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समाचार पत्रों से चयित 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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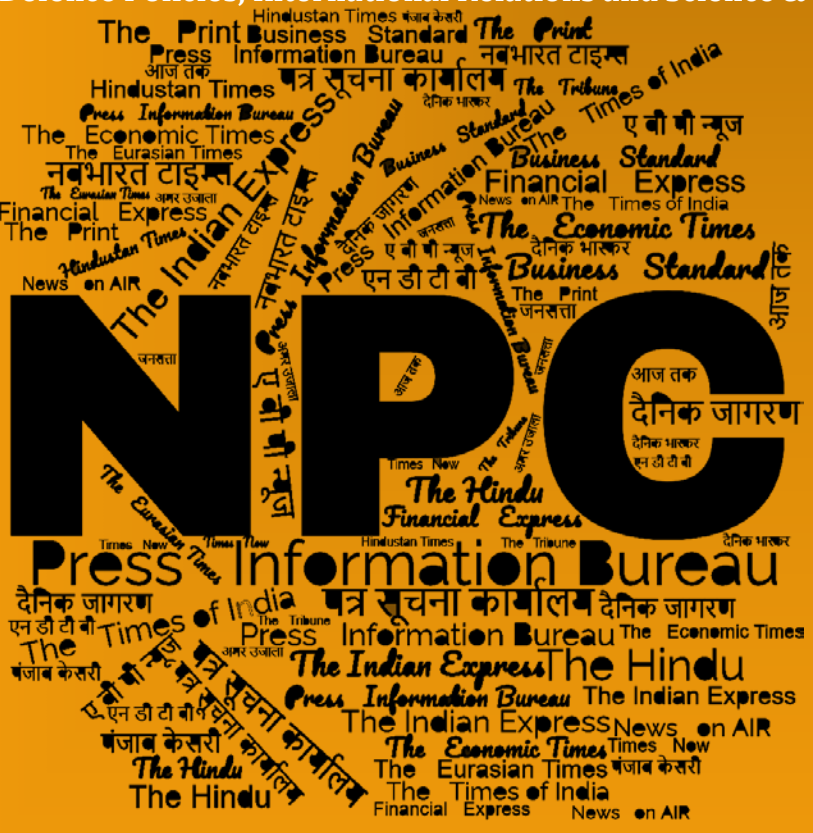

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जनसत्ता

Mon, 06 Feb 2023

कैरियर आईएनएस विक्रांत ने रचा इतिहास, डेक पर पहली हुई जेट लैंडिंग

भारतीय विमानवाहक पोत आईएनएस विक्रांत (INS Vikrant) पर देसी विमान की लैंडिंग की गई। बता दें कि यह अपने आप में मील का पत्थर जैसा कदम है। वहीं भारतीय नौसेना (Indian Navy) ने भी इसे एक ऐतिहासिक उपलब्धि करार दिया है। नौसेना की तरफ से कहा गया है कि उसके पायलट ने विमान को पोत पर सुरक्षित तरीके से उतारा।

भारत की लिए यह लैंडिंग काफी अहम:

नौसेना ने जारी किए गए संक्षिप्त बयान में कहा , "नौसेना के पायलटों द्वारा एलसीए (नेवी) को आईएनएस विक्रांत पर उतारे जाने के साथ भारतीय नौसेना ने आत्मनिर्भर भारत की तरफ एक ऐतिहासिक उपलब्धि हासिल की।" लैडिंग के रक्षा क्षेत्र में भारत की मजबूती बया करने वाला यह कदम देश के लिए काफी अहम माना जा रहा है। बता दें कि एलसीए को आईएनएस विक्रांत पर उतारे जाने से स्वदेशी लड़ाकू विमान के साथ स्वदेशी विमानवाहक पोत डिजाइन , विकसित और निर्मित किये जाने की भारत की क्षमता प्रदर्शित हुई है। वहीं पिछ ले साल सितंबर में प्रधानमंत्री नरेंद्र मोदी (PM Narendra Modi) ने भारत के प्रथम स्वदेश निर्मित विमानवाहक पोत आईएनएस विक्रांत को नौसेना की सेवा में शामिल किया था।

INS विक्रांत की खासियत:

बता दें कि 20,000 करोड़ रुपये की लागत से बने 45,000 टन के आईएनएस विक्रां त को पिछले साल सितंबर में कमीशन किया गया था। यह 262 मीटर लंबा और 62 मीटर चौड़ा है। मालूम हो कि आईएनएस विक्रांत भारत में बनने वाला सबसे बड़ा युद्धपोत है। आईएनएस विक्रांत की अन्य खासियत की बात करें तो यह मिग -29K लड़ाकू जेट और हेलीकॉप्टर सहित 30 विमान ले जा ने में सक्षम है। इस युद्धपोत में लगभग 1,600 के चालक दल को समायोजित किया जा सकता है।

INS विक्रांत का नाम इसके पूर्ववर्ती के नाम पर रखा गया है। जिसने 1971 में बांग्लादेश को आजाद कराने में पाकिस्तान के खिलाफ युद्ध के दौरान महत्वपूर्ण भूमिका निभाई थी। बता दें कि INS विक्रांत का वजन 40 हजार टन है। यह समुद्र के ऊपर तैरता हुआ एयरफोर्स स्टेशन है। इसके जरिए ड्रोन , फाइटर जेट्स, मिसाइलों के जरिए दुश्मनों को निशाना बनाया जा सकता है। आईएनएस विक्रांत से 32 बराक-8 मिसाइल दागी जा सकती हैं।

https://www.jansatta.com/national/indian-navy-ins-vikrant-crosses-milestone-with-first-jet-landing-on-deck/2645525/

THE HINDU

Mon, 06 Feb 2023

In a Major Milestone, Naval Variant of Indigenous Light Combat Aircraft Lands on INS Vikrant

Naval variant of the indigenous Light Combat Aircraft undertakes maiden landing onboard the country's first Indigenous Aircraft Carrier INS Vikrant on February 6

In a major milestone, the Naval variant of the indigenous Light Combat Aircraft (LCA) undertook maiden landing onboard the country's first Indigenous Aircraft Carrier (IAC) INS Vikrant on February 6. This is also the maiden landing of a fixed wing aircraft on the carrier as part of its operationalisation. This was followed by a landing and take-off by a twin-engine MiG-29K fighter jet.

