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समाचार पत्रों से चयनित अंश

Newspapers Clippings

डीआरडीओ समुदाय को डीआरडीओ प्रौद्योगिकियों, रक्षा प्रौद्योगिकियों, रक्षा नीतियों, अंतर्राष्ट्रीय संबंधों और विज्ञान एवं प्रौद्योगिकी की नूतन जानकारी से अवगत कराने हेतु दैनिक सेवा

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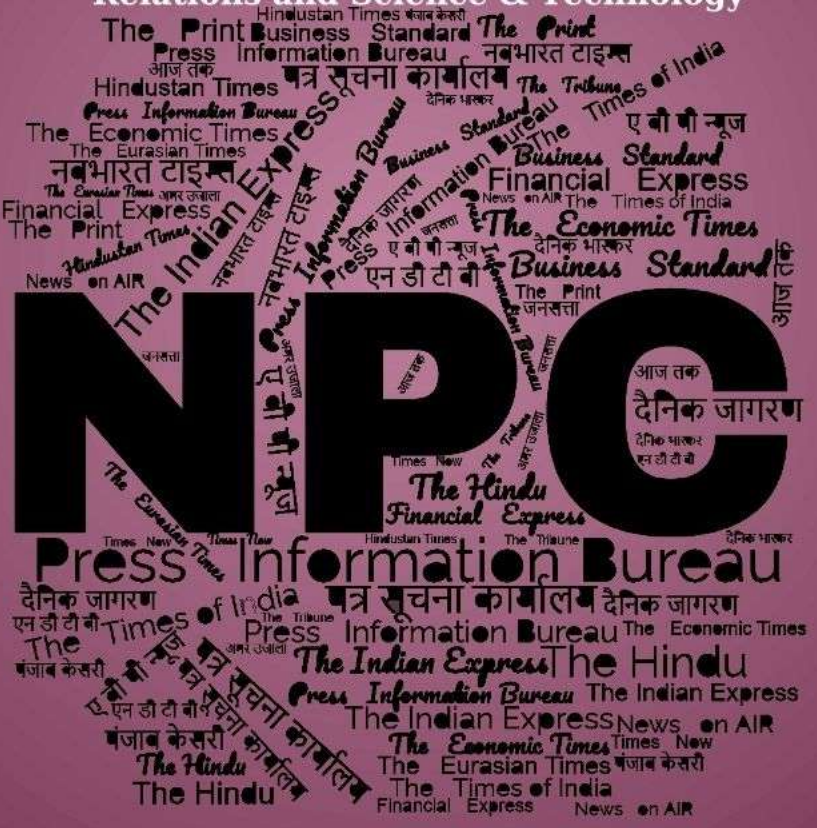

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DRDO News

Tejas LCA AF MK1 test-fires Beyond Visual Range Air-to-Air Missile

Source: Press Information Bureau Dt. 12 March 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2111068

Aeronautical Development Agency (ADA) has successfully conducted test-launch of homegrown ASTRA, Beyond Visual Range Air-to-Air Missile (BVRAAM) from LCA AF MK1 prototype fighter aircraft. The test launch was carried out on March 12, 2025 off the coast of Chandipur, Odisha.

The test-firing successfully demonstrated the direct hit of the missile on flying target. All the subsystems performed accurately meeting all mission parameters and objectives. ASTRA missile is designed and developed by DRDO capable of engaging the targets over 100km and equipped with advanced guidance and navigation capabilities allows missile to destroy targets with greater accuracy. The missile is already inducted into the Indian Air Force.

The successful test-firing is a significant milestone towards the induction of LCA AF MK1A variant. The success is the result of hard work by the integrated team of Scientists, Engineers and Technicians from ADA, DRDO, Hindustan Aeronautics Limited (HAL) along with support from CEMILAC, DG-AQA, IAF & Test range team. Further trials are planned towards the performance evaluation.

Raksha Mantri Shri Rajnath Singh has congratulated the teams of DRDO, IAF, ADA, HAL and all involved in the trial. Secretary, Department of Defence R&D and Chairman DRDO Dr Samir V Kamat appreciated the efforts of Scientists, Engineers and Technicians from various organisations and industry.

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Aatmanirbhar Bharat: Rs 2,906 crore contract signed with BEL for Low-level Transportable Radar (Ashwini) for IAF

Source: Press Information Bureau Dt. 12 March 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2110849

As part of the Government's efforts to strengthen indigenous defence capabilities of the country, Ministry of Defence has inked a capital acquisition contract with Bharat Electronics Limited (BEL), Ghaziabad for the procurement of Low-level Transportable Radar, LLTR (Ashwini) at a cost of Rs 2,906 crore. The radar is indigenously designed and developed by Electronics & Radar Development Establishment, DRDO. The contract was signed in the presence of Defence Secretary Shri Rajesh Kumar Singh in New Delhi on March 12, 2025.

LLTR (Ashwini) is an active electronically scanned phased array radar based on state-of-the-art solid state technology. The radar is capable of tracking aerial targets from high-speed fighter aircraft to slow moving targets such as Unmanned Aerial Vehicles and helicopters. Its acquisition will significantly enhance the operational preparedness of the Indian Air Force.

The programme is a major step towards achieving self-reliance in defence manufacturing by reducing dependency on Foreign Origin Equipment Manufacturers besides acting as a catalyst for the development of defence industrial ecosystem in the country.

