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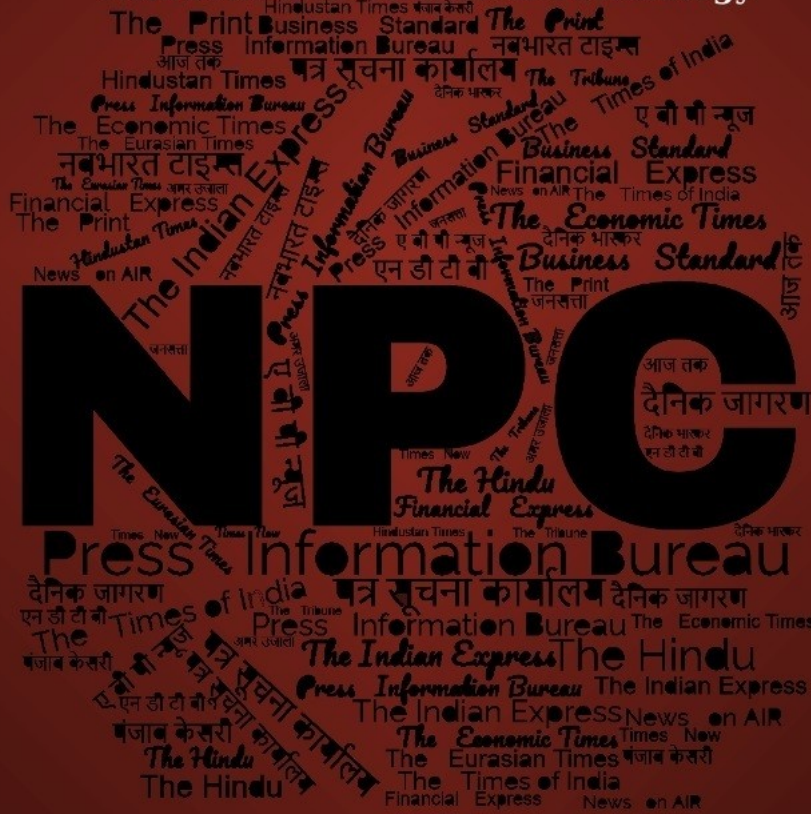
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# समाचार पत्रों से चयनित अंश Newspapers Clippings

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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*Tue, 27 Aug 2024*

### **IIM Vizag to train DRDO scientists**

The Indian Institute of Management Visakhapatnam inaugurated a Certificate Program in R&D Management specifically designed for scientists from the Defence Research & Development Organization (DRDO) on Monday. This programme sees participation from 39 officers representing 36 DRDO labs across India.

During the inauguration, Prof. B. Srirangacharyulu, the programme director, welcomed the participants and outlined the training modules, which encompass a wide range of topics essential for effective R&D management. These include Concepts and Principles of R&D Management, Project Management, Simulation, Organizational Behaviour & Human Relations Management, R&D Processes, R&D Support Functions, Technology Management, Commercialization and Utilization, Nurturing Innovation & Creativity, and Risk Management.

The event was graced by Dr. Y. Sreenivas Rao, Director General of Naval Systems & Materials (NS&M), who served as the chief Guest. In his inaugural address, he emphasised the critical need for fostering strong networks among scientists across various DRDO labs. He pointed out that collaboration is vital for innovation and the generation of groundbreaking ideas, suggesting that the cross-pollination of concepts from different labs can effectively address complex challenges in research and development.

He also addressed the importance of conflict management within teams, particularly in high-stakes environments like DRDO, where timely project execution is crucial. He highlighted that effective communication, mutual respect, and clear delegation of responsibilities are key to minimizing delays and ensuring the smooth execution of projects.

<https://www.deccanchronicle.com/southern-states/andhra-pradesh/iim-vizag-to-train-drdo-scientists-1819251>

# Defence Strategic: National/International



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

**Ministry of Defence**

*Fri, 23 Aug 2024*

## **Raksha Mantri Shri Rajnath Singh & US Secretary of Defense Mr Lloyd Austin hold bilateral talks in Washington DC**

**Discuss defence cooperation, industrial collaboration & regional  
security**

Raksha Mantri Shri Rajnath Singh held a bilateral meeting with the US Secretary of Defense Mr Lloyd Austin in Pentagon, Washington DC on August 23, 2024. They held wide-ranging discussions on bilateral defence cooperation, industrial collaboration, regional security and other international issues.

Shri Rajnath Singh highlighted the various co-development and co-production opportunities in India in the areas identified in the India-US Defence Industrial Cooperation Roadmap, which was adopted last year.

Both Ministers expressed happiness on the conclusion of the Security of Supplies Arrangement (SOSA) between India and US. The SOSA signed yesterday in Washington DC encourages the defence industrial ecosystems of both countries to work together, and enhances the supply chain resilience. They also welcomed the signing of the Memorandum of Agreement between India and US regarding the Deployment of Liaison Officers. India shall be accordingly deploying the first Liaison Officer to the Headquarters Special Operations Command in Florida, US.

Both Ministers appreciated the progress made in operationalising the Indo-Pacific Maritime Domain Awareness, a Quad initiative and lauded the ongoing efforts by India to enhance the Maritime Domain Awareness for the partners in the Indian Ocean Region. They welcomed the



ongoing Indian participation in the Combined Maritime Forces (CMF) and noted that India shall deploy Indian Navy personnel in CMF's Combined Task Force 150 headquarters in 2025.

The Raksha Mantri and Secretary Austin commended the efforts of the India-US Defence Acceleration Ecosystem (INDUS-X) for establishing the Defence Innovation bridge between the two countries. They appreciated INDUS-X establishing robust networks across start-ups, industry, academia, and governments, accelerating the adoption of cutting-edge technologies and enhancing war-fighting capabilities of both sides. The upcoming INDUS X Silicon Valley Summit in September 2024 shall witness announcements of several key initiatives.

The meeting at Pentagon was preceded by a solemn wreath laying ceremony by Shri Rajnath Singh at the Arlington National Cemetery. The Raksha Mantri and US Secretary of Defense looked forward to meeting again at the next India-US 2+2 Ministerial Dialogue.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2048377>



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

**Ministry of Defence**

*Sat, 24 Aug 2024*

## **Raksha Mantri Shri Rajnath Singh interacts with senior leadership of US defence companies in Washington DC**

### **Outlines various emerging co-development & co-production opportunities in defence sector in India**

Raksha Mantri Shri Rajnath Singh interacted with the senior leadership of US defence companies in Washington DC on August 23, 2024 in an industry round-table organised by US India Strategic Partnership Forum. He outlined the various emerging co-development and co-production opportunities in the defence sector in India. The progressive reforms undertaken by the Government of India have encouraged many foreign Original Equipment Manufacturers, including from the US, to set up manufacturing units in India, develop Joint Ventures, and also to make India their alternate export base. The planned co-production of GE 414 aero-engines in India shall be a significant milestone in India-US bilateral relations.

Shri Rajnath Singh highlighted that 'Partnership' and 'Joint Efforts' are the two keywords that differentiate India's defence industry partnership with other nations.

The event saw the attendance of senior leadership from prominent US defence and technology companies such as Boeing, GE, General Atomics, General Dynamics Land Systems, L3 Harris, Lockheed Martin, Raytheon Technologies, Rolls Royce, and ThayerMahan. In addition, few Indian companies such as ideaForge, Tata Sons and Tsecond, along with senior leaders from The Cohen

Group attended the interaction with the Raksha Mantri. During the interaction, the business leaders briefly outlined their ongoing projects & future plans for India, and provided valuable feedback.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2048549>



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

**Ministry of Defence**

*Sat, 24 Aug 2024*

## **Raksha Mantri Shri Rajnath Singh meets US National Security Advisor Mr Jake Sullivan in Washington DC**

**Discusses evolving geopolitical situation, key regional security issues & defence industrial collaboration**

**RM interacts with US defence industry leaders; Says, India wants to work closely with US in defence for capability building & industrial partnership to address emerging challenges**

Raksha Mantri Shri Rajnath Singh met the US National Security Advisor Mr Jake Sullivan at the White House in Washington DC on August 23, 2024. They deliberated on the evolving geopolitical situation and certain key regional security issues. They also discussed the ongoing defence industrial collaboration projects between India and US, and potential areas where the industries of the two countries could work together.

The Raksha Mantri also interacted with the senior leaders of the US defence industry at a round-table organised by US India Strategic Partnership Forum in Washington DC. The round-table was attended by a large number of US defence and technology companies.

Shri Rajnath Singh emphasised that India welcomes US investment and technology collaboration, and is ready with a skilled human resource base, robust pro-FDI and pro-business ecosystem, and large domestic market. India looks forward to closely working with US across the domains of defence for capability building and for an abiding technology & industrial partnership which can address emerging challenges, he added. Later, the Raksha Mantri briefly met a delegation from US India Business Council.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2048402>

## **Rajnath visits US Navy testing facility in Memphis as India plans something similar**

Defence minister Rajnath Singh on Saturday visited a modern US Navy testing facility for ships and submarines at Memphis in Tennessee at a time when India is looking at setting up a similar facility for locally produced platforms, the defence ministry said on Sunday.

