

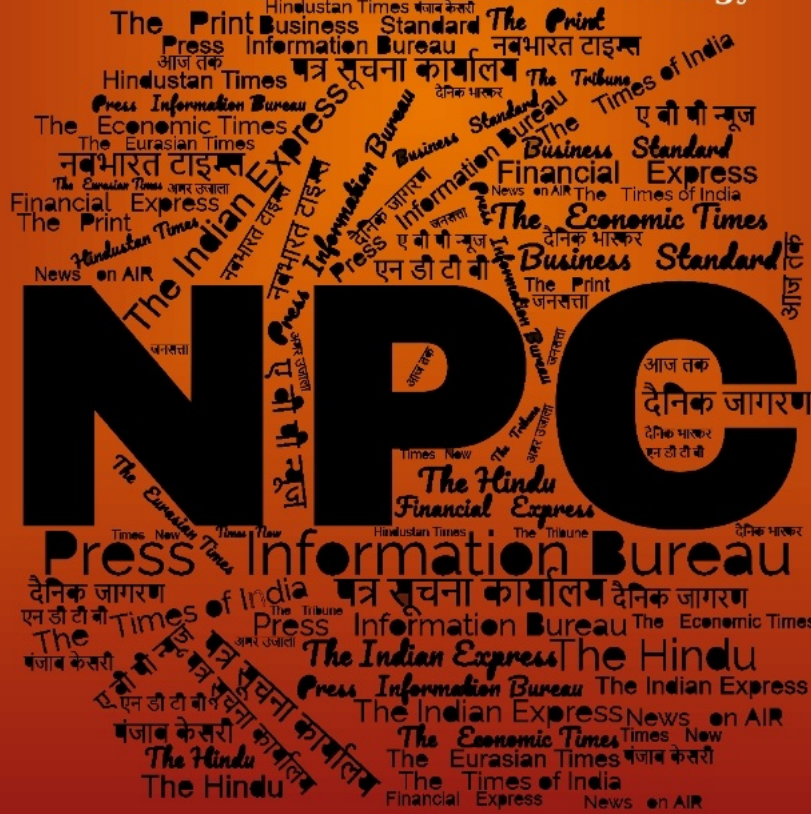
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Defence News

Defence Strategic: National/International

Army Hospital (R&R) performs India's first-ever Left Ventricular Assist Device implantation using HeartMate 3 device in a government institution

Source: Press Information Bureau, Dt. 22 Jan 2025,

URL: <https://pib.gov.in/PressReleasePage.aspx?PRID=2095207>

Army Hospital (Research & Referral), Delhi Cantt has performed India's first-ever Left Ventricular Assist Device (LVAD) implantation using the HeartMate 3 device in a government institution. This marks a historic first for the Armed Forces Medical Services too. The procedure was successfully performed on a 49-year-old wife of an Armed Forces veteran who had been waiting for a heart transplant for over two years. The LVAD, often regarded as a 'mechanical heart', serves as a life-saving bridge for patients with end-stage heart failure.

The HeartMate 3 LVAD is a cutting-edge device that uses advanced technology to improve heart function. It offers hope to patients with severe cardiac conditions. Currently, the patient is recovering steadily under medical supervision, showcasing the success of high-quality team work.

This achievement reflects the Army Hospital's relentless pursuit of excellence in medical care. This milestone reaffirms the position of Army Hospital (R&R) as a leader in providing advanced medical care.

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In a first, a Tri-Services tableau to take part in Republic Day Parade 2025 with the theme 'Shashakt aur Surakshit Bharat'

Source: Press Information Bureau, Dt. 22 Jan 2025,

URL: <https://pib.gov.in/PressReleasePage.aspx?PRID=2095130>

Displaying the spirit of jointness and integration, a Tri-services tableau will roll down Kartavya Path for the first time during the 76th Republic Day Parade on January 26, 2025. With the theme '*Shashakt aur Surakshit Bharat*', the tableau will showcase the conceptual outlook for jointness and integration in the Armed Forces, ensuring national security and operational excellence.

The tableau would depict a Joint Operations Room facilitating networking and communication among the three Services. It would display a battlefield scenario demonstrating a synchronised

operation in land, water and air with the indigenous Arjun Main Battle Tank, Tejas MKII fighter aircraft, Advanced Light Helicopter, destroyer INS Visakhapatnam & a Remotely Piloted Aircraft, reflecting the Tri-services synergy in multi-domain operations. These platforms exemplify the vision to achieve 'Aatmanirbharta' in defence.

2025 has been declared as the 'Year of Reforms' in the Ministry of Defence. Jointness and Integration is at the core of the mandate allocated to the Department of Military Affairs. These are identified as the key building blocks towards maximising combat potential of the Armed Forces in both, contemporary and future conflicts. Headquarters, Integrated Defence Staff has taken focused actions towards Tri-services synergy to steer the reforms in the right direction.

This evolution towards jointness and integration, driven by the synergy between the three Services, will significantly enhance the country's military capabilities by fostering a culture of shared responsibility and unified action in safeguarding national interests.