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Defence News

Defence Strategic: National/International

VISIT OF AIR CHIEF MARSHAL AP SINGH, CHIEF OF AIR STAFF TO HQ SAC FOR SOUTHERN AIR COMMAND COMMANDERS' CONFERENCE - 12 MAR 2025

Source: Press Information Bureau, Dt. 13 March 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2111023

Air Chief Marshal AP Singh, Chief of the Air Staff (CAS) visited Headquarters Southern Air Command on 12 Mar 25 for the Commanders' Conference of Southern Air Command (SAC) in Thiruvananthapuram. He was received by Air Marshal B Manikantan, Air Officer Commanding-in-Chief SAC and was presented with a ceremonial Guard of Honour on his arrival.

The Air Chief was briefed on various issues, including Air Defence of the southern region, operational preparedness of SAC and enhanced capability in Maritime Air Operations. The CAS complimented SAC for maintaining a credible operational posture and for its contribution to humanitarian assistance and disaster relief across the Southern peninsula.

During the conference, the CAS interacted with Commanders of Air Force Stations under SAC and emphasised on the impact of emerging technologies, the need for capability enhancement and harnessing the full potential of human resources. The CAS drew the attention of the Commanders towards hybrid nature of future warfare where the spectrum of conflict is likely to spread across multiple domains. He also stressed upon adopting innovative measures to counter the increased security challenges and to preserve our assets. He urged the Commanders to keep pace with global developments in the domains of space, cyber and electronic warfare.

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DELIVERY OF YARD 133 (LSAM 23)

Source: Press Information Bureau, Dt. 12 March 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2110906

Induction ceremony of **ninth** Ammunition Cum Torpedo Cum Missile (ACTCM) Barge, LSAM 23 (Yard 133) was held on **12 Mar 25** at Naval Dockyard, Mumbai. Chief Guest for Induction Ceremony was Cmde Manish Vig, GM (QA), ND (Mbi).

The contract for construction and delivery of **eleven** ACTCM Barges was concluded with **M/s Suryadipta Projects Pvt. Ltd., Thane** on 05 Mar 21, **a MSME Shipyard**. Eight ACTCM Barges have already been delivered and the shipyard has also been awarded a contract for construction and delivery of **four Sullage Barges** to the Indian Navy thereby highlighting the Indian Navy's commitment towards encouraging MSMEs.

The Shipyard has **indigenously** designed these Barges in collaboration with an Indian Ship Designing firm and subsequently model tested at Naval Science and Technological Laboratory, Visakhapatnam, successfully to ensure seaworthiness. These barges are built in accordance with the relevant Naval Rules and Regulations of Indian Register of Shipping (IRS). These Barges are proud flag bearers of **Make in India** and ***Aatmanirbhar Bharat*** initiatives of Government of India.

Induction of these Barges would provide impetus to operational commitments of Indian Navy by facilitating **Transportation, Embarkation and Disembarkation of articles/ ammunition** to Indian Navy platforms both alongside jetties and at outer harbours.

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ICGS Saksham makes port call at Port Victoria, Seychelles for a three-day visit

Source: Press Information Bureau, Dt. 12 March 2025,
URL:https://pib.gov.in/PressReleasePage.aspx?PRID=2110896

Indian Coast Guard (ICG) Offshore Patrol Vessel Saksham made a port call at Port Victoria, Seychelles, on March 12, 2025 for a three-day visit aimed at strengthening maritime cooperation and fostering regional partnerships. The crew of the ship will engage in a series of interactions, including high-level calls on local dignitaries, joint training exercises, and sporting events with their counterparts. These engagements will enhance interoperability, promote mutual learning, and reinforce the strong maritime ties between India and Seychelles.

The National Cadet Corps (NCC) cadets onboard the vessel will participate in a Walkathon and a beach cleanup activity, contributing to the Government's 'Puneet Sagar Abhiyan' campaign aimed towards environmental sustainability and marine conservation. Additionally, 10 personnel from Assam Rifles embarked on the ship will facilitate inter-agency cooperation, providing the personnel with exposure to maritime operations while fostering camaraderie and knowledge exchange between the two forces.

Following its visit to Seychelles, ICGS Saksham will proceed to Madagascar as part of its overseas deployment plan, furthering diplomatic engagements and enhancing Coast Guard-to-Coast Guard collaboration in the Indian Ocean Region (IOR). The visit underscores ICG's commitment to maritime security, regional cooperation, and fostering strong bilateral ties with nations in the IOR.

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Army, IAF conduct synergised exercise to enhance interoperability

Source: The Tribune, Dt. 12 March 2025,
URL: https://www.tribuneindia.com/news/j-k/army-iaf-conduct-synergised-exercise-to-enhance-interoperability/

To tackle the menace of terrorism, especially in dense forest areas of Jammu division, the Indian Air Force (IAF) and Army conducted a 'Synergised Interoperability Exercise' in the region.

"The exercise aimed to strengthen coordination between ground and air forces, ensuring seamless integration of aerial and land-based operations in dynamic battlefield scenarios. By refining joint operational tactics, this exercise reinforced the ability of both forces to respond swiftly and effectively to real-time challenges, particularly in high-threat environments," an official spokesperson of Army said.

The exercise was conducted under the aegis of Tiger Division. "The exercise simulated real-world operational conditions, with IAF helicopters executing a precise airlift of Army troops from a designated mounting base. The troops were then inserted into terrain characterised by dense vegetation and thick undergrowth. This complex insertion manoeuvre tested the forces' ability to operate cohesively in challenging environments, where mobility and coordination are crucial for mission success," the spokesperson said.