Singh visited the William B Morgan large cavitation channel (LCC) at the Naval Surface Warfare Center in Memphis where senior officials briefed him on one of the world's largest and most technically advanced high-speed, variable-pressure water tunnel facilities.

Senior navy and DRDO (Defence Research and Development Organisation) officials accompanied him.

“The discussions intend to support the ongoing proposal for establishment of a similar facility for indigenous design and development in India,” the defence ministry said in a statement.

The LCC is part of the Naval Surface Warfare Center Carderock Division, one of the US Navy's preeminent research and development facilities that specialises in critical ship and submarine design.

Operational since 1991, it provides significant cost savings for testing large-scale models of advanced ship and submarine system designs and full-scale torpedoes in a controlled environment, according to the US Navy.

It permits the US Navy to measure submarine and surface ship power, efficiency and propeller noise by using models in a controlled but realistic environment. The facility has commercial use too.

Singh was greeted by deputy under secretary of the US Navy for Policy Anne Gebhards, and Naval Surface Warfare Center and Undersea Warfare Center Commander Rear Admiral Todd Evans.

“Witnessed the pathbreaking experiments at the facility. India and the US look forward to work together and benefit from each other's experiences,” Singh wrote on X.

Singh's Memphis visit came on the back of meetings with US national security advisor Jake Sullivan and secretary of defence Lloyd Austin in Washington. These talks spanned an array of critical areas including the impact of global developments on geopolitics, pressing regional security dynamics, broadening cooperation in the Indo-Pacific region and deepening defence industrial collaboration.

Singh arrived in Washington on August 22 on a four-day visit that is being closely watched as India is negotiating deals worth billions of dollars with the US, including the purchase of the General Atomics MQ-9B remotely piloted aircraft systems and the joint production of GE F414 engines in the country.



Earlier, Singh also interacted with captains of several American defence companies in Washington, including General Atomics and GE, and outlined the emerging co-development and co-production opportunities in India while enumerating reforms initiated by the government to make the country an attractive destination for foreign original equipment manufacturers and an alternative export hub.

In 2023, India and the US concluded a new road map for defence industrial cooperation with the goal of fast-tracking technology cooperation and co-production in critical areas, including air combat and land mobility systems, intelligence, surveillance, and reconnaissance, munitions, and the undersea domain.

<https://www.hindustantimes.com/india-news/rajnath-visits-us-navy-testing-facility-in-memphis-as-india-plans-something-similar-101724648569719.html>

## THE ECONOMIC TIMES

Sat, 24 Aug 2024

### **US approves sale of Anti-Submarine Warfare Sonobuoys to India for \$52.8 mn**

The United States Secretary of State, Antony Blinken, has approved a possible foreign military sale of anti-submarine warfare Sonobuoys and related equipment to India at an estimated cost of USD 52.8 million.

The Defence Security Cooperation Agency delivered the required certification, notifying Congress of this possible sale today, the US Defence Security Cooperation Agency said in a release. Notably, the Defence Security Cooperation Agency is an agency within the United States Department of Defence.

"The Government of India has requested to buy AN/SSQ-53G High Altitude Anti-Submarine Warfare (HAASW) sonobuoys; AN/SSQ-62F HAASW sonobuoys; AN/SSQ-36 sonobuoys; technical and publications and data documentation; US Government and contractor engineering and technical support; and other related elements of logistics and program services and support. The estimated total cost is USD 52.8 million," the agency stated.

This proposed sale will support US' foreign policy and national security objectives by helping to strengthen the United States-India strategic relationship and improving the security of a major defence partner that continues to be an important force for political stability, peace, and economic progress in the Indo-Pacific and South Asia regions.

The proposed sale will also improve India's capability to meet current and future threats by enhancing its capacity to conduct anti-submarine warfare operations from its MH-60R helicopters. India will have no difficulty absorbing this equipment into its armed forces.

The agency further added that the proposed sale of this equipment and support will not alter the basic military balance in the region.

The principal contractor(s) will be Sparton Corporation, located in De Leon Springs, FL, or Undersea Sensor Systems Inc. (USSI), located in Columbia City, IN, or a combination of both. There are no known offset agreements proposed in connection with this potential sale, it added.

<https://economictimes.indiatimes.com/news/defence/us-approves-sale-of-anti-submarine-warfare-sonobuoys-to-india/articleshow/112753344.cms>

# THE ECONOMIC TIMES

*Fri, 23 Aug 2024*

## **US, India sign pact for reciprocal priority support to promote national defence**

The United States (US) and India have signed an agreement to provide reciprocal priority support for goods and services that promote national defence. The arrangement will enable both countries to acquire the industrial resources they need from one another to resolve unanticipated supply chain disruptions to meet national security needs.

"Two important documents have been signed in Washington DC as Raksha Mantri Shri @rajnathsingh's visit to the United States begins. Senior defence officials from both the sides concluded the Security of Supplies Arrangement (SOSA), and Memorandum of Agreement regarding the Assignment of Liaison Officers, " RMO India took to X to post.

The Security of Supply Arrangement (SOSA) was signed by Vic Ramdass, Principal Deputy Assistant Secretary of Defence for Industrial Base Policy, on behalf of the United States, and Samir Kumar Sinha, Additional Secretary and Director General (Acquisitions), on behalf of the Indian Ministry of Defence.

India is the 18th SOSA partner of the US after Australia, Canada, Denmark, Estonia, Finland, Israel, Italy, Japan, Latvia, Lithuania, the Netherlands, Norway, Republic of Korea, Singapore, Spain, Sweden, and the United Kingdom.

"This Security of Supply Arrangement represents a pivotal moment in the US - India Major Defence Partner relationship and will be a key factor in strengthening the US- India Defence Technology and Trade Initiative (DTTI)," said Ramdass.

He said he looked forward to hosting the next DTTI meeting this fall to deepen cooperation between defence industrial bases and pursue bilateral codevelopment, co-production, and co-sustainment initiatives. Under the arrangement, the US and India commit to support one another's priority delivery requests for procurement of critical national defence resources.

The US will provide India assurances under the US Defense Priorities and Allocations System (DPAS), with program determinations by Department of Defence and rating authorization by the

Department of Commerce (DOC). India will in turn establish a government-industry Code of Conduct with its industrial base, where Indian firms will voluntarily agree to make every reasonable effort to provide the US priority support.

"With an expanding global supply chain for DOD, SOSAs are an important mechanism for DoD to strengthen interoperability with US defence trade partners. The Arrangements institute working groups, establish communication mechanisms, streamline DoD processes, and proactively act to allay anticipated supply chain issues in peacetime, emergency, and armed conflict. They are also a useful tool in developing investment strategies to ensure redundancy and security," according to a statement by the US Department of Defence.

Meanwhile during his US visit, the Defence Minister will hold a bilateral meeting with his American counterpart Secretary Llyod Austin. He will also meet the US Assistant to the President for National Security Affairs Jake Sullivan.

The visit comes in the backdrop of the growing momentum in India-US relations and defence engagements at multiple levels. The visit is expected to further deepen and broaden the India-US Comprehensive Global Strategic Partnership, the Ministry of Defence stated.

A day earlier, the Defence Minister said that he would discuss areas of strategic interests and seek to strengthen defence cooperation between India and US with Lloyd Austin.

<https://economictimes.indiatimes.com/news/defence/us-india-sign-pact-for-reciprocal-priority-support-to-promote-national-defence/articleshow/112729282.cms>

## THE ECONOMIC TIMES

*Mon, 26 Aug 2024*

### **Indian Navy's frontline warship 'Mumbai' docks in Sri Lanka; coincides with visit by three Chinese warships**

Indian Navy's frontline warship INS 'Mumbai' on Monday docked at the port of Colombo, on a day when three Chinese Navy vessels berthed at the same harbour in Sri Lanka.

Indian Naval Ship 'Mumbai' is on a three-day visit to the island nation, the Sri Lanka Navy said in a press release. The 163-metre-long Destroyer, which is manned by a crew of 410 members, was welcomed by the Sri Lanka Navy in compliance with naval traditions.

This is the ship's first visit to any port in Sri Lanka and will be the eighth port call by Indian ships this year, the Indian High Commission said in a press release on Sunday.

Meanwhile, three Chinese People's Liberation Army Navy warships -- "HE FEI", "WUZHISHAN" and "QILIANSHAN" -- also arrived at the port of Colombo on a formal visit on Monday morning, the Sri Lanka Navy said.

The "HE FEI" is a 144.50-metre-long destroyer, crewed by 267 personnel, while the "WUZHISHAN" is a 210-metre-long Landing Platform Dock manned by 872 crew members and the "QILIANSHAN" is a 210-metre-long Landing Platform Dock, with 334 crew members.

INS Mumbai -- the third of the Delhi class destroyers -- will bring essential spares for the Sri Lanka Airforce (SLAF)-operated Dornier maritime patrol aircraft -- the pilots and flight navigators of which are being trained by the Indian Navy.