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Ministry of Defence moves ahead with submarine plan, MDL qualifies for next round

Source: The Economic Times, Dt. 22 Jan 2025,

URL: <https://economictimes.indiatimes.com/news/defence/ministry-of-defence-moves-ahead-with-submarine-plan-mdl-qualifies-for-next-round/articleshow/117465649.cms>

The defence ministry has moved ahead with a multi-billion dollar plan to construct next-generation conventional submarines in India, with Mazagaon Dockyards Limited (MDL) qualifying after technical trials and moving to the next stage of techno-commercial negotiations.

Sources said the bid by MDL in partnership with Germany's Thyssenkrupp Marine Systems (TKMS) has been given the go ahead by a technical oversight committee that looked into the bidding process and trials carried out last year.

As reported earlier, the Navy had conveyed some shortcomings in the latter offering after a round of trials that pertained to the requirement of a sea proven air independent propulsion system. As per the procurement process, the next stage will be to open the commercial bids that had been submitted by MDL. After going through the offer, detailed discussions on technical aspects and commercial terms will be carried out before the estimated ₹43,000 crore proposal will be moved for approvals to the competent authorities.

Given the enormity of the project-six submarines have to be built in India with a high degree of technology transfer-the first of the new boats is expected to enter service almost seven years after signing of a contract. A key capability the new submarines will bring is the AIP system that will give the boats the ability to stay underwater for up to two weeks, greatly enhancing stealth.

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Army builds two bailey bridges to connect Shyok, Nubra valleys in Ladakh

Source: The Economic Times, Dt. 22 Jan 2025,

URL: <https://economictimes.indiatimes.com/news/defence/army-builds-two-bailey-bridges-to-connect-shyok-nubra-valleys-in-ladakh/articleshow/117460602.cms?from=mdr>

The Indian Army on Wednesday inaugurated two newly constructed bailey bridges over the Shyok River, enhancing connectivity between the Shyok and Nubra valleys in the Union Territory of Ladakh. The bridges, located near Shatse Taknak in the Diskit sub-division of Leh, were inaugurated by Brigadier V S Salaria, Commander of the Siachen Brigade, Brigadier V S Salaria and Deputy Chairman of the Ladakh Autonomous Hill Development Council (LAHDC), said defense spokesperson Tsering Angchuk.

Constructed by the Fire and Fury Corps Engineers, the two bridges -- 50 feet wide and 100 feet in length -- reduce travel distance by approximately 40 km and cut travel time by around two hours for the farthest villages in Nubra and Shyok valleys, he said.

The inauguration ceremony was attended by dignitaries, including military personnel, Nubra Sub Divisional Magistrate Mukul Beniwal and community members from Charasa, Burma, Kuri, and Murgi villages.

These bridges are a significant boon to the local population, particularly during the harsh winter months, improving accessibility to essential services and fostering better connectivity for the villages in the Siachen region, he said.

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Can India's Defence Budget 2025 bridge global ambitions and domestic realities?

Source: The Economic Times, Dt. 23 Jan 2025,

URL: <https://economictimes.indiatimes.com/news/defence/defence-budget-can-india-defence-budget-2025-bridge-global-ambitions-and-domestic-realities-challenges-self-reliance-strategic-partnership-modernization/articleshow/117460197.cms>

India's defence spending for the financial year 2025-26 is expected to stabilise around 1.9 to 2 per cent of GDP, consistent with recent years. While this offers financial stability, it may not be enough to counter escalating external threats. At the 21st Subroto Mukerjee Seminar, Defence Secretary Rajesh Kumar Singh highlighted the importance of prioritising resource allocation rather than increasing funds, noting that the current budget already stretches the absorptive capacity of domestic industries.

Geopolitical strategist and FACE founder Velina Tchakarova remarked, "India's defence budget at 2.4% of GDP (approximately \$72.6 billion) positions it as the fourth-largest military spender globally, but its absolute spending significantly trails behind the U.S. (\$916 billion), China (\$296

billion), and the newly planned Russian defence budget for 2025 (\$126 billion). This gap partially restricts India's ability to project power both regionally and globally, as sustained investments in advanced technologies, naval capabilities, and air power are critical for power projection. For instance, China's rapid military expansion, including its robust naval fleet and artificial intelligence-based warfare systems, allows it to exert dominance in the Indo-Pacific—a region where India also seeks influence.”

Tchakarova added, “India's plans, such as acquiring 114 multirole fighter jets and strengthening its naval capabilities with indigenous aircraft carriers like INS Vikrant, highlight its intent to enhance strategic reach, but budget constraints slow this progress.”

Defence Budget 2025: Challenges in effective budget utilisation

India's defence spending as a share of the total budget has been declining steadily. From 16 per cent in 2013, it peaked at 18 per cent in 2016-17 but is projected to drop to 13 per cent by 2025 - the lowest since the 1960s. While this indicates fiscal prudence, it strains the country's ability to counter external threats effectively.