Following the insertion, the troops executed a simulated combat assault, engaging in coordinated manoeuvres designed to neutralise threats in a high-risk environment. The exercise also incorporated surveillance operations, precision firepower tactics and rapid troop extraction, ensuring that personnel were prepared for complex missions requiring agility and strategic decision-making. The training provided an opportunity for soldiers and aircrew to rehearse real-time battlefield contingencies, improving reaction times and enhancing overall preparedness.

The spokesperson said, "The Army and Indian Air Force continue to invest in joint training initiatives, enhancing their ability to conduct multi-domain operations in varied terrains. This synergised interoperability exercise reaffirmed their commitment to maintaining a high state of operational readiness, ensuring that both forces remain well-prepared to safeguard national security and respond to emerging threats effectively."

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IAF chief calls for joint military strategy to tackle new-age warfare

Source: The Week , Dt. 12 March 2025,
URL: https://www.theweek.in/news/defence/2025/03/12/iaf-chief-calls-for-joint-military-strategy-to-tackle-new-age-warfare.html

Chief of the Air Staff (CAS) Air Chief Marshal A.P. Singh called for rapid capability enhancements of India's armed forces to counter emerging security challenges in the evolving geo-strategic landscape.

Addressing student officers from the Indian armed forces who are undergoing the 80th Staff Course, along with the permanent faculty at the Defence Services Staff College (DSSC), Wellington in Tamil Nadu, he urged them to be ready to welcome change, critically assess evolving threats, and design adaptive strategies for future conflicts.

Highlighting the importance of jointmanship, he said integrated training and operational synergy among the three services is the need of the hour to boost combat effectiveness.

The CAS offered a strategic perspective on the Indian Air Force (IAF), the ongoing capability development initiatives of the force, and stressed the importance of unified operations in modern warfare.

During his visit, the CAS was briefed on the DSSC's training activities and its emphasis on fostering jointmanship among the armed forces, which is a key aspect of modern military preparedness. He hailed the institution's role in shaping future military leaders through rigorous academic and professional training, a statement from the defence ministry said.

"The visit reaffirmed the IAF's commitment to enhancing joint operational capabilities and strengthening inter-service cooperation, ensuring a well-prepared leadership for the challenges of tomorrow," the ministry further stated.

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From .303 to SLR: Indian Army Trains Poonch Villagers To Take On Terrorists

Source: Republic World, Dt. 12 March 2025,
URL: https://www.republicworld.com/defence/from-303-to-slr-indian-army-trains-poonch-villagers-to-take-on-terrorists

In a move to train Village Defence Guards (VDGs) with sophisticated weapons, the Indian Army has started specialized training for Village Defence Guards (VDGs) in the border district of Poonch, where VDGs are being trained with newly inducted semi-automatic Self-Loading Rifles (SLRs). This comes as the Government of Indian has decided to upgrade the weapons from the outdated .303 rifles that were previously in use by the VDGs, but at times have proved to be detrimental, and now the VDGs across the Jammu region are being given SLR rifles.

39 Rashtriya Rifles Unit of Indian Army, which is operational unit of Army in hinterland, is conducting training sessions of VDG members to ensure that these members are well-versed in handling and operating the advanced weaponry.

> Locals who are part of VDG said, "At Jullas ground, we are being trained by Indian Army as we recently got the upgrade of the weapon from .303 to SLR rifles and with assistance from Army, we are capable enough to tackle any threat to us, our village and country. We are also undergoing firing drills with active assistance from Indian Army and also how to keep the weapon in finest condition".

The development comes at a time when security forces are on high alert following a spate of terror attacks in Rajouri and Poonch. Over the past two years, the region has witnessed close to 10 major terror incidents, primarily targeting security personnel operating in these sensitive border areas including major terror attack like that of Bhatta Durriyan, Dera Ki Gali, Kandi and in Dhangri area of Rajouri which have claimed more than 20 lives in these four attacks by terrorists.

Who Are Village Defence Guards (VDGs)?

Village Defence Committees (VDCs), earlier known as Village Defence Committees (VDCs) were first setup in the mid-1990s in Doda region and then in other districts for the self-defence of locals in remote hilly villages against terrorism, especially to protect Hindus and minority Muslims. The first VDC was set up under Shesh Paul Vaid, former DGP J&K, when he was a Superintendent of police in Bagankote village, Udhampur (now Reasi) in 1995.

J&K DGP Reviews Security In Pir Panjal Amid Rising Terror Threats

Jammu and Kashmir Director General of Police (DGP) Nalin Prabhat was on a two-day visit to the Rajouri-Poonch region. The DGP visited forward areas along the Line of Control (LoC) in Poonch, where he assessed the current security situation and reviewed the operational preparedness of forces stationed in the region. During his visit, DGP Prabhat held a series of high-level meetings with senior officials from the Army, paramilitary forces, and the J&K Police to discuss counter-terror strategies and ongoing anti-terror operations.

Special focus was given to strengthening intelligence networks, ensuring enhanced coordination between security agencies, and addressing any operational challenges faced by ground forces. Security forces in Rajouri and Poonch remain on high alert, with intensified anti-terror operations underway to neutralize Pakistani terrorists of Lashkar E Taiba which are active in the area for more than a year's time.