Apart from this, the Indian Navy also supports the aircraft's maintenance with a technical team and spares, according to the High Commission. Upon the ship's arrival, its commander, Captain Sandeep Kumar, called on the Commander of Western Naval Area, Rear Admiral Chinthaka Kumarasinghe at the Western Naval Command Headquarters.

During the ship's stay in Colombo, its crew members will visit some of the tourist attractions of the country, the press release said. "A briefing on the operational functions of the ship will be conducted aboard INS Mumbai for Sri Lanka Navy personnel," it added.

The ship will also undertake joint activities with the Sri Lanka Navy, such as sports fixtures, Yoga and beach cleaning, according to the High Commission. INS Mumbai will engage in a Passage Exercise (PASSEX) with a Sri Lanka Navy ship off the coast of Colombo upon its departure on August 29.

The indigenously built INS Mumbai was commissioned into the Indian Navy on January 22, 2001. Its visit is the eighth port call in Sri Lanka by Indian ships this year.

Earlier this year, INS Kabra, Karanj, Kamorta and Shalki visited Sri Lanka, in addition to Indian Coast Guard ships Samarth, Abhinav and Sachet, the High Commission said.

Cash-strapped Sri Lanka considers both India and China equally important partners in its task to restructure its external debt. In August 2022, Chinese navy vessel Yuan Wang 5 docked at Hambantota in southern Sri Lanka for replenishment.

<https://economictimes.indiatimes.com/news/defence/indian-navys-frontline-warship-mumbai-makes-first-visit-to-sri-lanka/articleshow/112806289.cms>

## THE ECONOMIC TIMES

*Sat, 24 Aug 2024*

### **India and Sri Lanka conclude regional military exercise 'Mitra Shakti'**

The 10th edition of the annual bilateral exercise 'Mitra Shakti' between the militaries of India and Sri Lanka, aimed to enhance their interoperability and mutual understanding, has concluded, the Indian High Commission said on Saturday.

The two-week-long exercises were held from August 12 at the Army Training School at Maduru Oya in Sri Lanka.

The exercise aims to enhance interoperability and mutual understanding between the armed forces and provides an opportunity to deepen further the close defence relationship based on professional respect, personal bonding and extensive training interaction, the high commission said.

The exercise helps in building proficiency in tackling transnational terrorism, conducting joint tactical operations and building combat skills, the statement said.

It also provides an ideal platform for sharing each other's experiences and learning from the best practices being followed, it further said. The exercise is one of the largest bilateral exercises being conducted in the region, the mission said.

Based on the success of previous editions of 'Mitra Shakti', the exercise was recently upgraded from a combined arms concept to bi-service level engagement which signifies the willingness of both countries to enhance defence cooperation to fight the menace of terrorism and other common threats effectively.

The military exercises were held in consonance with India's 'Neighbourhood First' policy and vision of 'Security and Growth for all in the Region (SAGAR)', the high commission said.

<https://economictimes.indiatimes.com/news/defence/india-and-sri-lanka-conclude-regional-military-exercise-mitra-shakti/articleshow/112760791.cms>



*Sun, 25 Aug 2024*

## **Zelenskyy seeks tie-up with India for producing drones, electronic warfare systems**

Ukraine President Volodymyr Zelenskyy pitched for greater cooperation with India in high-end technologies across several areas such as agriculture, cybersecurity and defence, stressing co-production of drones, electronic warfare systems, among others. He said he discussed these during talks with Prime Minister Narendra Modi.

At a press interaction, Mr. Zelenskyy said Ukraine had increased the level of its private companies, specially in areas such as drones, sea drones and cybersecurity. "And I said to PM, we will be very ready to share with you these products and we will be happy if it can be co-production, and we decided that our teams will begin to work on different issues. During war, I think this is very important as we need to strengthen war economy... Of course we need win-win between our nations."

Elaborating on the different high-end technologies in response to a question from The Hindu, he said, "It's about agriculture, de-mining, medicine, security such as drones, electronic warfare systems, it's a lot, its connections... against cyber attacks. We are ready to speak about it, ready to

speak about sea drones, a lot of different technologies. We had good agreements before the war. We are open with all of this and we are ready to co-produce for both our markets.”

“Of course we can do more after the war as today the priority is defending ourselves,” he noted. “But we are ready to begin this work, war will finish anyway and we know it...”

India operates a large inventory of military equipment of both Russian and Ukrainian origin. Following the war in Ukraine, India has seen supplies and spares held up for sometime. As a result, Indian armed forces attempted to diversify and reduce dependence by turning to domestic companies as well as seeking alternative vendor base in other countries.

Some joint ventures between Ukraine manufacturers and Indian private sector are in the works to produce some of the spares as well as carry out maintenance in India.

On defence cooperation, the joint statement issued after the talks underlined the importance of defence cooperation between the two leaders and said they agreed to continue to work towards facilitating a stronger relationship between the defence entities in both countries, including “through joint collaborations and partnerships for manufacturing in India and cooperation in emerging areas”. The sides agreed to hold the second meeting of the Indian-Ukrainian Joint Working Group on Military-Technical Cooperation, established under the 2012 Defence Cooperation Agreement, in the near future in India.

### **Focus on agriculture**

There is considerable focus on agriculture and pharmaceuticals in the talks as reflected in the joint statement and the agreements signed. One of the four agreements signed was on cooperation in the fields of agriculture and food industry. The objective of the agreement is to expand mutually beneficial cooperation in these areas by promoting ties in areas of information exchange, joint scientific research, exchange of experience, cooperation in agricultural research and creation of joint working groups.

“Agriculture is not only about growing but we can also think about hubs, how to save and secure agricultural hubs during long periods of time,” Mr. Zelenskyy said.

In the recent past, Mr. Zelenskyy had made a pitch for co-production with other countries too as Ukraine needs large amounts of arms and ammunition as the war is in the third year. “Our priority is the development of defence production using modern technologies, including the production of shells, missiles, and drones in Ukraine, in cooperation with global leaders in this field,” he posted on X last year.

“During the meeting with representatives of defence companies and associations from the U.S., the U.K., Germany, France, Türkiye, Sweden, and the Czech Republic, we discussed the prospects for partnership and joint arms production,” he had said, adding that Ukraine was ready to offer special conditions to companies willing to work together with the country in the defence production sector.

<https://www.thehindu.com/news/international/zelenskyy-seeks-tie-up-with-india-for-producing-drones-electronic-warfare-systems/article68563355.ece>



## **Explained: The two new US-India agreements, signed as part of growing defence ties**

India and the US have signed a Security of Supply Arrangement (SOSA) and Memorandum of Agreement regarding the Assignment of Liaison Officers, the latest in a series of bilateral military agreements that have enhanced defence and security cooperation between the two countries over the past decade.

During Defence Minister Rajnath Singh's four-day official visit that concluded on Sunday (August 25), the partner nations agreed to advance priority co-production projects including jet engines, unmanned platforms, munitions, and ground mobility systems under the 2023 US-India Roadmap for Defence Industrial Cooperation.

### **Two new agreements**

**SOSA:** Under SOSA, the US and India will provide reciprocal priority support to each other for goods and services that promote national defence. It will "enable both countries to acquire the industrial resources they need from one another to resolve unanticipated supply chain disruptions to meet national security needs", the US Department of Defense (DoD) said in a statement.

India is the 18th SOSA partner of the US. While SOSA, according to the DoD, are an important mechanism to strengthen interoperability with US defence trade partners, it is legally non-binding. The DoD has been working to conclude another agreement with India, the Reciprocal Defence Procurement (RDP) Agreement, which will be binding.

RDP Agreements are intended to promote rationalisation, standardisation, interchangeability, and interoperability of conventional defence equipment with US allies and other friendly governments. The US has signed RDP Agreements with 28 countries so far.

**MOU ON LIAISON OFFICERS:** The Memorandum of Agreement regarding the Assignment of Liaison Officers is a progression on a decision taken earlier to increase information-sharing between India and the US, and to post Indian armed forces officers in key strategic US Commands. India will deploy the first Liaison Officer to the US Special Operations Command headquarters in Florida.

### **India-US cooperation milestones on defence**

The vision for bilateral defence cooperation was encapsulated in the September 2013 Joint US-India Declaration on Defence Cooperation and the 2015 Framework for the US-India Defence Relationship, in which the two countries committed themselves to increasing cooperation in the sector.

**2023 ROADMAP:** The roadmap for defence industrial cooperation released last year envisioned the conclusion of SOSA and the RDP Agreement. The US endorsed the integration of the Indian

defence industry into global supply chains, and extended support to India to develop naval and maritime infrastructure to create an Indo-Pacific regional hub for ship and aircraft repair and maintenance.

Priority areas of cooperation identified in the roadmap included Intelligence, Surveillance, and Reconnaissance (ISR), Undersea Domain Awareness, Air Combat and Support, including Aero engines, munitions systems, and mobility.

**iCET:** In January 2023, the US-India initiative on Critical and Emerging Technology (iCET) was discussed to expand the strategic technology partnership and defence industrial cooperation. National Security Advisors Ajit Doval and Jake Sullivan discussed opportunities for greater cooperation in critical and emerging technologies, including co-development and co-production, and ways to deepen connectivity across our innovation ecosystems.