"A historical milestone achieved towards Aatma Nirbhar Bharat by the Navy as Naval pilots carry out landing of LCA [Navy] onboard INS Vikrant," Navy spokesperson Cdr. Vivek Madhwal said. "It demonstrates India's capability to design, develop, construct and operate IAC with indigenous fighter aircraft."Cdr. Madhwal further added: "Indian Navy takes a significant step towards operationalising the IAC by successful landing of MiG-29K on INS Vikrant by naval pilots..."

Post commissioning, efforts are currently under way to operationalise the aviation complex of the carrier after which it would be ready for operational deployment.In January 2020, the Defence Research and Development Organisation (DRDO) had demonstrated a successful arrested landing of Naval Light Combat Aircraft (LCA) on INS Vikramaditya and subsequently, 18 take-offs and landings were conducted in five days. However, the Navy has projected a requirement for a twin-engine aircraft to operate from the carrier and DRDO has now embarked on developing a Twin Engine Deck-Based Fighter (TEDBF) being on the experience of the Naval LCA.

INS Vikrant, displacing a weight of 42,800 tonnes, was commissioned into the Navy last September. The aviation trials are to be carried out post commissioning.The ship powered by four General Electric engines uses an aircraft-operation mode known as Short Take Off But Arrested Recovery (STOBAR) for which it is equipped with a ski-jump for launching aircraft, and a set of three 'arrester wires' for their recovery onboard.

Initially, the carrier would be operating the existing MiG-29Ks in service, while a decision on procurement of an advanced fighter, between the Boeing F/A-18 E/F Super Hornet and the Dassault Aviation Rafale, is expected in the next few months. In the long term, the TEDBF is being developed by the Aeronautical Development Agency (ADA) of the DRDO and is expected to be the mainstay. The project under development is expected to get approval from the Cabinet Committee on Security (CCS) by mid-2023 and could be inducted into the Navy by 2031-32, according to ADA officials as reported by The Hindu earlier.

The TEDBF is envisaged as a twin engine medium weight fighter with an all up weight of 26 tonnes and wing folding.In 2017, the Navy had floated Request For Information (RFI) to procure 57 twin engine carrier fighter which is now set to be downsized to around 26 including few twin seater trainer variants, with the TEDBF in the pipeline.

The Navy had contracted 45 MiG-29K aircraft from Russia for INS Vikramaditya few of which have been lost in crashes and given the availability rates, there won't be enough aircraft to operate from both the carriers.The Naval LCA-Mk1 made its maiden flight in April 2012 from the Shore Based Test Facility (SBTF) in Goa and two prototypes have been flying as part of the development. It is designed with stronger landing gear to absorb forces exerted by the ski jump ramp during take-off, to be airborne within 200m and land within 100m as against 1000m required for normal runways.

https://www.thehindu.com/news/national/in-major-milestone-naval-lca-lands-on-ins-vikrant/article66477098.ece/amp/

Press Information Bureau
Government of India

Ministry of Defence

Mon, 06 Feb 2023

Maiden Landing of LCA Navy and MIG-29k Fighter Aircraft Onboard INS Vikrant

"The successful landing and take off of the indigenous LCA Navy on India's first Indigenous Aircraft Carrier is a momentous step forward towards the realisation of our collective vision of AatmaNirbharBharat. The maiden landing of the Mig-29K also heralds the integration of the fighter aircraft with INS Vikrant. Congratulations to all those who made it happen." - Adm R Hari Kumar, Chief of the Naval Staff.

INS Vikrant is the first indigenous Aircraft Carrier and the most complex warship ever built by our country. It is a matter of pride that the ship has been designed in-house by Indian Navy's Warship Design Bureau and constructed by M/s Cochin Shipyard Limited. The ship had sailed for maiden Sea Trials on 04 Aug 21. Since then, she has undergone sea sorties for trials of Main

Propulsion, Power Generation equipment, Fire Fighting systems, Aviation Facility Complex equipment etc. The Carrier was commissioned into the Indian Navy on 02 Sep 22, the Hon'ble Prime Minister of India, Shri Narendra Modi was the Chief Guest.

The construction of the Carrier is a big boost to the 'AatmaNirbhar Bharat' vision of the Government of India. The Carrier has been undertaking extensive Air Operations with Rotary Wing and Fixed Wing aircraft since 13 Dec 22 towards Air Certification and Flight Integration Trials for achieving the ultimate aim of being 'Combat Ready'. As part of the aviation trials, landing of LCA (Navy) and MiG-29K onboard INS Vikrant was carried out on 06 Feb 23 by Indian Naval Test Pilots.

The landing of LCA(Navy) on deck has demonstrated 'AatmaNirbharta' in India's capability to design, develop, construct and operate indigenous Aircraft Carrier with indigenous Fighter Aircraft. It is indeed a landmark achievement being the first time that trials of a prototype aircraft - indigenously designed & produced by Aeronautical Development Agency (ADA) & Hindustan Aeronautics Limited (HAL), has been successfully undertaken on an indigenous Aircraft Carrier. Further, the landing of MiG-29K onboard INS Vikrant is also a significant achievement as it marks the successful integration of the aircraft with the indigenous carrier as well as further enhances the Combat Readiness of the Navy.

https://pib.gov.in/PressReleasePage.aspx?PRID=1896759

the pioneer

Tue, 07 Feb 2023

Naval LCA: Milestone in Atmanirbhar Bharat

In a major boost to self-reliance in aircraft technology, the indigenously designed and manufactured naval version of the Light Combat Aircraft (LCA) made its maiden landing and take-off from the indigenously built aircraft carrier INS Vikrant on Monday."A historical milestone achieved towards Atmanirbhar Bharat by Indian Navy as naval pilots carry out landing of LCA (Navy) onboard INS Vikrant. Demonstrates India's capability to design, develop, construct and operate indigenous aircraft carrier with indigenous fighter aircraft," the Navy said in astatement.