In FY25, only 27.66 per cent of the defence budget has been allocated to capital expenditure. Dr Amit Singh, Assistant Professor at Jawaharlal Nehru University, observed that if all salaries and pensions had not been absorbed into revenue expenditure, more funds could have been allocated for modernisation. This places additional strain on finances while attempting to provide the most modern technologies for the armed forces. “If personnel costs were contained, more funds could be directed toward acquiring cutting-edge technologies,” he explained.

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India, France step up maritime security cooperation in Indian Ocean Region

Source: The Economic Times, Dt. 22 Jan 2025,

URL: <https://economictimes.indiatimes.com/news/defence/india-france-step-up-maritime-security-cooperation-in-indian-ocean-region/articleshow/117436664.cms>

India and France are deepening maritime cooperation to achieve a peaceful and secure Indian Ocean Region with New Delhi assuming chair of the Indian Ocean Rim Association (IORA) in 2025 for two years.

India and France at their recently-held Maritime Cooperation Dialogue in New Delhi agreed to develop a joint assessment of threats to maritime security in the IOR for countering illicit maritime activity, including piracy and armed robbery, maritime terrorism, contraband smuggling, illegal unreported and unregulated fishing; hybrid as well as cyber security threats and marine pollution, said officials familiar with the issue. New Delhi and Paris also agreed to support free and secure access to sea lanes of communications through collaboration between their maritime assets and organisations, the officials said. France, which has territories in the IOR, is one of India's principal partners in the region.

Meanwhile, Foreign Secretary Vikram Misri who is in Paris met Secretary-General of the French Ministry for Europe and Foreign Affairs Anne-Marie Descotes to prepare for Prime Minister Narendra Modi's visit to France in February for the AI Summit.

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India about to sell Russia-backed BrahMos cruise missiles

Source: The Economic Times, Dt. 22 Jan 2025,

URL: <https://economictimes.indiatimes.com/news/defence/india-about-to-sell-russia-backed-brahmos-cruise-missiles/articleshow/117443364.cms>

India is considering a \$450 million deal to sell Russian-backed supersonic cruise missiles to Indonesia as the Southeast Asian country looks to bolster defenses, according to people familiar with the matter.

The sale of the BrahMos cruise missiles is expected to be announced as early as this week when Indonesian President Prabowo Subianto officially visits India, the people said, asking not be identified as discussions are private. Prabowo is set to attend the Republic Day celebrations as a special guest on Sunday.

A key hurdle for Indonesia is securing financing for the missile purchases given the nation's budget constraints, one of the people said. Funding is still being discussed with India and it's unclear when a deal can be finalized for the missiles, which have a firing range of at least 380 kilometers (186 miles).

If the sale goes through, Indonesia would be the second country after the Philippines to acquire the anti-ship cruise missiles. Southeast Asian nations are modernizing and bolstering their militaries as the South China Sea remains a flashpoint with an assertive China and President Donald Trump back in the White House.

India and Indonesia have been negotiating for about a decade for the sale of the BrahMos cruise missile, jointly developed by India and Russia. Rosoboronexport, Russia's state owned military hardware supplier, is part of the negotiations, the people said.

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India, US push for swift closure of GE-414 fighter jet engine pact, eyes March deadline

Source: The Economic Times, Dt. 22 Jan 2025,

URL: <https://economictimes.indiatimes.com/news/defence/india-us-push-for-swift-closure-of-ge-414-fighter-jet-engine-pact-eyes-march-deadline/articleshow/117457512.cms>

A team from HAL is scheduled to visit the United States in the coming weeks to hold discussions with General Electric (GE) on the GE-414 engine deal. Defence officials have confirmed that the team will engage in detailed negotiations covering all aspects of the programme and work towards signing the deal by March.

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The current negotiations involve the procurement of 99 engines, with potential expansion if the engine is selected for India's fifth-generation aircraft programme. "The level of transfer of technology promised by GE Aerospace is very high, and it will certainly help in boosting the capabilities of the country in this field," defence officials told ANI.

According to IDRW, GE has reportedly sought an additional \$50 million for the agreement, which increases the scope of Transfer of Technology (ToT) by 22% compared to the 2012 deal. The overall cost of the deal is estimated at around \$1 billion at 2023 price levels. HAL has established a Contract Negotiation Committee (CNC) to oversee the discussions and has requested specific technical documents from GE to assess the proposed ToT.

Challenges in Jet Engine Supply

India has faced challenges due to delays in jet engine supply for its Light Combat Aircraft (LCA) Mark 1A and Mark 2 programmes. The delivery of GE-404 engines for the LCA Mark 1A fleet has been affected by global supply chain disruptions. Officials stated that delays in signing the GE-414 project could impact the induction of the LCA Mark 2, which is designed as a 4.5-generation aircraft to replace Mirage-2000, Jaguar, and MiG-29 fighter jets in the Indian Air Force.

Technological Advancement and Self-Reliance Efforts

India is working towards achieving self-reliance in jet engine manufacturing by collaborating with global manufacturers. "India has now started working to develop an engine of its own and may be aligning with a global manufacturer soon in this regard," sources told India Today TV. The proposed ToT from GE is expected to significantly enhance India's indigenous capabilities in jet engine production.