**INDUS-X:** In June 2023, during Prime Minister Narendra Modi's official state visit to the US, the DoD and Ministry of Defence launched the India-US Defence Acceleration Ecosystem (INDUS-X), which took forward the commitment to build a defence innovation bridge under iCET.

**FOUNDATIONAL AGREEMENTS:** In 2002, India and the US had signed the General Security of Military Information Agreement (GSOMIA) to facilitate sharing of military information. Between 2016 and 2020, the two sides signed four more agreements.

The Logistics Exchange Memorandum of Agreement (LEMOA) of 2016 established the basic terms, conditions, and procedures for reciprocal provision of logistic support, supplies, and services between the two militaries.

In 2018, the Communications Compatibility and Security Agreement (COMCASA), an India-specific version of the Communications and Information Security Memorandum of Agreement (CISMOA), was signed to secure military communication between the countries, facilitate access to advanced defence systems, and enable India to optimally utilise its existing US-origin platforms.

The Basic Exchange and Cooperation Agreement (BECA) of 2020 aimed to facilitate the sharing of military information including maps, nautical charts, and other unclassified imagery and data.

Additionally, in 2019, the Industrial Security Annex (ISA) to the GSOMIA was signed to facilitate the exchange of classified information between the defence industries of the two countries.

### **Other deals and sales**

In 2016, the US designated India as a Major Defence Partner. Commensurate with this designation, in 2018, India was elevated to Strategic Trade Authorisation tier 1 status, which gave it licence-free access to a range of military and dual-use technologies regulated by the US Department of Commerce.

Earlier in 2012, the Defence Trade and Technology Initiative (DTTI) agreement was signed to promote industrial cooperation and defence trade between the two countries.

There is also a Memorandum of Intent between the US Defence Innovation Unit (DIU) and the Indian Defence Innovation Organization-Innovation for Defence Excellence (DIO-iDEX).

Big-ticket Indian military procurements from the US include MH-60R Seahawk multirole helicopters, Sig Sauer Rifles, and M777 ultra light howitzers.

Negotiations are underway to manufacture GE F-414 jet engines in India for the LCA MK 2 fighters, and to procure 31 MQ-9B High-Altitude Long-Endurance (HALE) UAVs. Deliveries of the GE-F404 engines for the LCA Tejas Mark-1A are underway.

<https://indianexpress.com/article/explained/explained-global/two-new-us-india-agreements-a-short-history-of-growing-defence-ties-9534655/>



*Sat, 24 Aug 2024*

## **Army's counter-terror operations to get new teeth with 'Xploder', 'Agniastra'**

The Indian Army's counter-terror and counter-insurgency operations in Kashmir, Northeast, and other affected areas of the country are poised for a pivotal tactical leap with two game-changing homemade solutions devised by its own Army Design Bureau (ADB).

The technology of two revolutionary innovations—Xploder and Agniastra—developed by the ADB's Major Rajprasad, is being transferred to an unnamed private firm for mass production. The Transfer of Technology (ToT) is being facilitated by the Foundation of Innovation & Technology Transfer, IIT Delhi.

On Friday, the ToT of the innovations was undertaken by production agencies in the presence of the Vice Chief of Army Staff Lt Gen N.S. Rajasubramani.

The process acquires significance in view of the fact that 2024 has been declared as the 'Year of Tech Absorption' and can be looked upon as another small but vital step in pursuance of 'Atmanirbharta' or self-reliance in defence production.

A versatile system designed for a range of combat and operational roles, the 'Xploder' is an advanced all-terrain Unmanned Ground Vehicle (UGV) that can conduct unmanned reconnaissance, deliver explosive payloads, and remotely dispose Improvised Explosive Devices (IEDs). Equipped with a self-destruct mode for effective hideout clearance, it can also be deployed in disaster relief operations.

The 'Agniastra' is a multi-target portable detonation system that can target multiple locations from extended ranges. It can be manually placed or delivered using UAVs/UGVs.

These two systems are expected to transform both conventional and counter-terrorism operations, enabling precise room intervention, bunker demolitions, and large-scale infrastructure destruction.

In June 2024, another ADB innovation 'Vidyut Rakshak', also developed by Major Rajprasad was inducted into the Indian Army. 'Vidyut Rakshak' is a IoT-enabled power generator monitoring,

protection, and control system. ADB's WEDC (Wireless Electronic Detonation System) is already in-service with the Corps of Engineers.

The Indian Army is actively pursuing a plan to position itself as a future-ready force, capable of addressing both traditional and emerging security challenges.

[https://www.theweek.in/news/defence/2024/08/24/armys-counter-terror-operations-to-get-new-teeth-with-xploder-agniastra.html#:~:text=A%20versatile%20system%20designed%20for,Improvised%20Explosive%20Devices%20\(IEDs\).](https://www.theweek.in/news/defence/2024/08/24/armys-counter-terror-operations-to-get-new-teeth-with-xploder-agniastra.html#:~:text=A%20versatile%20system%20designed%20for,Improvised%20Explosive%20Devices%20(IEDs).)



Mon, 26 Aug 2024

## **Indian Army To Strengthen Anti-Drone Arsenal Amid Growing Threats of Unmanned Aerial Systems**

The Indian Army is stepping up its defences against the increasing threat posed by Unmanned Aerial Systems (UAS) with a range of new countermeasures. While it has already deployed various radars, Integrated Drone Detection Systems, and advanced weaponry, the military is now seeking to bolster its defences further with the acquisition of sophisticated Anti-UAS High Power Microwave (AUHPM) systems.

The latest Request For Information (RFI) issued by the Indian Army indicates an upgrade in their counter-UAS strategy. The RFI calls for the procurement of the Anti-UAS High Power Microwave (Mk II) System, which is expected to offer advanced surveillance, detection, and tracking capabilities. The system will feature a microprocessor for precise targeting solutions and a High Power Microwave weapon system capable of either "hard kill" (destruction) or "soft kill" (disruption) operations.

The document specifies that the army seeks systems with at least 50 per cent indigenous content, also reflecting a push towards *aatmanirbharta* (self reliance) in defence technology.

### **Uas, A Bigger Threat**

Recent global events have highlighted the growing importance of UAS in modern warfare.

In April 2024, Iran launched a major drone attack against Israel, deploying over 170 drones in one of the largest such attacks in military history. Israel's effective countermeasures were notable. Similarly, in the ongoing conflict between Ukraine and Russia, UAVs and drones have been extensively utilised.

India's national security needs utmost priority as both of its neighbouring adversaries, Pakistan and China, advance their drone technologies. China already possesses substantial counter-UAS capabilities, while Pakistan is also ramping up its drone production and countermeasures. Both countries have developed a variety of UAVs with Pakistan taking help of China for the same.

## **The Challenge**

Experts have pointed out that while larger UAS systems like MQ-9 and Bayraktar TB2 are relatively easier to detect and engage, smaller drones present a more challenging target due to their size.

Countermeasures for such platforms include jamming and spoofing (soft kill) and destruction (hard kill). However, each strategy has its challenges. For instance, jamming an entire frequency band can disrupt other operations, while spoofing faces technical hurdles like powerful encryptions. Hard kill methods, although seemingly straightforward, require range, precision, and advanced systems.

### **A Combined Approach: Soft And Hard Kill**

“Successfully countering these threats requires a combination of both soft and hard kill strategies,” said a senior defence official.

Countries like Russia and Ukraine have effectively employed a mix of hard and soft kill strategies in their ongoing conflict. Systems like Krashuka, Leer-3, Repellent-1, and Pole 21 are renowned for successful jamming and spoofing, while net guns, high-energy lasers, and HPM devices are used to destroy targets.

### **India’s Preparedness**

India currently possesses systems to counter UAS threats but is continuously upgrading and modifying them to address the advanced capabilities of modern drones.

“We have measures in place, but we are also seeking upgrades. For example, we are exploring smart ammunition for our guns, such as pre-fragmented rounds. Work is ongoing in this direction. Our Integrated Drone Detection System (IDDS) and Drone Kill System (DKS) are operational, but we must stay ahead of evolving threats,” the official added.

The Indian military is focused on integrating both soft and hard kill solutions. Both the Indian Army and Air Force are responsible for air defence, and integrating advancements will enhance their ability to counter aerial threats. The need for hybrid systems and a Common Air Defence Tracked Platform (CADET) is critical.

“We are seeking HPM systems with a range of no less than 5 km. The system should operate in various terrains, including high altitudes up to 4,500 metre, plains, deserts, and coastal areas. We have provided flexibility in design and operational scope, but our fundamental requirements are clear — we want the best systems available,” the officer concluded.

<https://www.news18.com/india/indian-army-to-strengthen-anti-drone-arsenal-amid-growing-threats-of-unmanned-aerial-systems-9027727.html>

## **Is Ukraine's new Palianytsia missile the answer to Russian dominance?**

: Ukraine says it has a new longrange weapon to strike deep into Russia without asking permission from allies - a homegrown combination of missile and drone that the defense minister vowed Monday would provide "answers" to a wave of Russian bombings.