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IAF Pushes for 114 New Multirole Fighters Amid Rising Threats and a Potetial Two-Front War Scenario

Source: Republic World, Dt. 12 March 2025,
URL: https://www.republicworld.com/defence/indian-armed-forces/iaf-pushes-for-114-new-multirole-fighters-amid-rising-threats-and-a-potetial-two-front-war-scenario

The Indian Air Force (IAF) is gearing up for a massive fighter jet procurement, with a high-level committee giving the green light for the induction of 114 multirole fighter aircraft (MRFA)

through a fast-tracked global tender. The move, aimed at bolstering combat strength, comes as the IAF stares at the retirement of 10 squadrons by 2037, including the iconic Jaguar, Mirage-2000, and MiG-29 jets.The committee, headed by Defence Secretary Rajesh Kumar Singh, submitted its report to Defence Minister Rajnath Singh, reinforcing the urgent need for new jets to keep up with India's security requirements. The IAF wants these aircraft to start arriving in the next four to five years, ensuring squadron strength doesn't plummet further as older jets are phased out.

IAF's Numbers Game: 60 Squadrons by 2047?

The IAF's long-term goal is 60 fighter squadrons by 2047, a benchmark needed to counter a two-front war scenario involving China and Pakistan. But with squadron strength steadily dipping, that goal seems ambitious—unless procurement moves faster than it historically has.

To fill the gap, the IAF is relying on a mix of foreign fighters and indigenous aircraft like the LCA Tejas Mark 1A and Mark 2, which are still in various stages of development and induction. While 36 Rafale jets have already boosted India's air superiority, the force still needs additional squadrons to maintain an edge.

The MRFA Race: Who's in the Running?

The upcoming MRFA tender is set to be a high-stakes battle among some of the world's most advanced fighter jets. The lineup is likely to include:

- **Dassault Rafale (France) –** Already operational with the IAF, the twin-engine jet could have an edge if India opts for continuity.
- **Saab Gripen (Sweden) –** A lightweight, single-engine fighter, known for its cost-effectiveness and versatility.
- **Eurofighter Typhoon (European consortium) –** Previously evaluated under the MMRCA contest, this jet offers cutting-edge avionics.
- **MiG-35 (Russia) –** An advanced version of the MiG-29, though Russia's ability to fulfil orders amid its Ukraine war commitments remains questionable.
- **F-16 (Lockheed Martin, USA) –** Offered as the F-21 to India, it's a combat-proven aircraft but faces tough competition.
- **F-15EX Strike Eagle (Boeing, USA) –** The only new entrant in this race, this heavyweight air superiority fighter could be a game-changer.
- **Fast-Tracking the Process: No Time for Red Tape**

Given past delays in aircraft procurements, the IAF is pushing for a quick selection process. Instead of full-fledged trials, only limited tests may be conducted to validate the performance of these jets. This would cut down the bureaucratic red tape and help speed up delivery timelines.

While the IAF is eager to induct these jets, there are roadblocks that could cause delays. Global supply chain disruptions, particularly in the U.S. due to commitments in Ukraine and Israel, could slow down deliveries. The defence budget will also play a role—procuring 114 fighters could cost upwards of $15-20 billion, making this one of the largest-ever defence deals in India's history.

With summer 2025 shaping up to be a crucial period for India's fighter jet roadmap, all eyes will be on how fast this procurement moves. As older jets retire and new threats emerge, the IAF's modernization drive will define India's air dominance for the next two decades.

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Indian Army to deploy Sherp ATVs for UN peacekeeping mission in South Sudan

Source: Business Standard, Dt. 12 March 2025,

URL: https://www.business-standard.com/external-affairs-defence-security/news/indian-army-to-deploy-sherp-atvs-for-un-peacekeeping-mission-in-south-sudan-125031300215_1.html

The Indian Army is set to deploy indigenously developed Sherp All-Terrain Vehicles (ATVs) for peacekeeping operations under the United Nations Mission in South Sudan (UNMISS), significantly enhancing mobility in extreme terrain conditions.

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

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

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

Meanwhile, Border Security Force (BSF) personnel posted at the India-Pakistan border in Jaisalmer showered 'Gulal' and participated in celebrations ahead of tomorrow's Holi festival.

Visuals showed the personnel exchanging sweet embraces and eating sweets. They also played with colours and danced their hearts out.

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BrahMos NG set for first flight in 2026, production to begin by 2027-28

Source: Financial Express, Dt. 11 March 2025,

URL: https://www.financialexpress.com/business/defence-brahmos-ng-set-for-first-flight-in-2026-production-to-begin-by-2027-28-3746919/

The next-generation BrahMos missile, known as BrahMos NG, is approaching its first flight test, slated for 2026, with production set to commence in 2027-28.

Jaiteerth R Joshi, Director General of BrahMos Aerospace, a joint venture between India and Russia, revealed that the BrahMos NG, while retaining the same capabilities as its predecessor, is designed to be more compact and lightweight. “We are developing state-of-the-art technologies to make the missile sleeker without compromising on its effectiveness,” Joshi stated. He also stressed that the missile is in its advanced stages of development, with the first flight run expected within a year.

When asked about the production timeline, Joshi added, “The missile will be ready for production in about 1 to 1.5 years after the initial flight test.”

Enhanced Features and Platform Integration

The BrahMos NG will maintain its predecessor’s impressive range of 290 kilometers while offering a more lightweight design. Due to its reduced size, the next-generation missile system will be able to fit on a wider array of platforms. These include the Russian-origin Sukhoi-30MKI fighter aircraft and India’s indigenously developed Light Combat Aircraft (LCA) Tejas, both of which will now be capable of deploying the BrahMos NG.