Global Jet Engine Market and India's Position

Currently, only a few countries, such as the US, France, the UK, and Russia, possess the capability to manufacture jet engines. Most fighter aircraft worldwide rely on engines from American, Russian, or European manufacturers. India aims to reduce dependency on foreign suppliers through strategic partnerships and technology acquisition.

Financial and Market Impact

Despite ongoing negotiations, HAL shares traded 0.85% lower at ₹4,151.80 on Tuesday. The stock has remained flat on a year-to-date basis. Market analysts are closely watching the progress of the deal, given its potential impact on HAL's financial performance and India's defence sector. The finalisation of the GE-414 engine deal is critical for India's defence modernisation plans. Successful completion by March will be key to ensuring timely production of indigenous fighter aircraft and enhancing national security capabilities.

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Indian Army Flexes Firepower with K-9 Vajra, Dhanush, and Pinaka at Exercise TOPCHI

Source: Republic World, Dt. 22 Jan 2025,

URL: <https://www.republicworld.com/defence/indian-armed-forces/indian-army-flexes-firepower-with-k-9-vajra-dhanush-and-pinaka-at-exercise-topchi>

The Indian Army successfully conducted its annual firepower demonstration, Exercise TOPCHI, at the Devlali Field Firing Ranges in Nashik, Maharashtra. Organized by the Regiment of Artillery, the exercise highlighted the Army's commitment to operational readiness, technological advancement, and the Aatmanirbhar Bharat (Self-Reliant India) initiative.

Cutting-Edge Arsenal on Display

Exercise TOPCHI featured a live demonstration of advanced artillery systems and surveillance technologies, showcasing the Indian Army's formidable firepower and precision capabilities. The event displayed a range of sophisticated weaponry, including:

- K-9 Vajra: A self-propelled gun system designed for rapid deployment, offering high mobility and precision artillery support.
- 155mm M777 Ultra-Light Howitzer: Noted for its mobility and high-altitude deployment capabilities, enhancing India's firepower in mountainous terrains.
- 155mm Dhanush: An indigenous upgrade of the Bofors gun, reflecting India's advancements in domestic defence manufacturing.
- 155mm FH 77B02 (Bofors): A battle-proven artillery piece that remains a crucial part of India's arsenal.

In addition to artillery guns, the exercise featured cutting-edge rocket systems such as the Pinaka and Smerch, capable of delivering devastating firepower over long ranges. The event also highlighted advancements in unmanned aerial platforms, showcasing swarm drones, loitering munitions, and reconnaissance drones, demonstrating the Army's evolving capabilities in network-centric warfare.

Aatmanirbhar Bharat in Focus

Exercise TOPCHI prominently featured indigenous defence technologies, underscoring India's drive towards self-reliance in defence production. The inclusion of homegrown systems such as the Dhanush artillery gun and the Pinaka rocket launcher highlighted the success of Make in India initiatives aimed at reducing dependence on imports and enhancing domestic production capabilities.

Lieutenant General Navneet Singh Sarna, Commandant of the School of Artillery, emphasized the significance of integrating indigenous technologies, stating, "Our focus remains on achieving self-reliance and developing a robust indigenous defence manufacturing ecosystem. Exercise TOPCHI demonstrates our commitment to operational readiness while showcasing our technological advancements."

Strategic and Operational Significance

The exercise served as a crucial platform to validate the Indian Army's ability to integrate a diverse range of weapon systems into a cohesive operational framework. This capability is critical to

ensuring swift and effective responses across a variety of operational scenarios, from conventional warfare to counter-insurgency operations.

Given the evolving security landscape and regional challenges, such exercises are vital in reinforcing India's preparedness to counter potential threats along its borders. The live demonstration of precision targeting, quick mobility, and high-volume firepower exhibited the Army's readiness to tackle modern battlefield challenges.

Distinguished Attendees and International Presence

The event was attended by a distinguished audience, including student officers from premier military institutions such as the Defence Services Staff College (Wellington) and the Defence Services Technical Staff Course (Pune). International representation was also present, with officers from the Nepal Army Staff Course attending the event as part of defence cooperation initiatives.

Senior dignitaries from the Armed Forces, cadets from military training academies, and members of the civil administration were also in attendance, highlighting the significance of the exercise in shaping future defence policies and capabilities.

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Amid US fears of PLAN outnumbering its Navy, Chinese Navy adds another new-generation frigate to its fleet

Source: The Week, Dt. 22 Jan 2025,

URL: <https://www.theweek.in/news/defence/2025/01/22/amid-us-fears-of-plan-outnumbering-its-navy-chinese-navy-adds-another-new-generation-frigate-to-its-fleet.html>

Amid rising defence competition with the US and other regional powers, the People's Liberation Army Navy (PLAN) has commissioned a new-generation frigate. According to the Chinese Navy, this will play a major role in the overall combat effectiveness of its forces.

The first Type 054B frigate, named Luohe, was commissioned Wednesday in Qingdao, a port city in northern China where the PLAN's northern fleet is based. The ship—armed with a variety of machine guns for close combat and anti-air and anti-ship missiles—has a displacement of approximately 5,000 tonnes and includes stealth technology, combat command systems and firepower integration, significantly enhancing overall performance, according to PLAN.