The Palianytsia was created due to urgent necessity, Ukrainian officials said, as Russia has dominated the skies since the outbreak of the war in February 2022 and Ukraine's Western allies have placed conditions on use of their long-range missiles in Russia.

On Monday, a wave of Russian missiles and drones targeted Ukraine's electrical infrastructure in the largest such attack in weeks.

"Defenders of life should have no restrictions on weapons, as long as Russia uses all kinds of its own weapons," President Volodymyr Zelenskyy said in a Telegram message following the attacks. Zelenskyy confirmed on Saturday the existence of the Palianytsia, named after a type of Ukrainian bread and a word so notoriously difficult to pronounce correctly that it was used to unmask suspected spies early in the war. The Ukrainian president called it "a new class" of weapon.

Saturday, which marked Ukraine's 33rd anniversary of independence from the former Soviet Union, also saw the first use of the new weapon, targeting a Russian military installation in the occupied territory, officials said without providing details. Defense Minister Rustem Umerov promised Monday the weapon would be used again soon in response to the overnight attack on Ukraine.

"Ukraine is preparing its response. Weapons of its own production," he wrote on his Facebook page. "This once again proves that for victory, we need longrange capabilities and the lifting of restrictions on strikes on the enemy's military facilities."

A Ukrainian military video hinted that its range is up to 700 kilometers (430 miles) - on par with the US-supplied ATACMS. It showed a map with various airfields, including Russia's Savasleyka air base, which lies within that range, adding that the Palianytsia can reach at least 20 Russian airfields.

The United States and other Western allies provide long-range weapons to Ukraine but restrict it from launching them deep into Russia for fear of escalating the war. Ukraine can target the border regions but wants to go deeper to attack Russia's military infrastructure.

The Institute for the Study of War said Russia was "leveraging sanctuary space in deep rear areas." It estimated at least 250 militarily significant targets in Russia were within range of the ATACMS missiles, but current restrictions allow Ukraine to strike only 20 of them.



Ukraine's technology minister, Mykhailo Fedorov, told The Associated Press in his first interview about the new weapon that the next step was to scale up the production. "I think this will be a game changer because we will be able to strike where Russia doesn't expect it today," he said.

Fedorov declined to elaborate on the range or current supply, citing security reasons, but said that he has been involved in the projects for developing domestic missiles since the end of 2022.

Ukraine's battlefields have become a deadly testing lab for new weapons and new adaptations of old ones. Both Ukrainian and Russian forces have rigged off-the-shelf equipment with explosives and military-grade infrared cameras; Russia has retrofitted Soviet-era unguided bombs with GPS harnesses; and Ukraine's underwater drones have crippled Russia's Black Sea fleet. But the new weapon has been a long-term goal of Ukraine.

One of the specialists involved in the long-range missile project said it was "a completely new development, from scratch" that began about 18 months ago.

"This is not an extension of an old Soviet project," said the specialist, speaking on condition of anonymity to safeguard the project's secrecy. The missile has a solid-fuel booster that accelerates it, followed by a jet engine, the specialist said.

Ukraine says its inability to fight back against Russian long-range weapons has deadly consequences. Ukraine's Commander-in-Chief Gen. Oleksandr Syrskyi said Russia has launched 9,627 long-range missiles and Ukraine's defense shot down only a quarter of them, and that more than half the Russian targets were civilian.

The specialist and Fedorov said each missile costs less than \$1 million, and the military is turning to the private sector to bring down production costs further. "The private market generates solutions incredibly quickly," the minister said.

As of this year, private companies have become the main suppliers of drones for the Ukrainian army, including those now striking inside Russia and the underwater ones that have repeatedly struck the Russian Black Sea fleet, said Fedorov. "All types of missiles will be available in Ukraine," he said.

"If we have our own weapons like this, we will feel more independent and confident." Fedorov added that he believed Russia's vast size could also be its vulnerability.

"It's impossible to produce enough air defense systems to protect such a large territory," he said. "For us, this opens up the possibility of operating deep behind enemy lines."

<https://economictimes.indiatimes.com/news/defence/is-ukraines-new-palianytsia-missile-the-answer-to-russian-dominance/articleshow/112821355.cms>

*Mon, 26 Aug 2024*

## **Special Report: US Army innovation unit testing unmanned aerial, ground platforms**

As the US Army's top officials attempt to acquire the latest in robotics, 3D printing, and radio networks, one unit is exploring how it might evolve existing capabilities to address soldier problems starting from the division level.

The 3rd Infantry Division within the 18th Airborne Corps tested some commercial technologies in new ways through the Marne Innovation Center at the most recent National Training Center (NTC) rotation in Fort Irwin, California. These trials included the first time a remotely operated M113 armoured personnel carrier (APC) with a mine-clearing charge performed a live-fire demonstration, first use of a new radio mesh network capability, and continued experimentation with tethered unmanned aircraft systems (UASs).

During the exercise, the corps conducted the first armour brigade-level, combined arms breach, in totality, in the past 20 years at night at the NTC, said Major Adam Young, operations officer for the 5–7 Cavalry Squadron, 1st Armored Brigade Combat team – also known as the Raider Brigade. The rotation traversed 120 miles starting in Santa Fe, New Mexico, and ending in Fort Irwin.

<https://www.janes.com/osint-insights/defence-news/c4isr/special-report-us-army-innovation-unit-testing-unmanned-aerial-ground-platforms>

*Mon, 26 Aug 2024*

## **India seeks sonobuoys for MH-60Rs**

India has requested the sale of three types of air-launched anti-submarine warfare (ASW) sonobuoys for use with its new Sikorsky MH-60R helicopter fleet, according to the US Department of State.

The US Defense Security Cooperation Agency (DSCA) said on 23 August that New Delhi seeks to procure AN/SSQ-53G High Altitude Anti-Submarine Warfare (HAASW) sonobuoys, AN/SSQ-62F HAASW sonobuoys, and AN/SSQ-36 sonobuoys in a deal potentially worth USD52.8 million.

The US Secretary of State approved the possible Foreign Military Sale on 23 August, which also includes technical publications and data documentation, DSCA added.

The AN/SSQ-53G is a multifunctional directional frequency analysis and recording (DIFAR) sonobuoy combining a passive directional and calibrated wide-band capability. The sonobuoy uses an electronic function selection (EFS) and/or command function select (CFS) to choose the sensor modes prior to or after the sonobuoy's deployment.

The sonobuoy features four acoustic sensor modes and has a GPS location-reporting capability. It can operate to a depth of 300 m and can be launched from an altitude of 9,144 m.

The AN/SSQ-62F is a fifth-generation, all-digital, active directional command active sonobuoy system (DICASS) that provides a GPS capability over earlier variants. The sonobuoy can operate at a depth of 460 m (1,509 ft). Its maximum launch altitude is likely more than 9,000 m.

The AN/SSQ-36 is an older bathythermograph buoy transmitter that records profiles on water-temperature to assist the ASW aircraft's ability to analyse data from other sonobuoys.

<https://www.janes.com/osint-insights/defence-news/c4isr/india-seeks-sonobuoys-for-mh-60rs>

## THE ECONOMIC TIMES

Sat, 24 Aug 2024

### **Chinese military's new focus: Winning wars against "strong enemies, opponents"**

From its decades-old doctrine of winning local wars, China's military is shifting its focus to winning wars against "strong enemies and opponents," a top defence official has said, amidst the mounting challenges Beijing faces on multiple fronts, including from the US.

President Xi Jinping has also directed the People's Liberation Army (PLA) to improve its strategic ability to defend the country's sovereignty and development interests.

Celebrating the 120th anniversary of Deng Xiaoping, widely hailed as the paramount leader and the architect of modern China who rebuilt the country after the disastrous Mao Zedong era, Xi not only praised his outstanding contributions to the ruling Communist Party of China (CPC), the country and the world but also highlighted his emphasis to build a modern military.

"The best way to honour Deng is to continue advancing the cause of socialism with Chinese characteristics that he initiated," Xi, said in his address to a meeting held to mark Deng's birth anniversary.

He also recalled that Deng had highlighted the need to build the PLA into a strong, modernised and well-organised force, and to have fewer but better troops. Xi, also the Commander-in-Chief of the PLA, on Thursday told the military to improve its "strategic ability to defend national sovereignty, security and development interests," the Hong Kong-based South China Post reported.

Significantly, at a PLA commemoration, Miao Hua, a member of the Central Military Commission, the military's top decision-making body headed by Xi, said: "In the new journey, we should ... focus on strengthening capabilities to defeat strong enemies and opponents."

Earlier on Wednesday, an article in the official PLA Daily said Deng had made the strategic judgment that "world wars can be postponed or avoided" in the 1980s, but China now faced "great changes unseen in a century."

"We must ... always maintain strategic clarity on the possible risks of war, make full preparations for military struggle, effectively deter war and resolutely win the war." The latest directive to the PLA to win wars against "strong enemies and opponents" is regarded as a major course correction for the Chinese military considering the mounting challenges China faces on multiple fronts.