Prime Minister Narendra Modi last year in September dedicated the INS Vikrant to the nation. The aircraft weighs more than 45,000-tonne and built at a cost of Rs20,000 crore. It can carry 30 aircraft, including MiG-29K fighter jets and helicopters. The warship can accommodate a crew of nearly 1,600. The Navy had said the aircraft carrier would be able to play a role in ensuring peace and stability in the Indo-Pacific region.At present, India has two operational aircraft carriers, including INS Vikrant and Russian built INS Vikramaditya. The landing tests of the LCA at the latter were successfully conducted in 2020.

Once ready for induction, both the aircraft carriers will have one squadron (one squadron has 18-20 jets) each of the LCA on board besides either the F-18 or the naval version of the Rafale fighter jets, besides the Mig-29Ks. While the US manufactures the F-18s, France manufactures the Rafales. The IAF has already inducted all the 36 Rafales into service.As regards the Tejas LCA, the IAF has inducted a batch of Tejas aircraft. Initially, the IAF had placed an order with

the Hindustan Aeronautics Limited for 40 Tejas aircraft.Later, the IAF placed an order to the HAL for the procurement of another batch of 83 Tejas at a cost of over Rs 47,000 crores.

As regards the Vikrant test, sources said LCA naval version is a technology demonstrator. However, the landing and take-off is crucial as it highlights that India has developed niche technologies specific to deck-based fighter operations, and this will pave the way to develop and manufacture the twin-engine deck-based fighter (TEDBF) jets.The flight trials on board INS Vikrant involve the Russian-origin MiG-29K fighter jets that use the ski-jump to take off from the aircraft carrier and are recovered by arrestor wires or what is known as STOBAR (short take-off but arrested recovery) in navy parlance.

Twelve MiG-29Ks are likely to be deployed on INS Vikrant and it will operate a new deck-based fighter that the navy is looking to buy as an interim measure to meet its requirements before the indigenous TEDBF is ready in a few years, the officials said.As the TEDBF will take seven to eight years, the Navy plans to procure 26 F-18s or Rafales to maintain its operational readiness.The Navy is working with the Defence Research Development Organisation (DRDO) and Aeronautical Development Agency on the TEDBF project.

https://www.dailypioneer.com/2023/page1/naval-lca--milestone--in-atmanirbhar-bharat.html

Press Information Bureau
Government of India

Ministry of Defence

Mon, 06 Feb 2023

Prime Minister dedicates to the nation HAL Helicopter Factory - India's largest - at Tumakuru, Karnataka

We have to minimise foreign dependence for our defence needs: Shri Narendra Modi

"With the spirit of 'Nation First', success is assured"

Raksha Mantri Shri Rajnath Singh terms the facility as a testament to India's growing indigenous capabilities & Government's resolve to achieve 'Aatmanirbharta' in defence

Prime Minister Shri Narendra Modi dedicated to the nation Hindustan Aeronautics Limited (HAL) Helicopter Factory at Tumakuru in Karnataka on February 06, 2023. He took a walkthrough of the Helicopter Facility & Structure Hangar and unveiled the Light Utility Helicopter (LUH). The factory is India's largest helicopter manufacturing facility and will initially produce LUHs.The LUH is an indigenously designed and developed three-ton class, single engine multipurpose utility helicopter with unique features of high manoeuvrability. Initially, this factory will produce around 30 helicopters per year and can be enhanced to 60 and then 90 per year in a phased manner.

Addressing the gathering, the Prime Minister said, Karnataka is a land of saints and sages that have always strengthened the Indian traditions of spirituality, knowledge and scientific values. He lauded the talent and innovation of Karnataka's youth and said the manufacturing sector's strength is manifested in products from drones to Tejas fighter planes. "Double-engine government has made Karnataka the first choice of investors," the Prime Minister asserted and illustrated the point by the HAL project dedicated today, for which he had laid the foundation stone in 2016 with a pledge for reducing foreign dependence for defence needs.

The Prime Minister expressed delight that hundreds of arms and defence equipment are being manufactured in India which are being used by the Armed Forces. "From advanced assault rifles to tanks, aircraft carriers, helicopters, fighter jets, transport aircraft, India is manufacturing it all", the Prime Minister remarked. Throwing light on the aerospace sector, the Prime Minister pointed out that the investment made in this sector in the last 8-9 years is five times the investment made before 2014 plus 15 years prior. The Prime Minister underlined that Made in India arms are not just supplied to the armed forces but the defence exports have also grown manifold when compared to the years before 2014. He emphasised that hundreds of helicopters are going to be manufactured in this facility itself in the near future which will give rise to businesses worth Rs four lakh crore. "When such manufacturing units are set up, it does not just strengthen the Armed Forces but also creates employment and self-employment opportunities," Shri Modi remarked as he underlined that small businesses near the helicopter manufacturing facility in Tumkuru will get empowered.

The Prime Minister emphasised that with the spirit of 'Nation First' success is assured. He talked about revamping and reforms in the working of the public sector enterprises as well as opening up opportunities for the private sector.The Prime Minister referred to the recent propaganda to target the government in the name of HAL and said that falsehood, no matter how big, frequent or high, is always defeated in the face of truth. "This factory and the rising strength of HAL has exposed the purveyors of falsehood. Reality is speaking for itself," he said and added that today the same HAL is making modern Tejas for the Armed forces and is a centre of global attraction and bolstering India's 'Aatmanirbharta' in the defence sector.

In his address, the Raksha Mantri lauded the Prime Minister's visionary leadership, saying that it has fuelled the rise of a 'New India' which has the ability to illuminate the world with its light. He stated that India has been a major centre for production and export of silk, cotton & steel and it has now embarked on a journey to become a global hub in manufacturing, especially in the field of defence. He described the HAL Helicopter Factory as a testament to the country's growing indigenous capabilities and the Government's unwavering resolve to achieve 'Aatmanirbharta' in defence manufacturing.

Shri Rajnath Singh also called the inauguration as a tribute to the innumerable heroes and freedom fighters of Karnataka who sacrificed their lives to protect the nation. He added that the facility is a reflection of the Swadeshi movement inspired by leaders like Father of the Nation Mahatma Gandhi. "The Swadeshi movement, which started a century ago, was the first phase of our independence. That was National Movement 1.0. Our vision of 'Aatmanirbhar Bharat' is the second phase. It is National Movement 2.0, through which we are moving fast towards freedom from foreign equipment," he said.