Export Opportunities

The export potential for BrahMos NG has been expanding, with the missile already seeing interest from countries in Africa and West Asia. In a landmark move, India has supplied three batteries of the BrahMos supersonic cruise missile system to the Philippines, and talks are progressing with Indonesia.

Financial Express.com has reported recently that during a state visit to India in January, Indonesian President Prabowo Subianto was briefed on the missile’s capabilities at the BrahMos headquarters in Delhi, and the two nations have reportedly reached an understanding on pricing for the deal, estimated at USD 450 million. If finalized, Indonesia will become the second Asean nation to buy the BrahMos missile system after the Philippines, which signed a deal worth approximately USD 375 million in 2022 to equip its Marines with the system.

Technical Specifications and Capabilities

The BrahMos NG is significantly smaller and lighter than its predecessor. Weighing 1.6 tonnes and measuring 6 meters in length, it is much more compact compared to the earlier version, which weighed 3 tonnes and was 9 meters long. Despite its smaller size, the missile retains a top speed of 3.5 Mach and a range of 290 kilometers. Additionally, the BrahMos NG boasts a reduced radar cross-section and features an indigenous seeker with an AESA radar, enhancing its precision and stealth capabilities.

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Rafale Fighters May Get Indo-Russian R-37M Missiles As Delhi, Moscow Discuss JV On Air-To-Air Missiles?

Source: Eurasian Times, Dt. 11 March2025,
URL:https://www.eurasiantimes.com/rafale-fighters-to-get-indo-russian-r-37m-missiles/

Russia and India are discussing the "joint development and production of modern guided aircraft missiles," according to Rosoboronexport (ROE).The two countries are exploring the "possibility of joint production with the Indian side and the promotion of military products to third countries friendly to Russia."Russia believes that joint venture and development and production is necessary to "free up the capacities of Russian defense industry enterprises for the most efficient implementation of the state defense order."

Paradigm Shift

According to ROE, technological cooperation, not weapons export, is now the leading trend in the global arms market. India and Russia were early trend setters, and Russia's largest technological cooperation has been with India.

According to Rosoboronexport forecasts, by 2030 technology contracts will account for 40% of the global market for military products, which is twice the current figures.

Rosoboronexport aims to expand technological partnerships in the global market. It "has recently successfully implemented more than ten large technological projects for the joint production of products for various branches of the armed forces, and ten more are currently being implemented."

"Technological partnership is not only new opportunities for Russia, but also strengthening ties with friendly countries."

R-73E Local Manufacture

Unconfirmed reports during Aero India 2024 indicated that Adani Defence and Aerospace will locally produce the R-73E missile.

There has been no official statement from Adani Defence, nor is there a mention of the project on the company's website.

The Vympel R-73E (Export variant of the R-73 AA-11 Archer) is an all-aspect IR passive homing WVR (close) Combat missile, a successor to the R-60 (AA-8 Aphid) missile. The missile is produced by Russia's Tactical Missile Weapons Corporation (TRV).

The R-73 has a cryogenic-cooled (MK-80) seeker and uses thrust vectoring for maneuvering, giving it a substantial (45 deg either side) off-boresight capability.

Russia has developed several advanced versions of the R-73 missile. These include

- R-73M – Improved model.
- R-74 (izdeliye 740) – Improved model with ±60° off-boresight.

- RVV-MD – Export model of the R-74. The RVV-MD variant has increased anti-jamming protection including optical jamming.
- K-74M (izdeliye 750) – Improved model with ±75° off-boresight.
- K-74M2 (izdeliye 760) – Further improved variant with reduced cross-section for the Sukhoi Su-57. Intended to match the AIM-9X and ASRAAM.

Past Procurements

In June 2019, different news outlets reported that Vympel had offered the RVV-MD short-range missile, the RVV-SD medium-range missile, and the RVV-BD long-range missile to India.

However, in July 2019, military sources in Moscow and New Delhi told Jane's that India had placed an order for AAMs comprising 300 R-73E (AA-11 'Archer') IR-guided, short-range missiles.

The order additionally included 300 R-27 (AA-10 'Alamo') infrared-guided (IR) or semi-active radar-guided, medium-to-long-range missiles and 400 R-77 (AA-12 'Adder') active radar-guided, medium-range missiles.

The R-73E local production report may or may not be correct. What is clear, however, is that Russia's scope of collaboration extends well beyond a single air-to-air missile.

Imperative For Local Production

The conflict in Ukraine underscores the critical importance of a nation's capacity to produce ammunition domestically required for sustained military engagements.

Historically, the Indian Air Force (IAF) has faced challenges in acquiring and maintaining adequate stocks of air-to-air missiles.

Notably, during the post-Balakot skirmish on February 27, 2019, IAF Su-30MKIs were equipped with R-77 missiles, which had a shorter range compared to Pakistan's AIM-120 missiles. This disparity highlighted the need for longer-range missile capabilities.

Recognizing this gap, India placed the earlier referred to order for 1,000 air-to-air missiles to bolster its arsenal. To further enhance its capabilities, the IAF should consider acquiring the Russian R-37M missile, renowned for its operational success in the Ukraine conflict.

Importantly, establishing domestic production of the R-37M would ensure that Indian fighters can effectively engage adversaries and maintain a strategic advantage in aerial combat.

India-Russia Joint Development Productions

India and Russia have a longstanding defense partnership that has included numerous joint development and local production initiatives.

The defense partnership is deep and goes back to the 1960s. Here is a look back mostly limited to the past two decades. The two countries cooperated on local production in India of Su-30MKI fighters, tanks, infantry fighting vehicles, and ammunition.