Until recently, the CPC's directive to the PLA was to develop the ability to win local wars considering China's long-festering border dispute with India besides maritime disputes involving the disputed South China Sea and East China Sea with Japan.

China's relations with Taiwan, which Beijing claims is part of its own, have also worsened in recent times. China claims most of the South China Sea while the Philippines, Vietnam, Malaysia, Brunei and Taiwan counter its claim.

As recently as in 2022, in his speech at the Party congress, Xi had set "victory in local wars" as a goal and told the PLA to "improve training and preparation for war in all aspects and improve the ability of the army to fight and win."

"We will strengthen the normal and diversified use of military forces, carry out military struggles with determination and flexibility, shape the security posture, contain crises and conflicts, and win local wars," he said then.

Analysts said the strategic shift from winning local wars to defeating "strong enemies and opponents" was in line with Beijing's thinking about the risks it faces and its increasing focus on security, particularly in the face of the growing rivalry between China and the United States on multiple fronts.

<https://economictimes.indiatimes.com/news/defence/chinese-militarys-new-focus-winning-wars-against-strong-enemies-opponents/articleshow/112768275.cms>

# THE ECONOMIC TIMES

Sat, 24 Aug 2024

## **Why US needs Bangladesh so much, a US Naval Institute article reveals**

A few months before Bangladesh Prime Minister Sheikh Hasina resigned and fled the country after a coup which eventually replaced her government with an interim one, she claimed that she was

offered a hassle-free re-election in the January 7 polls if she allowed a foreign country to build an air base inside the country.

"If I allowed a certain country to build an air base in Bangladesh, then I would have had no problem," Daily Star Bangladesh had quoted Hasina as saying. She, however, did not name the country that had made the offer to her but emphasised that the "offer came from a white man".

When asked about her response to the offer, the PM said she gave the same reply as she did in 2001 when the US offered to sell the country's gas to India. "I've clearly said that I'm the daughter of Father of the Nation Bangabandhu Sheikh Mujibur Rahman. . . we won our Liberation War, I don't want to come to power by renting part of the country or handing it over to some other country and I don't need power," she said.

At that time, many thought Hasina was talking of the United States. The sudden coup led any to believe that the US orchestrated toppling of Hasina's elected government and replacing it with one by people of its liking. Hasina has had troubled relations with it for quite some time now.

The US, the biggest buyer of Bangladesh's exports, had become more vocal in its calls for a free and fair election, imposing visa curbs on several members of Hasina's ruling party and military officials in September.

After fleeing to India, Hasina again claimed the US played a role in her ouster. "I could have stayed in power if I had surrendered the sovereignty of Saint Martin Island and allowed America to dominate the Bay of Bengal," she said.

The US, however, has rejected the allegations of its involvement in the Bangladesh crisis, including the protests in the country that led to the deaths of hundreds of people. Refuting all the reports and rumours, the White House Press Secretary, Karine Jean Pierre, said in a media briefing a week after the coup, "So, we have had no involvement at all. Any, reports or rumours that the United States government was involved in these, in these events is simply, simply false. That is not true."

"This is a choice for and by the Bangladeshi people. We believe that the Bangladeshi people should determine the future of the Bangladeshi government, and that's where we stand. Any allegations, certainly we will continue to say, and what I have said here is simply untrue," Jean Pierre said.

### **Why the US needs Bangladesh**

The US may have had no role to play in the coup against Hasina and forming an interim government, but Bangladesh holds critical strategic value for the US and a government more cooperative than Hasina's can better serve American strategic interests in the region.

In June last year, Hasina alleged that the US had intended to acquire St Martin's Island to build a military base in exchange for opposition Bangladesh Nationalist Party's electoral victory. She claimed that the BNP, if brought to power, would sell the island to the US, a step she vowed never to allow while in office.

Though the US rejected her claim, a military foothold for the US in Bangladesh can put it into a strong position against China. An article published by the US Naval Institute, a non-profit, independent forum, has detailed the military importance of Bangladesh to the US, arguing that the

country could be a key logistics node for the US Navy or help blockading operations supporting broader US Navy goals in the Indo-Pacific region.

"Cooperating with the Bangladesh Navy, the U.S. Navy could use those bases to observe Chinese projects. Moreover, Bangladesh's strategic vantage at the top of the Bay of Bengal funnel could provide the United States with an advantage in guarding the Malacca Strait, which is vital to the Chinese economy and industry," the article by Bangladeshi scholars says.

The article says that while Bangladesh's own position on Indo-Pacific security "aligns with the rules-based order that the US Navy seeks to enforce, the lack of clear alignment and the absence of concurrent maritime strategy and doctrinal documents reveal a slow-moving and risk-averse strategy". "It is the lack of access to Western platforms and financing that has driven Bangladesh to source the submarines from China.

If proper financing, technology, and platform support were offered, Bangladesh could be a potential candidate for modern Western diesel-powered conventional attack submarines," the article says. The article says since the US has no bases in the Bay of Bengal, during any potential conflict, Bangladesh's naval bases could be a hub for logistics and a safe harbor for the US Navy.

"Bangladesh currently is building a deep seaport in Matarbari, Cox's Bazar with the assistance of Japan, one of the most trusted and important U.S. allies since World War II. Japan could help build a bridge between these two countries to ensure that the USN could use Matarbari deep-sea port as a naval operations base during any future war by blockading potential Chinese shipments that bypasses the Malacca to use CMEC (China-Myanmar Economic Corridor) as an alternative. This would provide the United States leverage against China in the Bay of Bengal region," the article says.

The article also says Bangladesh can provide the US long-range ISR (Intelligence, Surveillance and Reconnaissance) advantages over China.

<https://economictimes.indiatimes.com/news/defence/why-us-needs-bangladesh-so-much-a-us-naval-institute-article-reveals/articleshow/112767120.cms>





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

**Ministry of Science & Technology**

*Sat, 24 Aug 2024*

## **Cabinet approves BioE3 (Biotechnology for Economy, Environment and Employment) Policy for Fostering High Performance Biomanufacturing**

The Union Cabinet, chaired by the Prime Minister Shri Narendra Modi, today approved the proposal 'BioE3 (Biotechnology for Economy, Environment and Employment) Policy for Fostering High Performance Biomanufacturing' of the Department of Biotechnology.

The salient features of BioE3 policy include innovation-driven support to R&D and entrepreneurship across thematic sectors. This will accelerate technology development and commercialization by establishing Biomanufacturing & Bio-AI hubs and Biofoundry. Along with prioritizing regenerative bioeconomy models of green growth, this policy will facilitate expansion of India's skilled workforce and provide a surge in job creation.

Overall, this Policy will further strengthen Government's initiatives such as 'Net Zero' carbon economy & 'Lifestyle for Environment' and will steer India on the path of accelerated 'Green Growth' by promoting 'Circular Bioeconomy'. The BioE3 Policy will foster and advance future that is more sustainable, innovative, and responsive to global challenges and lays down the Bio-vision for Viksit Bharat.

Our present era is an opportune time to invest in the industrialization of biology to promote sustainable and circular practices to address some of the critical societal issues-such as climate change mitigation, food security and human health. It is important to build a resilient biomanufacturing ecosystem in our nation to accelerate cutting-edge innovations for developing bio-based products.

High performance biomanufacturing is the ability to produce products from medicine to materials, address farming and food challenges, and promote manufacturing of bio-based products through integration of advanced biotechnological processes. To address the national priorities, the BioE3 Policy would broadly focus on the following strategic/thematic sectors: high value bio-based chemicals, biopolymers & enzymes; smart proteins & functional foods; precision biotherapeutics; climate resilient agriculture; carbon capture & its utilization; marine and space research.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2048569>



*Sat, 24 Aug 2024*

## **Cabinet approves the Department of Science and Technology scheme namely ‘Vigyan Dhara’**

The Union Cabinet, chaired by the Prime Minister Shri Narendra Modi, today approved continuation of the three umbrella schemes, merged into a unified central sector scheme namely ‘Vigyan Dhara’ of Department of Science and Technology (DST).

The scheme has three broad components:

- 1.Science and Technology (S&T) Institutional and Human Capacity Building,
- 2.Research and Development and
- 3.Innovation, Technology Development and Deployment.

The proposed outlay for the implementation of the unified scheme ‘Vigyan Dhara’ is Rs.10,579.84 crore during the 15th finance Commission period from 2021-22 to 2025-26.

The merger of the schemes into a single scheme would enhance efficiency in fund utilization and establish synchronization among the sub-schemes/programs.

The primary objective of the 'Vigyan Dhara' scheme is to promote S&T capacity building as well as research, innovation and technology development towards strengthening the Science, Technology and Innovation ecosystem in the country. Implementation of the scheme will strengthen the S&T infrastructure of the country by fostering well-equipped R&D labs in the Academic Institutions.