The Raksha Mantri stressed that under the Prime Minister's leadership, the Armed Forces have marched ahead in the defence of the nation with renewed vigour and enthusiasm. Not just the

soldiers, but scientists, engineers, machinists, technicians, MSMEs, individual innovators, start-ups, industrial workers and all other sections are contributing to national security and socio-economic empowerment of the country, he added. Shri Rajnath Singh stated that while the Armed Forces are at the borders, every citizen is behind the scene supporting and encouraging them. The HAL Helicopter Facility is a proof of that collective resolve, he said.

About HAL Helicopter Factory

The Greenfield Helicopter Factory, spread across 615 acres of land, is planned with a vision to become a one-stop solution for all helicopter requirements of the country. After initially producing LUHs, the factory will be augmented to produce other helicopters such as Light Combat Helicopters (LCHs) and Indian Multirole Helicopters (IMRHs). It will also be used for Maintenance, Repair and Overhaul of LCH, LUH, Civil Advanced Light Helicopter (ALH) and IMRH in the future. Potential exports of civil LUH will also be catered to from this factory.

The HAL plans to produce more than 1,000 helicopters in the range of 3-15 tonnes, with a total business of over Rs four lakh crores over a period of 20 years. Besides generating direct and indirect employment, the Tumakuru facility will boost the development of surrounding areas through its CSR activities with large-scale community centric programmes on which the company will spend substantial amounts. All this will result in improvement in the people's lives in the region.The proximity of the factory, with the existing HAL facilities in Bengaluru, will boost the aerospace manufacturing ecosystem in the region and support skill & infrastructure development such as schools, colleges and residential areas. Medical and health care would also reach the community residing in the various nearby Panchayats.

With the establishment of facilities like Heli-Runway, Flight Hangar, Final Assembly Hangar, Structure Assembly Hangar, Air Traffic Control and various supporting service facilities, the factory is fully operational. This factory is being equipped with state-of-the-art Industry 4.0 standard tools and techniques for its operations. This factory will enable India to meet its entire requirement of helicopters without import and giving much needed fillip to the Prime Minister's vision of 'Aatmanirbhar Bharat' in helicopter design, development, and manufacture. Karnataka Chief Minister Shri Basavaraj Bommai, Ministers of the state government and senior officials of Ministry of Defence were among those present on the occasion.

https://pib.gov.in/PressReleasePage.aspx?PRID=1896758

THE HINDU

Mon, 06 Feb 2023

Drones, Tejas Aircraft Show Karnataka's Manufacturing Strength: Modi

Prime Minister Narendra Modi has said that Karnataka's manufacturing sector's strength was exhibited in products ranging from drones to the Tejas fighter aircraft.Mr. Modi, who dedicated the HAL helicopter factory in Tumakuru to the nation and lauded the talent and innovation of the State's youth, said the manufacturing sector's strength is manifested in products from drones to

Tejas fighter planes. He also said that the “double-engine” government has made Karnataka the first choice for investors.

“The double-engine government has made Karnataka the first choice for investors. The double-engine government is paying equal attention to social infrastructure as it is giving to physical infrastructure,” said Mr. Modi who also on the occasion laid the foundation stone for the Tumakuru Industrial Township and two Jal Jeevan Mission projects at Tiptur and Chikkanayakanahalli in Tumakuru.The Prime Minister also highlighted that many defence equipment such as advanced assault rifles, tanks, aircraft carriers, helicopters, fighter jets, transport aircraft are being manufactured in the country which are being used by the Indian armed forces. He also claimed that the investment made in the aerospace sector in the last 8-9 years is five times the investment made before 2014.

Mr. Modi also attacked the Opposition parties for spreading misinformation about HAL in the past and that propaganda to target his government in the name of HAL has failed. “Falsehood, no matter how big, frequent or high, is always defeated in the face of truth. This factory and the rising strength of HAL has exposed those who spread falsehood and wasted the precious time of the Parliament,” said Mr. Modi.In the run-up to the 2019 general elections, the Congress led by then party president Rahul Gandhi had alleged that Mr. Modi was depriving HAL of the Rafale contract and that he was favouring the French aircraft manufacturer Dassault Aviation over the Bengaluru headquartered defence PSU.

On this year’s budget, Mr. Modi said that the budget allocation for Jal Jeevan Mission has seen an increase of ₹20,000 crore from last year and that the biggest beneficiaries of this scheme are women.He also said that ₹5,500 crore has been allocated for the Upper Bhadra Project, which will benefit Tumakuru, Chikkamagaluru, Chitradurga, Davangere and the drought-affected areas of central Karnataka. On millets, he highlighted the emphasis given on the production of millets in this year’s Budget and said that it will greatly benefit the small farmers of Karnataka.

Defence Minister Rajnath Singh on the occasion said that the self-reliant India campaign is the second phase of independence as the country was moving away from dependence on foreign equipment by manufacturing its own. “If the freedom struggle was national movement 1.0, then the self-reliant India campaign is national movement 2.0,” said Mr. Singh.

https://www.thehindu.com/news/national/karnataka/drones-tejas-aircraft-show-karnatakas-manufacturing-strength-modi/article66478316.ece/amp/

THE ECONOMIC TIMES

Mon, 06 Feb 2023

HAL Success 'Exposes those Who Lied about Rafale Offsets and Wasted House Time': PM Modi

The success of state-owned Hindustan Aeronautics Limited (HAL) has exposed lies and false allegations levelled by the opposition that wasted hours of parliament time, Prime Minister Narendra Modi has said, referring to the Congress-led charge on the Rafale fighter jet deal that rocked the two houses prior to the 2019 national elections.Taking on the opposition over

allegations it made that the Rafale deal favoured the private sector and took away work that would have gone to HAL, the prime minister said that the rising strength of the state-owned entity and execution of orders for fighter jets and helicopters has exposed lies and misinformation.