Since 2006, the BrahMos missile has been a cornerstone of India-Russia collaboration. Developed jointly by India's Defence Research and Development Organisation (DRDO) and Russia's NPO Mashinostroyenia, it is recognized as one of the fastest supersonic cruise missiles globally.

The Indo-Russian Rifles Private Limited (IRRPL), a joint venture formed in 2019, has been producing AK-203 rifles at a facility in Korwa, Uttar Pradesh. As of early 2025, 40,000 rifles have been delivered to the Indian Ministry of Defence, with plans to manufacture over 600,000 units, aiming for 100% localization.

In March 2025, India signed a $248 million agreement with Russia's Rosoboronexport to procure advanced 1,000 horsepower engines for its T-72 battle tanks. This deal includes technology transfer to India's Armoured Vehicles Nigam Ltd for local production, enhancing the mobility and offensive capabilities of India's armored fleet.

In February 2025, Russia offered India the opportunity to produce its advanced Su-57 stealth fighter jets domestically. This proposal includes full technology transfer and aligns with India's goal of boosting domestic defense production for enhanced self-reliance.

Gandiva Astra Mk-3

It's interesting to note that the Astra Mk-3 missile, recently named as Gandiva, was developed from the SFDR (solid fuel ducted ramjet) project, which started as a joint development project between DRDO and Rosoboronexport

Russia and India jointly developed the critical propulsion technology and high-tech subsystems for the missile, such as a nozzle-less booster, fuel flow controller, and boron-based sustainer. Subsequently, DRDO pursued the project independently.

Conclusion

ROE has offered to adapt jointly produced Russian missiles for integration with partner nations' aircraft, potentially enabling India to equip its entire fighter fleet with domestically produced Russian air-to-air missiles.

Notably, the Indian Air Force (IAF) has acquired the software source code for its Rafale fighters, facilitating the integration of various weapon systems.

This strategic move could allow the IAF to arm its Rafale jets with indigenous R-37M missiles, enhancing their combat capabilities.

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Science & Technology News

Dr. Jitendra Singh says, "Technology Parks" are being developed to facilitate Deep-tech StartUps

Dr Jitendra Singh disclosed that four existing technology innovation hubs into Technology Translation Research Parks (TTRP) to facilitate deep-tech startups and industry-academia partnerships

These hubs, located at IIT Kanpur (cybersecurity), IISc Bangalore (robotics and autonomous navigation), IIT Indore (healthcare), and ISM Dhanbad (mining), will provide infrastructure and support for translational research.

Dr. Jitendra Singh Reviews Key Science & Technology Initiatives, Highlights Progress on Hydrogen Valley and Quantum Mission

Dr. Jitendra Singh Pushes for Industry-Academia Collaboration in Science & Tech Review Meeting

Source: Press Information Bureau, Dt. 12 March 2025,
URL: https://indianexpress.com/article/technology/science/christopher-columbus-tricked-jamaicans-total-lunar-eclipse-blood-moon-9880612/

Union Minister of State (Independent Charge) for Science and Technology; Earth Sciences and Minister of State for PMO, Department of Atomic Energy, Department of Space, Personnel, Public Grievances and Pensions, Dr. Jitendra Singh said here today that "Technology Parks" are being developed to facilitate Deep-tech StartUps.

Chairing a high-level review meeting with the Secretary and senior officials of the Department of Science and Technology (DST) to assess ongoing projects and future initiatives, Dr Jitendra Singh disclosed that four existing technology innovation hubs into Technology Translation Research Parks (TTRP) to facilitate deep-tech startups and industry-academia partnerships. These hubs, located at IIT Kanpur (cyber security), IISc Bangalore (robotics and autonomous navigation), IIT Indore (healthcare), and ISM Dhanbad (mining), will provide infrastructure and support for translational research.

The meeting focused on India's progress in emerging technology domains, including hydrogen energy, quantum computing, and technology innovation hubs.

During the discussion, Dr. Jitendra Singh was briefed on the National Green Hydrogen Mission, where DST is set to be the implementing agency.

Dr. Jitendra Singh emphasized the need for coordination with the Ministry of New and Renewable Energy (MNRE) to expedite implementation and ensure effective policy alignment.

The Minister also reviewed advancements under the National Quantum Mission, where India has established four quantum technology hubs at IISc Bangalore, IIT Bombay, IIT Delhi, and IIT Madras. These hubs focus on computing, communication, sensing, metrology, materials, and devices.

Officials reported that the mission has so far supported eight quantum startups, two of which—QPi AI and QNU Labs—are developing advanced quantum computing and communication solutions. Dr. Jitendra Singh highlighted the importance of industry collaboration to accelerate quantum research and its commercial applications.

In addition, the meeting covered the upgrade of four existing technology innovation hubs into Technology Translation Research Parks (TTRP) to facilitate deep-tech startups and industry-academia partnerships. These hubs, located at IIT Kanpur (cyber security), IISc Bangalore (robotics and autonomous navigation), IIT Indore (healthcare), and ISM Dhanbad (mining), will provide infrastructure and support for translational research.

The Minister also discussed India's growing international collaborations in science and technology. He acknowledged recent engagements with global partners, including the United States and European Union, to strengthen research cooperation. Officials highlighted that India is set to participate as an associate member in the EU's Horizon research program, pending financial and policy negotiations.