The scheme endeavours to promote research in areas such as basic research with access to the international mega facilities, translational research in sustainable energy, water, etc. and collaborative research through international bilateral and multilateral cooperation. It will also contribute to building critical human resource pool to strengthen the science and technology landscape and expand the R&D base of the country towards improving the Full-Time Equivalent (FTE) researcher count. Focused interventions will be taken up to enhance the participation of women in the field of Science and Technology (S&T) with the ultimate goal of bringing gender parity in Science, Technology and Innovation (STI). The scheme would reinforce the efforts of the government towards promoting innovations at all levels, starting from school level to higher education, and for the industries and startups through targeted interventions. Significant support will be extended to increase collaboration between academia, Government, and also with industries.

All the programs proposed under the ‘Vigyan Dhara’ scheme would be aligned with the 5-year goals of DST towards realising the vision of Viksit Bharat 2047. The research and development component of the scheme will be aligned in line with the Anusandhan National Research

Foundation (ANRF). Implementation of the scheme would follow the globally prevailing yardsticks while in alignment with the national priorities.

Background:

Department of Science & Technology (DST) acts as the nodal department for organising, coordinating and promoting S&T activities in the country. Three central sector umbrella schemes were being implemented by DST towards promoting Science, Technology and Innovation (STI) in the country viz. (i) Science and Technology (S&T) Institutional and Human Capacity Building, (ii) Research and Development and (iii) Innovation, Technology Development and Deployment. These three schemes have been merged into the unified scheme 'Vigyan Dhara'.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2048574>

# THE ECONOMIC TIMES

Sat, 24 Aug 2024

## India launches its 1st reusable hybrid rocket 'RHUMI-1'

India launched its first reusable hybrid rocket 'RHUMI- 1', developed by the Tamil Nadu-based start-up Space Zone India with Martin Group, from Thiruvudandhai in Chennai on Saturday. The rocket, carrying 3 Cube Satellites and 50 PICO Satellites, was launched into a suborbital trajectory using a mobile launcher.

These satellites will be collecting data for research purposes on Global warming and Climate change. RHUMI Rocket is equipped with a generic-fuelbased hybrid motor and electrically triggered parachute deployer, RHUMI is 100% pyrotechnic-free and 0% TNT.

The mission RHUMI is led by Anand Megalingam, the founder of the Space Zone, under the mentorship of Dr. Mylswamy Annadurai Former Director of ISRO Satellite Centre (ISAC). The RHUMI-1 rocket combines the advantages of both liquid and solid fuel propellant systems to improve efficiency and reduce operational costs.

Space Zone India is an aero-technology company in Chennai that aims to provide low-cost, long-term solutions in the space industry. Space Zone India (SZI) provides hands-on training experience on Aerodynamic principles, Satellite Technology, Drone Technology and Rocket Technology. It also creates awareness of the career options in this industry.

SZI works with Private institutions, Engineering and Art and Science colleges, and Private and Government schools. In 2023, through mission 'Dr. APJ Abdul Kalam Students Satellite Launch - In 2023' over 2,500 students from government, tribal, and public schools across the country, contributed in designing and construction of a student satellite launch vehicle. The vehicle could carry a payload of 150 Pico satellite research experiment cubes.

<https://economictimes.indiatimes.com/news/science/india-launches-its-1st-reusable-hybrid-rocket-rhumi-1/articleshow/112754548.cms>

## **First National Space Day marks Chandrayaan-3 success**

The Indian Space Research Organisation (Isro) on Friday celebrated the first-ever National Space Day, marking the anniversary of the Chandrayaan-3 mission that made India the first country to land a probe on the lunar south pole, in a grand event where the nation laid out its ambitious roadmap for space exploration for the next two decades which included plans for more lunar mission, an indigenous space station, a new rocket, as well as placing a man on the moon by 2040.

At a ceremony in New Delhi's Bharat Mandapam – attended by President Droupadi Murmu, Isro chairman S Somanath and minister of science and technology Jitendra Singh – the country's space agency also announced ambitious plan aimed at removing space debris from the Earth's orbit, a concern echoed by many, including President Droupadi Mumu.

Speaking at the event, the President expressed about the increasing effort and appreciated Isro's efforts to remove them. "Space debris can cause problems for space missions," she said. "I am also happy to note that India is moving forward to make all its space missions debris-free by 2030."

Murmu also underscored Isro's achievements despite its humble beginnings. "It was a glorious moment for all the Indians when Chandrayaan-3 landed on the moon. I saw the live telecast of that moment, I was so proud that day like other Indians... Along with the strides in the space sector, Isro also plays a vital role in the social and economic development of the country. I am confident that our country will make continuous progress in space science and we will continue to set new standards of excellence," she said.

The projects that Isro laid out for the next 21 years include expanding the Chandrayaan mission – the project that has clearly been the standout among all of Isro's achievements on the global stage. Plans for two more lunar missions (also to the south pole) have been laid out.

The first is Chandrayaan-4, which aims to bring rock samples from the lunar surface back to Earth after a soft landing. The mission, slated for launch in 2027, will expand on the technology developed in Chandrayaan-3 by adding elements like lunar docking, precision landing, sample collection and a safe journey back to Earth.

Chandrayaan-5, which will be in collaboration with Japan's space agency JAXA, will feature an Indian lander and a 350kg Japanese rover designed to explore these challenging lunar areas.

"Last year we successfully launched the Chandrayaan-3 mission. We never imagined the impact that is going to create out of this accomplishment... We were asked to prepare a long-term roadmap, a vision for space 2047 in the Amrit Kaal. The Prime Minister was delighted with our presentation on future space missions," Somanath said.

Perhaps the most significant project ahead, however, is to establish an indigenous space station dubbed the Bharatiya Antariksha Station (BAS) which will orbit 400km above the Earth's surface. The 52-tonne behemoth space station will serve as a research platform for Indian astronauts and

scientists to conduct experiments in microgravity, astronomy and Earth observation, and will allow astronauts to stay in orbit for 15-20 days. The modular station will be assembled in space after getting launched in several stages starting 2028. The target to finish the entire project is for 2035, according to Isro.

Currently, there are only two operational space stations – the International Space Station (ISS), developed in cooperation by United States, Russia, Japan, Europe and Canada; and China’s Tiangong Space Station (TSS).

The station, Jitendra Singh said: “By 2035, there would be a Indian space station if everything goes well, as was announced by Prime Minister Narendra Modi... India has proved how space technology can be used in health, agriculture, climate, disaster management, smart cities, highway construction, or security of railway lines.”

The third project, development of the Next Generation Launch Vehicle, or NGLV, dubbed “Soorya” – a three-stage partially reusable rocket, being developed by Isro – will form the backbone of India’s future missions. Soorya, Isro has said, will be capable of carrying 10 tonnes of payload in geostationary orbit, and a payload of 30 tonnes in low-Earth orbit. It is expected to give a significant boost to India’s future missions, which will require heavier payloads than the current generations of rockets.

The fourth major project on Isro’s timeline is the expansion of the Gaganyaan mission (slated to kick off next year) to place the first Indian astronaut on the moon. The target for this project is 2040, according to Isro.

The newest addition to the agenda was the announcement of India’s plan to clear space.

“Now we are going to the next level, to reach out and clear the space debris. I am glad to share with the President, that this problem has also been addressed by India. We have set up one of the latest technologies in Bengaluru to detect and clear debris, and very soon, we will be also retrieving back the decommissioned satellites. The satellites that have accomplished their missions, will be returned to the Earth, and the world will learn this art from India,” said Jitendra Singh.

<https://www.hindustantimes.com/india-news/first-national-space-day-marks-chandrayaan-3-success-101724439897045.html>

# THE ECONOMIC TIMES

*Fri, 23 Aug 2024*

## **ISRO releases Chandrayaan-3 scientific data for global researchers**

The ISRO on Friday threw open its scientific data gathered from the Chandrayaan-3 mission for researchers across the world for analyses to mark the first anniversary of India landing a spacecraft on the Moon. The space agency has granted access to over 55 gigabytes of data from the five

payloads - three on the Vikram lander and two on the Pragyan rover - that created history on August 23 last year by making a soft landing near the unexplored south pole region of the Moon.

"This data is not going to be confined with those scientists who have created those instruments, but it will be made available to all the researchers of the country and the world for furthering the outcome of this," ISRO Chairman S Somanath said at the National Space Day celebrations here.

The Chandrayaan-3 data sets are available on Policy-based data Retrieval, Analytics, Dissemination and Notification System (PRADAN) portal of the Indian Space Science Data Centre (ISSDC) - [www.pradan.issdc.gov.in](http://www.pradan.issdc.gov.in).

The Pragyan rover conducted in-situ chemical analyses of the lunar surface, contributing to a better understanding of the Moon's origin and evolution. This information is crucial for future lunar exploration and potential resource utilisation.

Scientists from Ahmedabad's Physical Research Laboratory (PRL) after studying the data from Chandrayaan-3 provided evidence to confirm the Lunar Magma Ocean Hypothesis that the Moon evolved from a giant ocean of magma which later cooled down.

President Droupadi Murmu made it a point to laud the findings of India's space scientists which were published in science journal 'Nature' in her speech on the National Space Day. The president said ISRO had made remarkable achievements in the space sector as well as made invaluable contributions to the country's social and economic development.