With strong capabilities for comprehensive combat operations and diverse military missions, the warship will play a vital role in enhancing the overall combat effectiveness of naval task forces of China.

China already has the world's largest navy in terms of number of hulls. Its largest competitor, the US, has warned its Navy could be outnumbered and has called for a building programme as well as reforms to put damaged ships into action sooner.

China has around 234 warships compared to the US Navy's 219, including around 50 frigates and the same number of destroyers. China has two operating aircraft carriers and another undergoing sea trials, along with a massive and powerful coast guard.

PLAN operates mainly in waters off the Chinese east coast and in the strategically crucial South China Sea, which China claims almost in its entirety.

A key mission also remains backing up the army in any attack on Taiwan, the self-governing island democracy about 160 kilometers off the Chinese coast that Beijing has vowed to annex by force if necessary.

According to some defense publications, the ship could become the backbone of the Chinese navy.

The PLAN has also sent ships further abroad, including the Mediterranean Sea and the Caribbean, in its attempts to use its navy as an extension of its growing economic and diplomatic clout. PLAN and Chinese coast guard ships have also patrolled in the East China Sea, where China claims a group of uninhabited islands controlled by Japan.

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Quad Foreign Ministers signal firm stand against China's aggression at sea

Source: The Tribune, Dt. 23 Jan 2025,

URL: <https://www.tribuneindia.com/news/india/quad-foreign-ministers-signal-firm-stand-against-chinas-aggression-at-sea/>

In a veiled message to China on its attempts to coerce its way through maritime territorial disputes, the Foreign Ministers of the Quad countries 'strongly opposed' attempts to change any status quo and said the four countries — India, the US, Japan and Australia — would maintain conviction for upholding international law.

The Quad Foreign Ministers met at Washington DC on Tuesday, a day after Donald Trump took over as the US President, making the Quad Foreign Ministers meet the first significant foreign policy event of the new US administration. Details of the meeting emerged in the wee hours of Wednesday.

A joint statement outlined the Quad's plans for progress, emphasising the shared commitment of the four nations. "We remain convinced that international law, economic opportunity and peace, stability and security across all domains, including the maritime domain, are essential to the development and prosperity of the Indo-Pacific's people," it said.

In an obvious unstated reference to China, the statement said, "We strongly oppose any unilateral actions that seek to change the status quo by force or coercion. We reaffirm our shared commitment to strengthening a free and open Indo-Pacific where the rule of law, democratic values, sovereignty and territorial integrity are upheld and defended."

These blunt messages from the Quad Foreign Ministers to China come as Beijing continues to employ coercive tactics at sea, primarily in the South China Sea, to assert territorial claims and shape regional dynamics. These include operations by a 'maritime militia' to intimidate and harass other countries' fishing boats and coast guard vessels within disputed waters.

The Chinese Coast Guard has been involved in aggressive manoeuvres, including ramming and water cannon attacks, against vessels from other countries. China claims vast swathes of the South China Sea, overlapping with the exclusive economic zones of several other countries. A code of conduct is being discussed among six countries — the Philippines, China, Taiwan, Vietnam, Malaysia and Brunei — that are party to the maritime boundary dispute in the South China Sea. These countries have been discussing a code of conduct forced upon the claimants by China that did not accept a UN verdict on the demarcation of the maritime boundary.

Meanwhile, in Washington DC, the Quad Foreign Ministers said they were committed to strengthening regional maritime, economic and technology security in the face of increasing threats, as well as promoting reliable and resilient supply chains.

“We look forward to advancing the work of the Quad in the coming months and will meet on a regular basis as we prepare for the next Quad summit hosted by India,” the statement said.

The Quad Foreign Ministers’ meet was the first for the US Secretary of State, Marco Rubio. External Affairs Minister S Jaishankar, Australian Foreign Minister Penny Wong and Japanese Foreign Minister Iwaya Takeshi attended the meeting.

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US Secretary of State Rubio meets EAM Jaishankar, discusses strategic cooperation

Source: ANI News Dt. 22 Jan 2025,

URL: <https://www.aninews.in/news/world/us/us-secretary-of-state-rubio-meets-eam-jaishankar-discusses-strategic-cooperation20250122083541/>

Secretary of State Marco Rubio met with Indian External Affairs Minister Subrahmanyam Jaishankar in Washington, DC, reaffirming the shared commitment to strengthening the US-India partnership, an official press release by the US Department of State said.

Secretary Rubio and External Affairs Minister Jaishankar affirmed a shared commitment to continuing to strengthen the partnership between the United States and India. They discussed a wide range of topics, including regional issues and opportunities to further deepen the U.S.-India relationship. Secretary Rubio also emphasized the Trump Administration's desire to work with India to advance economic ties and address concerns related to irregular migration.

This meeting marked Secretary Rubio's first bilateral engagement since assuming office. Both leaders emphasised collaboration in areas such as critical and emerging technologies, defence, energy, and the advancement of a free and open Indo-Pacific region.