Dr. Jitendra Singh reiterated the government's commitment to advancing technology-driven solutions and creating opportunities for Indian scientists, entrepreneurs, and researchers. The meeting concluded with a directive to fast-track the implementation of key projects and ensure sustained momentum in India's scientific and technological growth.

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Department of Biotechnology, Govt. of India and Govt. of Assam Sign Historic MoU for Centre-State Partnership under the BioE3 Policy

Source: Press Information Bureau, Dt. 12 March 2025,
URL: https://scitechdaily.com/astronomers-just-traced-mysterious-radio-pulses-to-an-unusual-star-duo/

The Department of Biotechnology (DBT) and the Government of Assam signed a landmark Memorandum of Understanding (MoU) under the BioE3 (Biotechnology for Economy, Environment, and Employment) Policy. This Centre-State partnership is the first of its kind under the BioE3 framework and aims to accelerate high-performance biomanufacturing while fostering a sustainable biotechnology ecosystem in Assam.

The MoU signing is a culmination of extensive consultations, high-level meetings, and collaborative efforts made by the DBT and the Government of Assam. A landmark step in this journey was the Centre-State Partnership Conclave held last month under the chairpersonship of Hon'ble Union Minister of Science & Technology, Dr. Jitendra Singh Ji where the State Governments were encouraged to foster collaborations with the DBT and establish State BioE3 Cells.

The BioE3 Policy, approved by the Union Cabinet on 24th August 2024, envisages to establish India as a global leader in bio-based innovations, emphasizing sustainable biomanufacturing across various thematic areas including bio-based chemicals, APIs, biopolymers, enzymes, climate-resilient agriculture, functional foods, smart proteins, carbon capture& utilization, precision biotherapeutics (cell & gene therapy, mRNA therapeutics & monoclonal antibody), as well as futuristic marine and space research. By integrating these diverse fields, the Policy seeks to drive both economic growth and environmental sustainability. These Sectors will be augmented by BioEnablers (setting up of Biofoundries, Biomanufacturing and BioAI Hubs)

The MoU signed between DBT, and the Government of Assam formalizes a strategic collaboration in which DBT will extend its guidance and facilitate partnerships, while the Government of Assam will spearhead initiatives by establishing a State BioE3 Cell and developing an Assam BioE3 Action Plan. This collaboration underscores Assam's proactive approach to harnessing its rich biodiversity and agricultural strength to build a robust biomanufacturing ecosystem in the State.

The MoU signing took place at DBT headquarters in New Delhi, in the presence of key dignitaries- Dr. Rajesh S. Gokhale, Secretary, DBT, DG BRIC and Chairman BIRAC; Dr. Ravi Kota, Chief Secretary, Government of Assam, Dr. Alka Sharma, Senior Adviser/Sc'H', DBT; Shri Pallav Gopal Jha, Secretary, Department of Science, Technology & Climate Change, Government of Assam; andDr. Jitendra Kumar, MD, BIRAC.

Dr. Ravi Kota, Chief Secretary, Government of Assam, in his address, underscored that the Assam Cabinet has approved the Assam BioE3 Action Plan and established a dedicated State-level BioE3 Cell, underscoring Assam's proactive approach to biotechnology innovation, and added that several discussion meetings with key stakeholders were held to refine the Action Plan and ensure it aligns with the State's strategic objectives.

Speaking at the momentous occasion, Dr. Rajesh S. Gokhale, Secretary, DBT, highlighted the crucial role of Centre-State partnership in achieving the goals of the BioE3 Policy by establishing BioE3 Cells in the States. He emphasized that the BioE3 Policy is a transformative framework for sustainable growth, job creation, and environmental stewardship. This MoU marks a new chapter in Centre-State collaboration and sets a strong foundation for the future of biotechnology in Assam.

This MoU between DBT and the Government of Assam, not only signifies a pivotal moment in Centre-State collaboration under the BioE3 Policy but also lays the groundwork for a new era of transformative innovation, sustainable economic growth, and inclusive employment opportunities. With this partnership, both DBT, Govt. of India and the Govt. of Assam are charting a course toward a resilient and environmentally responsible biotechnology ecosystem that will benefit India for generations to come.

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Liftoff! NASA's Twin Missions Launch to Unravel the Big Bang & Solar Storms

Source: Sci Tech Daily, Dt. 12 March 2025,
URL: https://scitechdaily.com/waters-hidden-side-revealed-it-can-exist-in-two-liquid-forms-at-once/

SPHEREx, NASA's latest astrophysics observatory, has launched aboard a Falcon 9 rocket alongside PUNCH, a mission studying solar wind.

SPHEREx will create a 3D map of the universe, helping to uncover cosmic history and the building blocks of life. Its observations will complement those of telescopes like Hubble and Webb, offering insights into how galaxies formed and evolved. Meanwhile, PUNCH will investigate how the Sun's corona generates solar wind and space weather, which can impact Earth. The successful launch marks the start of groundbreaking discoveries in both cosmic origins and the Sun's influence on space.

A Dual Mission: SPHEREx and PUNCH

NASA's latest space observatory, SPHEREx, is now on its way to explore the origins of the universe, the history of galaxies, and the building blocks of life in our galaxy. Short for Spectro-Photometer for the History of the Universe, Epoch of Reionization, and Ices Explorer, SPHEREx launched at 8:10 p.m. PDT on March 11 aboard a SpaceX Falcon 9 rocket from Vandenberg Space Force Base in California.