<https://economictimes.indiatimes.com/news/science/isro-releases-chandrayaan-3-scientific-data-for-global-researchers/articleshow/112743030.cms>



*Mon, 26 Aug 2024*

## **Nuclear-powered rockets a revolution in spaceflight**

A revolution in spaceflight is on as aerospace scientists prepare to test the first-ever nuclear rocket engine in space. Reports speak of major advances in a nuclear thermal propulsion (NTP) project jointly developed by the US Defense Advanced Research Projects Agency (DARPA) and aerospace giant Lockheed Martin. Called Demonstration Rocket for Agile Cislunar Operations (DRACO), the spacecraft's original launch date — scheduled for 2027 — has now been advanced to 2025 or early 2026.

After launching on a conventional rocket, DRACO's nuclear engine will be switched on after it reaches a 2,000 km high orbit around Earth — a perch from where it will take more than 300 years for DRACO to fall back to Earth, after safely exhausting its nuclear fuel. DRACO's revised launch date has to do with NASA joining the project last year, and it wants to use NTP for its upcoming Moon and Mars missions. Space engineers have long depended on chemical propulsion to power rockets.

A mixture of fuel (comprising propellants like hydrogen) and liquid oxygen is ignited so that the expanding gas is ejected from the rocket, generating thrust. But chemical engines have a major downside when the fuel and oxidizer react and their chemical bonds get rearranged, the reaction releases only a limited amount of energy. Since the rocket's power is limited to the amount of propellants it carries, this limits the thrust-to-weight ratio it can achieve for lifting payloads into orbit. This translates into huge costs every time a rocket launches a satellite or spacecraft into orbit.

With chemical rockets and spacecraft driven by electric or solar-powered engines drawing closer to their limits of performance, nuclear propulsion has emerged as a viable alternative. Space engineers are developing two types of nuclear reactors to power rockets: NTP and radioisotope thermoelectric generators (RTGs).

RTGs do not provide propulsion, they merely generate nuclear electricity by harnessing the heat of radioactive decay. But this provides extremely low thrust making RTGs useful only for manoeuvring a spacecraft after launch.

Famed interplanetary missions like Apollo, Pioneer, Voyager, and Cassini all had RTGs as their power source. In contrast, NTP is similar to chemical propulsion, the only difference being its use of nuclear fission (the process of splitting atoms) to produce an incredible amount of energy to propel the rocket.

A rocket driven by NTP carries a small fission reactor that creates tremendous heat to ignite the propellant gas, which is then let off explosively through a nozzle to create thrust. With nearly five times the propellant efficiency of chemical rockets, NTP can help astronauts reach, say, Mars in just 45 days instead of seven months on conventional rockets.

This substantial cut in travel time also protects the astronauts from prolonged exposure to cosmic radiation and microgravity — a clear and present danger in outer space. Unlike nuclear-powered spacecraft whose fuel lasts interminably long, solar, and chemical systems simply do not have the fuel capacity or energy to operate in deep space. The idea of nuclear-powered rockets is hardly new.

Way back in the late 1940s, the US Air Force (USAF) began designing fission reactors for intercontinental ballistic missiles under its Project Rover. In 1959, NASA joined the project and, after elbowing out the USAF, changed the project's goal to developing a nuclear rocket for space exploration.

This led to the first atomic rocket engine: the 300-megawatt Kiwi-A. NASA, with the intention of launching a manned Mars mission aboard a nuclear-powered spacecraft by 1979, started the project's next phase, the Nuclear Engine for Rocket Vehicle Application (NERVA). As it happened, however, after a flyable nuclear thermal engine was built in the late 1960s, NERVA was scrapped to make room for the Space Shuttle.

History need not repeat itself, and it is unlikely that the US military would let NASA 'hijack' the DRACO project, as had happened with Project Rover in 1959. DRACO was probably speeded up to help the US reestablish its leadership role in space that is contested by players such as China and Russia.



Today, several spacefaring countries have their own nuclear propulsion programmes. Chinese engineers have designed a mini ‘foldable’ reactor; on reaching orbit, it unfolds to power the spaceship.

The Russians did develop a 500-kilowatt nuclear engine for Zeus, a spacecraft for carrying heavy cargo in space; but have now replaced it with another less powerful engine developed for the SinoRussian International Lunar Research Station. The European Space Agency is making an atomic power plant, RocketRoll, whose prototype is expected by the end of the decade.

The Indian Space Research Organisation (ISRO) has a nuclear rocket programme expressly meant for launching satellites. Last year, the first stage of an atomic-powered engine — a radioisotope heating unit — was successfully tested on India’s lunar mission, Chandrayaan-3.

It provides power to the propulsion module which is still in orbit around the Moon. ISRO sources say the agency is collaborating with the Bhabha Atomic Research Centre to build a 100-watt RTG. Addressing safety concerns about the risks associated with nuclear-powered rockets — from the potential for launch accidents to the disposal of radioactive waste — is as challenging as the technology itself. Therefore, the next big leap for spaceflight depends on how well scientists negotiate this slippery slope.

<https://www.deccanherald.com/opinion/nuclear-powered-rockets-a-revolution-in-spaceflight-3164282>



*Mon, 26 Aug 2024*

## **Space-tech to improve logistics and supply chain management in indian scenario**

Logistics and supply chain management are crucial foundations of the Indian economy, guaranteeing the effective movement of products, services, and individuals throughout the nation. The Indian government has effectively reduced the logistics GDP from 14% to around 7.8% to 8.9% through the implementation of programs such as Bharat Mala, Sagarmala, and PM Gati Shakti schemes.

The recent triumph of Chandrayan-3 holds the potential to greatly augment the capabilities of Indian space technology. The successful mission has enhanced the existing capabilities of space technology, such as satellite navigation systems, remote sensing, satellite communication, and web geographic information systems (GIS).

The Global Positioning System (GPS) is a satellite-based radio navigation system used to communicate worldwide geographic location data. The Indian Regional Navigation Satellite System (IRNSS) has created its own regional satellite navigation system called NavIC (Navigation with Indian Constellation). NavIC is designed to offer accurate location data for both domestic and

regional purposes. The constellation of seven satellites provides dependable positioning services not just within India but also to a substantial area spanning 1500 km outside its borders.

GPS technology can be used to trace recent wars between global countries or state boundaries that involve rivers, mountain ranges, and oceans. Surveyors employ the accuracy of absolute positions to create maps and establish property borders.

It is possible to determine the optimal locations for facilities, allocate resources, establish warehouses, and identify suitable sites for multi-modal logistic parks and special economic zones. Telematics is a technology that combines GPS technology with computers and mobile communications networks to provide improved automobile navigation systems.

The Wide Area Augmentation System (WAAS) can be utilized to monitor the movement of vessels and containers, providing information on their velocity, speed, direction, and position. This technology will significantly benefit the port and logistics industries. The subject of focus for worldwide governments in recent years is intelligent transportation systems for urban traffic management. The extensive utilization of GPS technology in automobiles presents a tremendous prospect to transform traffic management. Thousands of vehicles are sending real-time data from urban roads, including latitude, longitude, speed, and other pertinent metrics.

The dynamic information can be utilized to facilitate various research and applications in Intelligent Transportation Systems, resulting in improved traffic flow, reduced congestion, and strengthened safety procedures. Satellite-derived data can be used to exchange information between airport planners and managers and their counterparts at other agencies to expedite infrastructure development and urban planning activities in their respective regions. Remote sensing can be applied to evaluate the impact of landscape patterns, land use types, and increasing urban temperatures on urban thermal environments.

This technology can assist army and police departments in tracking and tracing activities. Incorporate Unmanned Aerial Vehicles (UAVs) into satellite systems for operations that go beyond the visual line of sight (BVLOS), such as covering terrestrial range and providing assistance in areas affected by natural disasters or prone to interruptions. Space Internet is a telecommunications service that utilizes satellites positioned in geostationary orbit, namely at a height of 35,786 kilometers above the Earth's surface.

Unlike the constraints imposed by fiber-optic cables or wireless networks, these satellites in space possess the capacity to surmount obstacles. Developed nations are utilizing space-based internet to acquire airborne laser scanning (ALS) data for the purpose of reconstructing railway overhead lines, hence providing reliable and secure transportation services.

The implementation of satellite-based internet is essential for providing connectivity to remote places characterized by difficult topography, such as the Himalayas and isolated regions in the north-east. The integration of space technology into logistics and supply chain management offers India a pathway to achieving its vision of Atmanirbhar Bharat.

By leveraging advancements in satellite navigation, remote sensing, satellite communication, and space internet, India can increase the efficiency, reliability, and resilience of its logistics networks. Space technology, including satellite communication, GPS and remote sensing, revolutionizes

logistics by enhancing real-time tracking, optimizing routes, forecasting the weather to mitigate risks, and improving inventory management. Additionally, space tech enables global communication networks for seamless coordination and facilitates advanced geospatial analysis for supply chain management, enhancing adeptness and reducing costs across industries.

<https://www.dailypioneer.com/2024/columnists/space-tech-to-improve-logistics-and-supply-chain-management-in-indian-scenario.html>

