-orbit demonstration of artificial photosynthesis technology, producing oxygen and the components needed for rocket fuel. This achievement came ahead of a long-term space exploration program, including a crewed moon landing before 2030.

The idea behind artificial photosynthesis is the same as that of real photosynthesis, which is how plants turn carbon dioxide and water into glucose and oxygen. The Chinese astronauts used a drawer-shaped apparatus with semiconductor catalysts to turn water and carbon dioxide into oxygen and ethylene, a substance that can be turned into rocket fuel.

The Chinese state television channel CCTV ran a broadcast on January 19, saying, “This technology mimics the natural photosynthesis process of green plants through engineered physical and chemical methods, utilizing carbon dioxide resources in confined spaces or extraterrestrial atmospheres to produce oxygen and carbon-based fuels.”

“The work is expected to provide critical technical support for human survival and exploration in outer space,” the report added.

The testing centered on an array of technologies that would be critical to the generation of resources and the survival of humans in space, including the conversion of carbon dioxide at room temperature, the accurate management of gas and liquid flows in microgravity, and the high-sensitivity, real-time detection of reaction products. The China Manned Space Agency (CMSA) reportedly said that this innovation will likely serve as a technical basis for the nation’s upcoming manned deep-space exploration missions.

This is not the first time that photosynthesis has occurred in space. The International Space Station (ISS) has earlier conducted photosynthesis experiments for plant growth and to understand the functioning of microgravity.

According to a report in the Hong Kong-based South China Morning Post (SCMP), the ISS mostly relies on electrolysis for life support, which uses power from the station’s solar panels to split water into hydrogen and oxygen to give passengers breathable air. According to the report, which cited Katharina Brinkert, a catalysis specialist from the University of Bremen in Germany, the process is effective but energy-intensive. It would not be practical for long trips to the moon or Mars.

The new technology tested by Chinese astronauts considerably lowers energy usage by operating effectively at room temperature and standard air pressure, in contrast to traditional high-temperature, high-pressure carbon dioxide reduction techniques. The process can be modified to generate different products, such as formic acid as a precursor for sugar synthesis or methane or ethylene for propulsion.

Chinese state news agency Xinhua stated that the experiment is a massive breakthrough because it is believed that reducing reliance on Earth's resources and achieving interplanetary resource utilization requires the use of in-situ resources, such as carbon dioxide from the Martian atmosphere or lunar regolith, to generate fuel and oxygen.

China's Space Ambitions

China's Tiangong space station is positioned to possibly assume a key role in space exploration and research in the 2030s as the International Space Station (ISS) nears the end of its operational life. China apparently created its space station after being denied access to the ISS because of worries about its space agency's close ties to the military, particularly the People's Liberation Army (PLA).

The Tiangong space station has been operational for nearly two years. Its full assembly was completed in November 2022, following the addition of the Mengtian science module. China Academy of Space Technology's (CAST) senior manager Li Ming announced more facility upgrades to expand Tiangong's capabilities during the International Astronautical Congress in Milan in October last year.

China is also working on establishing a lunar base in collaboration with Russia. In fact, it recently revealed updated plans for the two-phase development of its ambitious moon base project. As per the plan, China would be in charge of the facility, which is a component of the International Lunar Research Station (ILRS) project, with early assistance from Russia.

The moon base is expected to be finished by 2035 and will be situated close to the lunar south pole in the first phase. The lunar base will be expanded into a wider network in the second phase, which should be completed by 2050. This network will contain exploration stations on the lunar surface, including at the equator, the far side of the moon, and the south pole, with a central hub in lunar orbit.

Late last year, China disclosed that it is producing "moon bricks," which mimic soil taken from the moon's surface and might be used as potential building materials for a future lunar base. The upcoming Chang'e 7 lunar mission will also include a flag that will ostensibly flap on the moon, according to the latest reports. Additionally, China's historic efforts to transport samples from Mars to Earth could begin as early as 2028, two years ahead of schedule. Liu Jizhong, the lead mission designer, stated in September 2024 that the nation's Tianwen-3 mission would conduct two launches "around 2028" to recover the Martian samples.

China seeks to become the space leader by 2050. Its comprehensive plan goes beyond exploring the moon, Mars, and deep space and includes investigating subjects like quantum mechanics, the Universe's origins, habitable planets, and extraterrestrial life. Against this backdrop, using space resources for lunar and deep space exploration missions will allow China to obtain self-sufficiency and aid its space ambitions. The latest artificial photosynthesis is one step in that direction.

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