Joining SPHEREx on the Falcon 9 were four small satellites from NASA's PUNCH (Polarimeter to Unify the Corona and Heliosphere) mission, designed to study how the Sun's outer atmosphere transforms into the solar wind—the stream of charged particles that flows through the solar system.

"Everything in NASA science is interconnected, and sending both SPHEREx and PUNCH up on a single rocket doubles the opportunities to do incredible science in space," said Nicky Fox, associate administrator, Science Mission Directorate at NASA Headquarters in Washington.

“Congratulations to both mission teams as they explore the cosmos from far-out galaxies to our neighborhood star. I am excited to see the data returned in the years to come.”

SPHEREx Comes to Life in Space

Ground controllers at NASA’s Jet Propulsion Laboratory (JPL) in Southern California, which manages SPHEREx, established communications with the space observatory at 9:31 p.m. PDT. The observatory will begin its two-year prime mission after a roughly one-month checkout period, during which engineers and scientists will make sure the spacecraft is working properly.

“The fact our amazing SPHEREx team kept this mission on track even as the Southern California wildfires swept through our community is a testament to their remarkable commitment to deepening humanity’s understanding of our universe,” said Laurie Leshin, director, NASA JPL. “We now eagerly await the scientific breakthroughs from SPHEREx’s all-sky survey — including insights into how the universe began and where the ingredients of life reside.”

A SpaceX Falcon 9 rocket, carrying NASA’s SPHEREx observatory and PUNCH satellites, launches from Space Launch Complex 4 East at Vandenberg Space Force Base in California on Tuesday, March 11, 2025

PUNCH Satellites Begin Their Mission

The PUNCH satellites successfully separated about 53 minutes after launch, and ground controllers have established communication with all four PUNCH spacecraft. Now, PUNCH begins a 90-day commissioning period where the four satellites will enter the correct orbital formation, and the instruments will be calibrated as a single “virtual instrument” before the scientists start to analyze images of the solar wind.

The two missions are designed to operate in a low Earth, Sun-synchronous orbit over the day-night line (also known as the terminator) so the Sun always remains in the same position relative to the spacecraft. This is essential for SPHEREx to keep its telescope shielded from the Sun’s light and heat (both would inhibit its observations) and for PUNCH to have a clear view in all directions around the Sun.

Mapping the Universe in 3D

To achieve its wide-ranging science goals, SPHEREx will create a 3D map of the entire celestial sky every six months, providing a wide perspective to complement the work of space telescopes that observe smaller sections of the sky in more detail, such as NASA's James Webb Space Telescope and Hubble Space Telescope.

The mission will use a technique called spectroscopy to measure the distance to 450 million galaxies in the nearby universe. (See video below.) Their large-scale distribution was subtly influenced by an event that took place almost 14 billion years ago known as inflation, which caused the universe to expand in size a trillion-trillionfold in a fraction of a second after the big bang. The mission also will measure the total collective glow of all the galaxies in the universe, providing new insights about how galaxies have formed and evolved over cosmic time.

Probing for the Building Blocks of Life

Spectroscopy also can reveal the composition of cosmic objects, and SPHEREx will survey our home galaxy for hidden reservoirs of frozen water ice and other molecules, like carbon dioxide, that are essential to life as we know it.

"Questions like 'How did we get here?' and 'Are we alone?' have been asked by humans for all of history," said James Fanson, SPHEREx project manager at JPL. "I think it's incredible that we are alive at a time when we have the scientific tools to actually start to answer them."

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SpaceX delays ISS mission to bring stuck NASA astronauts Sunita Williams, Butch Wilmore home

Source: Hindustan Times, Dt. 13 March 2025,
URL: https://www.hindustantimes.com/world-news/spacex-delays-iss-mission-to-replace-nasas-stranded-crew-including-sunita-williams-over-pad-issue-101741822734425.html

SpaceX delayed the planned launch of Crew-10 on Wednesday due to a last-minute technical issue with the rocket's launchpad. The mission was set to send four replacement astronauts to the International Space Station (ISS), paving the way for the long-overdue return of US astronauts Butch Wilmore and Sunita Williams. The two have been stranded in space for nine months after their trip on Boeing's malfunctioning Starliner. Officials announced the cancellation during the launch countdown but did not immediately confirm a new launch date.

To replace crew in ISS

NASA had planned to launch a SpaceX rocket from Florida to send a replacement crew to the International Space Station, a mission that would have facilitated the long-overdue return of astronauts Butch Wilmore and Sunita Williams. The two have been stranded in space for nine months following their trip aboard Boeing's malfunctioning Starliner.

The US space agency had accelerated the mission by two weeks after President Donald Trump and SpaceX CEO Elon Musk urged an earlier return for Wilmore and Williams than originally scheduled.

The astronauts, both experienced Navy test pilots, were initially supposed to stay on the ISS for just eight days, but their mission was significantly overrun. Boeing's Starliner capsule, which ferried them to space, returned to Earth last year – without them.

When was Crew-10 supposed to take off?

A SpaceX rocket was set to launch from the Kennedy Space Center in Cape Canaveral at 7.48 pm ET (2348 GMT), carrying a four-member crew consisting of two U.S. astronauts and one astronaut each from Japan and Russia.

NASA confirmed that Butch Wilmore and Sunita Williams remain safe while assisting with research and maintenance on the International Space Station (ISS). In a March 4 call, Williams expressed eagerness to reunite with her family and pet dogs after her extended mission. "It's been a roller coaster for them, probably more so than for us," she said, noting that despite the delay, their work on the ISS remains engaging and fulfilling.

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