External Affairs Minister Jaishankar expressed optimism about the bilateral relationship in a statement on X (formerly Twitter). He noted, "Delighted to meet Secretary Marco Rubio for his first bilateral meeting after assumption of office as Secretary of State. Reviewed our extensive bilateral partnership, of which Secretary Marco Rubio has been a strong advocate. Also exchanged views on a wide range of regional and global issues. Look forward to closely working with him to advance our strategic cooperation."

The US-India relationship has seen substantial growth in recent years, with a focus on defence collaboration, trade, and shared strategic goals in the Indo-Pacific region. Secretary Rubio emphasised the importance of critical and emerging technologies as a key area for partnership, reflecting both nations' interests in fostering innovation and enhancing security frameworks.

The Indian American community, numbering approximately 4.4 million, plays a pivotal role in strengthening ties between India and the United States. With 3.18 million persons of Indian origin constituting the third-largest Asian ethnic group in the US, this community excels across diverse fields, including politics.

Their contributions have been instrumental in fostering closer bilateral relations. Notably, five individuals of Indian origin currently serve in the US Congress, further highlighting their influence and integration into American society.

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Tejas takes flight, but will the US let it soar

Source: The Tribune, Dt. 23 Jan 2025,

URL: <https://www.tribuneindia.com/news/comment/tejas-takes-flight-but-will-the-us-let-it-soar/>

India's indigenous light combat aircraft (LCA) Tejas was envisioned as a cutting-edge multirole fighter to replace the Indian Air Force's large fleet of Soviet legacy platforms, including the MiG series of fighters. These old workhorses, such as the MiG 21, MiG 23, and MiG 27, have rendered their fair share of yeoman service to the nation since their induction in the 1960s and 70s and proved pivotal in operations executed by the IAF. However, as the new millennium approached, these machines began showing signs of obsolescence and were marred with maintenance issues.

These factors, compounded by the lack of quality spares from the splintered Soviet Union, eventually led to hundreds of crashes and mishaps. The most ill-famed was the MiG 21, which earned the infamous moniker of the 'Flying Coffin', owing to its record of over 400 crashes and more than 200 pilots killed during its six-decade service.

The Tejas was a product of the light combat aircraft programme, started in 1983 jointly by the Aeronautical Development Agency (ADA), the Defence Research and Development Organisation (DRDO) and Hindustan Aeronautics Limited (HAL).

The first test flight was conducted on January 4, 2001, and the aircraft gained its final operational clearance (FOC) on February 20, 2019 during the Aero India airshow. A significant milestone was the development of the Tejas MK 1A variant, which incorporates advanced radars, enhanced weapons capability and improved operational range, thanks to a better engine.

The jet engine selected for the aircraft is the General Electric F404, being sourced from the US. The agreement for supply was arrived at during Prime Minister Narendra Modi's visit to the US in the summer of 2023.

However, the delayed supply of this very engine has brought the IAF's induction schedule to a standstill since the first engines slated for delivery in 2023-end are now expected around April 2025.

The manufacturer, General Electric (GE), has attributed this roughly one-and-a-half-year delay to supply chain issues from a Korean partner. This hold-up has adversely impacted the IAF's operational preparedness, compelling the Indian Ministry of Defence to levy penalties on GE.

It remains to be seen if this delay is really a supply chain issue or something far more calculated and deliberate. The US is well known for its focus on technology denial to ensure and maintain its own leading position amongst the comity of nations.

The Government of India's emphasis on the Make-in-India Mission and defence exports to friendly, like-minded nations has resulted in a leap in India's defence development and production capacity.

The Tejas has been aggressively marketed at various international air shows, validating its performance and capabilities to the world. Furthermore, the Tejas is now seen as a capable, cost-effective, multi-role, 4.5 Generation fighter by many prospective nations seeking to replace their older fighter aircraft.

It is this very challenge to the dominance of American fighter aircraft, such as the F-16, in the international market that makes the engine delays in the Tejas programme seem more suspicious.

In the past few years, the US has pitched Lockheed Martin F-16s to multiple countries looking to purchase fighters. In the case of Argentina, the F-16 won the contract, competing with the Tejas and the Chinese JF-17. Some see these attempts by the US as a means to counter the growing challenge posed by China and other possible contenders.

Though the Tejas has an overall edge compared to the JF-17 and matches the F-16's capability while being comparatively cheaper, the lack of a foreign customer so far has led many defence lobbyists to cast doubts on the Tejas programme.

These attempts to deter nations from inducting the aircraft, compounded by the delays of the GE F404 engines, could further harm the Tejas programme's image. This development also minimises competition to the US Military Industrial Complex and ensures its continued hegemony in global defence markets.

The US repeatedly resorts to the use of technology denial as a means to exercise its will and preserve its interests in the world. India is one of the nations affected by such policies in the past.

The US efforts at ensuring that India remained a 'nuclear pariah' after its 1974 peaceful nuclear explosion are well known to the world and remain fresh in Indian minds.

Even though the Indo-US nuclear deal of 2008 during the Bush presidency was aimed at recognising India as a responsible nuclear state, with which others could enter into nuclear trade and although Indo-US ties have come a long way since then, we cannot forget that there were plenty of naysayers to the Bush administration's carve-out for India in the nuclear field.