"HAL was used as an excuse to level false allegations against the government. A conspiracy was launched to use its name to provoke people that wasted hours and hours of parliament time. (But) no matter how big the lie is, how many times it is repeated and who ever makes it, it loses in front of the truth one day," the prime minister said.He was speaking at a ceremony to dedicate India's largest helicopter manufacturing facility in Karnataka's Tumakuru on Monday. The PM said that the HAL facility will generate business worth over Rs 4 lakh crore in the coming years and will supply a variety of helicopters to the armed forces. The foundation stone of the factory was laid by PM Modi in 2016.

"HAL's new factory and growing prowess is exposing several old lies, and those who made the false allegations. Reality is speaking. The very same HAL is making modern Tejas (fighter jets) and strengthening India's self-reliance in the defence sector," the PM said.Twisting the knife, the PM also referred to investments in the aerospace sector, saying they have gone up multifold since his government came into power. "In the 15 years before 2014, whatever investment happened in aerospace sector, five times of that has happened in the last 8 to 9 years," he said, adding that defence exports have also gone up several times since 2014.

Referring to Karnataka that has been India's aviation hub, the PM said that the state now has the capability to manufacture a variety of systems, from drones to fighter jets. He credited the 'double engine government' of BJP and the Centre and the state for making Karnataka the first choice for investors.Later in the day, Congress' Chief Spokesperson Jairam Ramesh said, "Modi claims HAL was used by Congress to target him. Truth is, the UPA Rafale deal ensured HAL manufactures 108 jets with transfer of technology, but Modi bypassed HAL & simply bought 36 jets from France."

https://economictimes.indiatimes.com/news/politics-and-nation/hal-success-exposes-those-who-lied-about-rafale-offsets-and-wasted-house-time-pm-modi/articleshow/97664708.cms

अमर उजाला

Tue, 07 Feb 2023

अब दुश्मनों के रडार से बच सकेंगे जल और थल पर चलने वाले सैन्य वाहन, आईआईटी मंडी ने किया शोध

देश की सैन्य शक्ति को मजबूत करते हुए भारतीय प्रौद्योगिकी संस्थान (आईआईटी) मंडी के शोधकर्ताओं ने एक ऐसी तकनीक का आविष्कार किया है , जिससे जल, थल पर चलने वाले घातक सैन्य वाहन और खुफिया ठिकाने दुश्मनों के रडार की नजर में नहीं आ पा एंगे। वैज्ञानिकों ने एक ऐसी मटीरियल तकनीक बनाई है, जिसकी परत चढ़ाने से वाहन या खुफिया ठिकाने अत्याधुनिक रडार को भी चकमा देने में सक्षम होंगे।

यह मटीरियल रडार फ्रीक्वेंसी (सिग्नल) की बड़ी रेंज को एब्जॉर्व करने में सक्षम होगा , चाहे रडार के सिग्नल किसी भी दिशा से ऑब्जेक्ट को कवर करना चाहे। स्कूल ऑफ कंप्यूटिंग एंड इलेक्ट्रिकल इंजीनियरिंग के सहायक प्रोफेसर डॉ. श्रीकांत रेड्डी, डॉ. अवनीश कुमार और डॉ. भूषण पाधी ने मिलकर यह खोज की है। इस शोध कार्य के निष्कर्ष आईईईई लेटर्स ऑन इलेक्ट्रोमैग्नेटिक कम्पैटिबिलिटी प्रैक्टि स एंड एप्लीकेशन नामक जर्नल में प्रकाशित किए गए हैं।

फ्रीक्वेंसी सेलेक्टिव सर्फेस के आधार पर विकसित की तकनीक

आईआईटी मंडी के डॉ . जी श्रीकांत रेड्डी ने इस शोध के बारे में बताया कि शोधकर्ताओं ने ऐसा आर्टिफिशियल स्ट्रक्चर/मटीरियल तैयार कर लिया है, जो हमारे खुफिया सैन्य वाहनों और खुफिया ठिकानों को दुश्मनों के रडार की नजरों से बचा सकता है। इसका उपयोग खुफिया सैन्य वाहनों और खुफिया सैन्य ठिकानों की खिड़कियों या कांच के पैनलों को सुरक्षा कवच देने के लिए भी किया जा सकता है , जिनका रडार की नजर से बचना जरूरी है। इस टेक्नोलॉजी का विकास फ्रीक्वेंसी सेलेक्टिव सर्फेस (एफएसएस) के आधार पर किया है , जो रडार द्वारा उपयोग किए जाने वाली फ्रीक्वेंसी की बड़ी रेंज को एब्जार्व करती है जिसके परिणामस्वरूप यह सर्फेस रडार को नहीं दिखता है।

सैन्य ही नहीं, सार्वजनिक क्षेत्रों में भी उपयोग होगा शोध

रडार का उपयोग सैन्य ही नहीं बल्कि यह सार्वजनिक क्षेत्रों में भी निगरानी और नेविगेशन के लिए किया जाता है। डा. अवनीश ने बताया कि इससे विमानों , जल जहाजों, जमीन पर चलने वाले वाहनों और गुप्त ठिकानों में होने वाली गतिविधियों का पता चलता है। रडार की नजरों से बचना सैन्य सुरक्षा की अहम रणनीति है और रडार से बच कर निकलने की क्षमता हो तो दुश्मन के हथियारों का निशाना बनने का खतरा कम हो सकता है। रडार की नजरों से बचाने की तकनीक व्यावसायिक क्षेत्र की इमारतों से रेडियेशन का खतरा कम करने और उनकी सुरक्षा बढ़ाने में भी उपयोगी हो सकती है। उदाहरण के लिए रडार के लिए अदृश्य हो जाने की क्षमता का उपयोग निजी या खुफिया जगहों की जानकारी और गोपनीयता सुरक्षित रखने में भी किया जा सकता है।