Are these naysayers back at work when the transfer of jet engine technology is round the corner?

Even though the Government of India and the US administration have over the recent decades worked hard at building trust and confidence in each other, there may be some other mavericks at work.

We do hope this subject was clarified during US National Security Adviser Sullivan's recent visit to New Delhi.

While the supply of the GE F404 engines will take place sooner rather than later, the entire question of the transfer of jet technology will rest in nimble, persistent and solid diplomacy by both India and the US. If successful, India's ties with the US will strengthen immeasurably.

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India joins €7.1 bn Eurodrone as observer. Here's what 4-nation programme is all about

Source: The Print, Dt. 22 Jan 2025,

URL: <https://theprint.in/defence/india-joins-e7-1-bn-eurodrone-as-observer-heres-what-4-nation-programme-is-all-about/2457345/>

India has, as an observer state, officially joined the Medium Altitude Long Endurance Remotely Piloted Aircraft System (MALE RPAS) or Eurodrone programme, managed by the Bonn-based Organisation for Joint Armament Cooperation (OCCAR) and led by Taufkirchen-based aerospace company Airbus Defence and Space.

A formal request to join the programme was made in August 2024, with acceptance coming just days before Aero India 2025 in Bangalore, Asia's largest military aviation exhibition.

Eurodrone is a four-nation initiative involving Germany, France, Italy, and Spain. The programme, led by Airbus Defence and Space (Germany), includes Leonardo (Italy), Dassault Aviation (France), and Airbus (Spain) as major subcontractors.

"This move demonstrates India's willingness to explore collaborative opportunities on shared interests with Europe," OCCAR said in a statement.

OCCAR-executive administration director Joachim Sucker has handed over the letter of approval (LoA) to Ajit Gupte, India's ambassador to Germany.

India follows Japan, which became the first official OCCAR observer state in the MALE RPAS (Eurodrone) programme in November 2023.

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Science & Technology News

ISRO dispatches crew module for first uncrewed mission of Gaganyaan

Source: The Economic Times, Dt. 22 Jan 2025,

URL: <https://economictimes.indiatimes.com/news/science/isro-dispatches-crew-module-for-first-uncrewed-mission-of-gaganyaan/articleshow/117454154.cms>

Liquid Propulsion Systems Centre of ISRO has dispatched the Crew Module for the first uncrewed mission of Gaganyaan (G1) after successfully completing the integration of the liquid propulsion system, the space agency said on Wednesday. Gaganyaan will be ISRO's first attempt towards acquiring human spaceflight capabilities. Before sending the crew, the ISRO is planning to send uncrewed mission to the space under its Gaganyaan project.

"On 21 January 2025, the Liquid Propulsion Systems Centre (LPSC) of ISRO dispatched the Crew Module for the first uncrewed mission of Gaganyaan (G1), after successfully completing the integration of the liquid propulsion system," ISRO said in a statement.

LPSC, Bengaluru has dispatched the module to Satish Dhawan Space Centre, Sriharikota, officials said.

According to the space agency, the Crew Module Propulsion System (CMPS) is a bi-propellant based Reaction Control System (RCS) and is meant for precise three axis control namely Pitch, Yaw and Roll, of crew module.

The control will be initiated following separation of service module during the descent and re-entry phase until the deployment of parachute-based deceleration system.

"This system employs 12 100N thrusters, pressurisation system with high pressure gas bottles and the propellant feed system along with the associated fluid control components," ISRO said.

A 100 N thrusters are rocket motors, which are used in spacecraft for propulsion, ISRO officials said.

The Crew Module Uprighting System (CMUS) designed by Vikram Sarabhai Space Centre (VSSC) was also integrated to the module at LPSC, the agency said.

It further said that the Crew Module will also undergo further integration operations including avionics package assembly, electrical harnessing and checks at Vikram Sarabhai Space Centre (VSSC) before getting dispatched to U R Rao Satellite Centre, Bengaluru for the final phase of integration of the Orbital Module.

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IISc's FSID, ARAI partner for centre of excellence in mobility innovation

Source: The Times of India, Dt. 21 Jan 2025,

URL: <https://timesofindia.indiatimes.com/science/iiscs-fsid-and-arai-collaborate-to-establish-centre-of-excellence-in-mobility-innovation-/articleshow/117421946.cms>

The Foundation for Science Innovation and Development (FSID) at the Indian Institute of Science (IISc) Monday signed an MoU with the Automotive Research Association of India (ARAI) to establish a Centre of Excellence (CoE) focused on mobility innovation. The signing ceremony took place at the Bharat Mobility Global Expo 2025. The partnership aims to replicate FSID's successful Pravriddhi programme model, which was launched in November 2024. The new CoE will concentrate on research, development, technology innovation, and comprehensive testing services in the mobility sector, with a particular emphasis on safety, sustainability, and reliability.

The collaboration will facilitate joint efforts to identify and onboard key industry partners for co-creating mobility products. The initiative will also focus on knowledge transfer through advanced skilling platforms, bringing together expertise from both academia and industry to ensure world-class product development standards.