ऐसे काम करेगी तकनीक

डा. भूषण का कहना है कि इस डिजाइन में ऑप्टकली ट्रांसपरेंट आईटीओ -कोटेड पी ईटी शीट का उपयोग किया गया है। इस पीईटी शीट पर एफएसएस पैटर्न बनाए जाते हैं। पीईटी शीट पर लेजर इन्ग्रेविंग टेक्नोलॉजी से एफएसएस पैटर्न बनाए गए और सिमेट्रिकल और ग्लॉसी होने के कारण यह एब्जार्वर पोलराइजेशन इंसेंसिटव हो जाता है। यह सी , एक्स और क्यू बैंड में ईए म तरंगों की फ्रीक्वेंसी की बड़ी रेंज को एब्जार्व कर लेता है। इस संबंध में विभिन्न परीक्षणों से यह तथ्य सामने आया है कि एफएसएस टेक्नोलॉजी फ्रीक्वेंसी की बड़ी रेंज में 90 प्रतिशत से अधिक रडार वेव्स एब्जार्व करने में सक्षम है। शोधकर्ताओं की टीम ने इस डिजाइन के कई प्रायोगिक अध्ययन किए और प्राप्त परिणाम सैद्धांतिक विश्लेषण के अनुरूप पाए गए जो इसके प्रभावी होने की पुष्टि करते हैं।

https://www.amarujala.com/shimla/now-deadly-military-vehicles-will-be-able-to-escape-from-enemy-s-radar-iit-mandi-invented-new-technology-2023-02-06

THE ECONOMIC TIMES

Mon, 06 Feb 2023

Indian Researchers Develop New Tech to Make Military Equipment Invisible to Radar

In a significant achievement, Indian reserchers have able o develop a material that can make stealth vehicles and covert establishments less visible to the radar. Radars are used in defence and civil sectors for surveillance, and navigation, to detect and track aircraft, ships, ground vehicles, and movements within covert establishments.The material can absorb a wide range of radar frequencies (signals), irrespective of the direction from which the radar signal hits the target, said the team of researchers at the Indian Institute of Technology (IIT), Mandi, which has developed the technology. According to it, it can also be used to cover windows or glass panels of stealth vehicles and covert establishments that must be invisible to radar.

The research has been published in the journal "IEEE Letters on Electromagnetic Compatibility Practice and Applications"."Being invisible to radar is a crucial defence strategy and the ability to evade radar detection can reduce the chances of being targeted by enemy weapons," explained Shrikanth Reddy, Assistant Professor, School of Computing and Electrical Engineering, IIT Mandi."Any technique that makes things invisible to radar can also be used in the commercial sector to reduce radiation leakages from buildings and make them more secure. For example, invisibility to radar can also be used in private or covert establishments for the protection of information and privacy," he said.

Radar Cross Section (RCS) reduction is a way to make something less visible to radar. RCS reduction is achieved by using materials that can absorb radar signals, or by shaping the object in a way that makes it difficult for radar to detect."We have developed a technology based on Frequency Selective Surface (FSS) that absorbs a wide range of frequencies used in radar, which makes the surface invisible to radar," Reddy explained.The proposed design uses an optically transparent Indium Tin Oxide (ITO)-coated Polyethylene terephthalate (PET) sheet. The FSS patterns are created on this PET sheet.PET sheet is a common thermoplastic that provides high dimensional stability, excellent mechanical strength and good resistance.

The researchers created FSS pattern on the PET sheet with the laser engraving technology. Due to symmetrical and lossy nature of these patterns, the proposed material absorbs a wide range of electromagnetic (EM) wave frequencies within C (4-8 GHz), X (8-12 GHz) and Ku (26-40 GHz) Band.Tests showed that this technology can absorb more than 90 per cent of the radar waves in a wide range of frequencies.The team performed experimental studies on their design and the results matched well with the theoretical analysis, verifying its effectiveness."This technology can be used on window or glass panels of stealth vehicles and covert establishments due to its optical transparent nature," Reddy said."The team has already developed a prototype and the results have been published in IEEE Journal. This technology has potential applications for RCS reduction and absorption of unwanted radiation leakages," he added.

https://m.economictimes.com/news/defence/indian-researchers-develop-new-tech-to-make-military-equipment-invisible-to-radar/amp_articleshow/97654345.cms

The Statesman

Tue, 07 Feb 2023

Defence Spending a Part of National Development

By Harsha Kakar

Addressing passing out cadets of the Indian Military Academy in December 2006, then President Abdul Kalam stated, "National security is born out of two important components. One is the economic growth and prosperity; second one is the capability to defend the nation against all types of threats." The economy provides funds for national security while national security provides an environment for national growth. There is a strong corelation between the two. Simultaneously, there has to be a balance between development and security.

Addressing a seminar in February 2018, General Bipin Rawat stated, "Economic rise takes place if the country is secure. We have to build and develop confidence amongst investors that the nation's borders are secure and internal security situations being under control for which there is a requirement for budget for the defence forces. Economic development and military modernisation must go hand-in-hand." He also emphasized the role of armed forces in building the economy. He mentioned that 35-37 per cent of the annual budget given to the forces contributes towards nation building including in developing infrastructure.

There is no doubt that budget allocations will never be sufficient or equal to demands being projected by the forces. However, they need to be realistic. In the budget this year, defence was allocated Rs 5.94 lakh crore, which was under 2 per cent of the GDP and just over 13 per cent of government spending. It is low if suggestions of multiple parliamentary panels are considered. They have repeatedly demanded 2.5 per cent of the GDP. This allocation includes Rs 1.38 lakh crore for pensions as compared to Rs 1.19 lakh crore last year. The increase is due to OROP announced recently.

The revenue share of the budget, earmarked for maintenance and sustenance of forces has witnessed the largest hike rising to Rs 90,000 crore from just under Rs 65,000 crore last year. The defence ministry stated that this was to close critical gaps in combat capabilities and meet demands of ammunition, sustenance of assets etc. This part of the budget would enable upgrading existing capabilities, create essential reserves as also develop infrastructure for troops in regions where Chinese salami slicing threats are more likely.

The defence capital outlay was increased to Rs 1.72 lakh crore, which is just about Rs 10 lakh crore over last year, an increase of approximately 16 per cent. Of this the air force obtained the highest share of Rs 0.57 lakh crore, a marginal increase of 3.6 per cent from last year, the army Rs 0.37 lakh crore, an increase of 15.5 per cent and the navy Rs 0.52 lakh crore, an increase of 10.5 per cent. There is no mention of allocation to joint organizations including cyber, space, strategic forces and special forces commands, which would flow from individual service allocations.

Capital allocations were way below what the forces had demanded, though this was not unexpected considering economic hurdles post the Ukraine conflict. Further this budget was an election year budget intending to grant sops. Overall the government spending was at a record high and hence capital allocation should have proportionately risen.

Currently there are multiple ongoing projects of the forces which may be impacted by reduced allocations. The navy seeks approval for a third aircraft carrier, additional submarines and aircraft for its second aircraft carrier. The air force has committed liabilities including for its newly inducted Rafale and the S 400 as also seeks to finalize its choice of additional fighters to replace its aging fleet and enhance its squadron strengths. The army intends to boost its artillery firepower and induct drones to support troops deployed along un-demarcated borders.

A major increase has been in allocation to the Border Roads Organization, which has enhanced connectivity along the LAC. Last year its allocation of Rs 3500 crore was 40 per cent higher than the previous year, whereas this year it was enhanced to Rs 5000 crore. This sends a clear message to China that despite all their objections India is revamping its infrastructure. There have also been increased allocations for supporting innovations and encouraging technology development in the private sector.

As per reports the armed forces had surrendered Rs 2,400 crore from its capital budget last year. The government must re-consider implementing the long-term demand and recommendation of a rolling budget or non-lapsable fund. With increasing threats and reduced allocations such an action would prevent forces from depositing additional funds with government undertakings for future orders. They would also not be compelled to expend in a rush.

Capability development is a timeconsuming process as also demands for equipment placed currently would take years to fructify. Added to delays is the concept of make in India, where any global concern obtaining the contract has to commit to manufacturing a large part of the order locally. All this gets impacted when capital budgets are low. With maximum share of the capital and revenue budget being spent locally, defence is no longer a white elephant but a contributor to national economic development.

Inter-service allocations made by the finance ministry remain illogical. Capability development must be based on threat perceptions and a National Security Strategy (NSS). With a NSS lacking, it is the office of the CDS which is entrusted with joint capability development. Thus, logically, the finance ministry must allocate broad figures and let the Department of Military Affairs under the CDS to further sub-allocate based on emerging threats and essential capabilities.

Simultaneously, the government talks of ‘downsizing and not rightsizing.’ This implies infusion of technology to reduce manpower. This can only happen if budgets are sufficient. Even within the services there is scant regard for sharing resources. An example is each service seeking its own predator UAVs, most of which will be employed for similar tasks. Also important is creation of a central logistics corps reducing multiple supply chains in a theatre.

Finally, the services must understand that this is approximately the share of the budget they would receive. Thus, they need to consider its best utilization thereby obtaining the best bang for the buck. The national budget is simultaneously a message to adversaries. The more powerful the allocation for capability development the more determined the nation is towards facing its threats. The government must realize that the armed forces, apart from ensuring national security, are also engines for national growth and development.

https://www.thestatesman.com/opinion/defence-spending-a-part-of-national-development-1503152851.html

Mon, 06 Feb 2023

As India's $3bn Weaponised Drones Purchase Speeds Up, US Defence Conglomerate Plans 'Long-Term' Ties

With India's $3 billion deal to purchase 30 MQ-9B Predator drones from US' defence conglomerate General Atomics gaining momentum, the company is eyeing a "long-term relationship" with New Delhi, supporting the government's 'Atmanirbhar', or self-reliance, programme in the defence sector, according to the firm's Chief Executive Vivek Lall.

In an exclusive interview to ABP Live ahead of 'Aero India 2023', Lall, Chief Executive, General Atomics Global Corporation, said: "We understand that the MQ-9B acquisition program is at an advanced stage of discussion between the U.S. and India governments. General Atomics stands ready to support India and we value our long-time relationship."

Last year, India had expressed its intention to acquire these weaponised unmanned aerial vehicles for all three services — Army, Navy and Air Force — in an effort to strengthen its presence and boost surveillance in sensitive sectors of the Line of Actual Control (LAC) with China as well as in the maritime domain as the country increases presence of its military in the Indian Ocean region.

"MQ-9B would enable its Indian military users to fly farther than anything else in this category, spend more time in the air and handle a greater diversity of missions than any other similar aircraft," Lall said, adding that the model that has been selected for the Indian market is the "most advanced" version.

While the deal, which is being negotiated under the Foreign Military Sales (FMS) route of the US, has gained speed, the Defence Acquisition Council (DAC) chaired by Defence Minister Rajnath Singh is yet to give the project a green signal. The deal was discussed in details during the last India-US 2+2 meeting held in April 2022 in Washington DC.

"The model being proposed to India is the MQ-9B, which is our most advanced line of remotely piloted aircraft, highlighted by their all-weather performance, unsurpassed endurance and it's built for flight in unsegregated airspace," Lall said in an emailed response.

He added that the 'SkyGuardian' and 'SeaGuardian' — both variants of MQ-9B — can deliver full-motion video in virtually any conditions, day or night, as well as other kinds of detailed sensing with their onboard systems.

A 'SkyGuardian' becomes a 'SeaGuardian' when it carries a 360-degree maritime search radar that gives users a quality of maritime domain awareness.

"The aircraft also can carry a wide variety of specialist payloads if they must adopt to a specific mission… Artificial intelligence, machine learning and other sophisticated technologies help unlock the rich feed of insight from these aircraft, analyze it and distribute it to those who need it to take quick decisions," he said.

It was the Indian Navy that first started using two Predator drones in November 2020, based on a lease agreement with General Atomics.

Lall also stressed that apart from intelligence, surveillance or military systems, these drones also carry other forms of payloads, including communications relays, that enables it to act as a node connecting forces operating in land and sea at the same time.

"These aircraft can conduct search and rescue, help fight wildfires, support customs authorities, augment naval forces and take many other tasks … The MQ-9B is the premier multi-role, long endurance remotely piloted aircraft in the world today. It is in high demand. Japan, Belgium, Great Britain, and several other nations are flying or are on track to begin flying them," he said.

The company has also entered into a strategic partnership with Bharat Forge to manufacture the unmanned aerial vehicles in India.