“By leveraging IISc's world-class facilities, R&D expertise, and a robust network of strategic partners across India, we aim to drive innovation, sustainability, and safer mobility solutions,” said Prof B Gurumoorthy, Director, FSID. He noted that Pravriddhi builds on their experience of running an accelerator in high-speed rotating machinery with Ministry of Heavy Industry support.

Reji Mathai, Director, ARAI, highlighted their organisation's recent innovations in sustainable mobility, including an Over-Head Automated Charging Device and Hydrogen Fuel Cell Electric Powertrain, which are currently on display at the Expo. The partnership is expected to leverage shared resources and foster govt and corporate collaborations to address critical challenges in the mobility sector, FSID said, while its Director-Product Acceleration, said: “This alliance not only supports mutual growth but also enhances societal impact by enabling the creation of safer and more sustainable mobility systems.”

FSID, promoted by IISc, operates through four entities: CORELabs for corporate research collaboration, STEMCell for deep science startup incubation, TIME² for enterprise innovation, and SEED for rural technology interventions.

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TakeMe2Space tests its AI Lab on ISRO's POEM-4 platform

Source: News Nine, Dt. 22 Jan 2025,

URL: <https://www.news9live.com/science/takeme2space-tests-its-ai-lab-on-isro-poem-4-platform-2802834>

Hyderabad based New Space startup TakeMe2Space has successfully demonstrated its My Orbital Infrastructure Technology Demonstrator (MOI-TD) module on the fourth PSLV Orbital

Experiment Platform (POEM-4). The MOI-TD was one of the 24 payloads launched on the POEM-4 module of the PSLV-C60 flight, that lifted off from Sriharikota on 30 December, 2024, with the primary payloads being a pair of Space Demonstration Experiment (SpaDex) satellites. MOI-TD is the first artificial intelligence laboratory deployed in Earth orbit from India. TakeMe2Space has indicated that all the critical components on the MOI-TD platform have performed flawlessly. TakeMe2Space had previously launched a radiation shielding experiment on the POEM-3 platform, with the PSLV-C58 mission on 1 January, 2024.

TakeMe2Space has tested and validated a sophisticated suite of sensors, actuators and subsystems on its MOI-TD hardware, including Sun sensors, horizon sensors, solar cells, inertial measurement units, reaction wheels, magnetotorquer, airtorquer, the POEM adapter board and an AI accelerator. To test the AI lab, TakeMe2Space uploaded large models from ground stations, executed external code on the hardware, then downloaded the encoded and encrypted results. Camera hardware was integrated onto the lab as well, but this component experienced a critical failure. The engineering team has collected the logs to examine the issue and fix the problems for the next launch.

The Innovative POEM platform

The upper stage of the launch vehicle would have been otherwise discarded after the deployment of the primary payloads. ISRO is maximising the returns from the mission and reducing space debris as well, by integrating power generation and communication capabilities on the spent upper stage. The POEM-4 platform shed its altitude to 350 kilometres after deploying the SpaDex satellites at a 475 kilometre orbit, before commencing operating payloads from academic institutions, private industries, and ISRO's own labs. The approach allows for the demonstration and validation of novel technologies to advance the ambitions of India in the space domain, on an affordable orbital platform.

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Scientists detect chirping cosmic waves in an unexpected part of space

Source: Hindustan Times, Dt. 22 Jan 2025,

URL: <https://www.hindustantimes.com/science/scientists-detect-chirping-cosmic-waves-in-an-unexpected-part-of-space-101737561724992.html>

Scientists have detected cosmic waves that sound like birds chirping in an unexpected place.

These bursts of plasma, called chorus waves, ripple at the same frequency as human hearing. When converted to audio signals, their sharp notes mimic high-pitched bird calls.

Researchers have captured such sounds in space before, but now they have sensed the chirping waves from much farther away: over 62,000 miles from Earth, where they've never been measured before.

“That opens up a lot of new questions about the physics that could be possible in this area,” said Allison Jaynes, a space physicist at the University of Iowa who was not involved with the work.

Scientists still aren't sure how the perturbations happen, but they think Earth's magnetic field may have something to do with it.

The chorus has been picked up on radio antennas for decades, including receivers at an Antarctica research station in the 1960s. And twin spacecraft — NASA's Van Allen Probes — heard the chirps from Earth's radiation belts at a closer distance than the newest detection.

The latest notes were picked up by NASA's Magnetospheric Multiscale satellites, launched in 2015 to explore the Earth and sun's magnetic fields. The new research was published Wednesday in the journal Nature.

Chorus waves have also been spotted near other planets including Jupiter and Saturn. They can even produce high-energy electrons capable of scrambling satellite communications.

“They are one of the strongest and most significant waves in space,” said study author Chengming Liu from Beihang University in an email.

The newfound chorus waves were detected in a region where Earth's magnetic field is stretched out, which scientists didn't expect. That raises fresh questions about how these chirping waves form.

“It's very captivating, very compelling,” Jaynes said. “We definitely need to find more of these events.”

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