Supporting 'Atmanirbhar' In Defence, Tie-Ups In Critical Tech

Eyeing long-term growth potential in the Indian market, the California-based defence firm is keen on supporting the government's 'Atmanirbhar' or self-reliance programme in the defence sector.

"General Atomics has enthusiastically embraced the Atmanirbhar initiative … General Atomics is committed to Indian Prime Minister Modi's 'Make in India' strategy and we're looking forward to much more cooperation with Indian companies as we move forward," said Lall.

The company is now foraying into the segments of artificial intelligence and semiconductor technology in India.

"In addition to our partnership with Bharat Forge that we announced in early January, we've had announcements about our work with 3rdiTech for semiconductor technology, and 114ai for Artificial Intelligence. I expect more partnerships to grow between General Atomics and Indian industry in the weeks and months to come," he said.

Lall added: "We are looking forward to increased cooperation on NextGen AI technologies that we have been working on with the team at 114ai for the last few months. Their technology, track record and tenacity with customers in the U.S. and U.K. has stood out. We expect many world-leading products coming out of this partnership."

In the semiconductor segment, the company has tied up with 3rdiTech that is also a defence startup like 114ai.

Last week, National Security Advisor Ajit Doval and his American counterpart Jake Sullivan held the first round of the 'US-India Initiative on Critical and Emerging Technology', or iCET, in an effort to upgrade the strategic partnership between both countries.

Doval is believed to have discussed the drones deal with the US during his visit to Washington DC where he also met US Secretary of State Antony J. Blinken, Chairman of the Joint Chiefs of Staff General Mark Milley and Acting Secretary of Defense Kathleen Hicks.

https://news.abplive.com/india-at-2047/as-india-s-3-billion-weaponised-mq-9b-predator-drones-purchase-speeds-up-us-defence-conglomerate-general-atomics-plans-long-term-ties-1580398

FINANCIAL EXPRESS
Read to Lead

Mon, 06 Feb 2023

India and US Progress on Guardian MQ9B Deal Given Chinese aggression

By Huma Siddqui

The world's top platform for armed ISR (intelligence, surveillance, and reconnaissance) capability, Guardian MQ9B from General Atomics (GA), which is not available to even countries like Ukraine from the US, is progressing through the government to government Foreign Military Sale (FMS) discussion route. The lethal platform has had great success in ISR operations and armed conflict and enabled for export to only the very closest US partners. This would be the first platform with cutting edge US ISR technology incorporated into the Indian arsenal. It is also the first time that all three services will exhibit jointness with a platform as all three will take deliveries of these assets and collaborate on induction and operation which has been a goal of Indian military planners and top political leadership in New Delhi.

Government sources in New Delhi indicate that this is an urgent requirement and rare capability made available to India and they hope to close the deal soon. With manufacturing and high technology tie-ups in place between General Atomics and Indian companies, the drone ecosystem which is the vision of Prime Minister Narendra Modi has a lot to gain said sources.

There are a series of high level engagements planned between both governments. US Secretary of State Anthony Blinken will be visiting Delhi in early March for the G20 Foreign Ministers meeting. Prime Minister Modi and President Joe Biden will be meeting at the Quad meeting in Australia (expected to take place in May) and there is talk of a potential Prime Minister Modi visit to the US this summer. President Biden is expected to visit India as part of the G20 in September this year. Expectations are high from both sides that this long standing requirement of India for armed ISR will fructify this year.

Who is Dr Vivek Lall?

Dr Vivek Lall a world renowned aerospace scientist and Chief Executive of General Atomics Global Corporation who recently was given the Lifetime Achievement award by President Biden in US and a "Jewel of India" felicitation presided by 14th President of India Ram Nath Kovind, has been instrumental in bilateral cooperation at various levels in the last two decades. He announced tie ups with Bharat Forge, 3rd itech and 1114ai so far with more expected.

More about the Tie-ups

General Atomics Global Corporation, a major American energy and defense company, has revealed plans for three major projects in India aimed at advancing artificial intelligence, unmanned aerial vehicles and semiconductors. The move follows the launch of the India-US initiative on critical and emerging technologies.

Financial Express Online has reported General Atomics Aeronautical Systems has partnered with Bharat Forge, a top Indian forging company, for aerostructure manufacturing. The company has also teamed up with 114ai, an Indian AI firm, to develop cutting-edge AI technologies. The

partnerships were announced by Dr Vivek Lall, Chief Executive of General Atomics Global Corporation.

In addition to its partnerships with Bharat Forge and 114ai, General Atomics has entered into a strategic alliance with 3rdiTech, an Indian semiconductor start-up. Dr Lall emphasized the importance of semiconductors in the modern technology landscape and highlighted the significance of the partnership with 3rdiTech as representing "the new India under Prime Minister Modi's leadership."

He stated General Atomics' commitment to supporting Prime Minister Modi's vision of an Atmanirbhar Bharat and said that the partnerships marked a "big step in the right direction." The company is aligned with the government's "Make in India" strategy and looks forward to further cooperation with Indian firms.

The US Semiconductor Industry Association and the India Electronics Semiconductor Association, in partnership with the Indian Government Semiconductor Mission, have established a task force to evaluate industry prospects and encourage the development of complementary semiconductor ecosystems in India. Last week Financial Express Online reported that the White House has said the task force will provide recommendations on workforce development, R&D and exchange opportunities that would benefit both nations.

https://www.financialexpress.com/defence/india-and-us-progress-guardian-mq9b-deal-given-chinese-aggression/2972487

THE HINDU

Tue, 07 Feb 2023

Foreign Secretary Kwatra Attends Meeting in Paris on India-France-UAE cooperation

Foreign Secretary Vinay Mohan Kwatra attended a meeting in Paris on cooperation among India, France and the UAE in areas of defence, energy and environment under a trilateral framework.

Mr. Kwatra is on a visit to France from February 5 to 7.

The Ministry of External Affairs (MEA) said he participated in the 'Focal Points' meeting of the India-France-UAE trilateral dialogue, launched in September last year by the Foreign Ministers of the three countries.

The three countries on February 4 unveiled an ambitious roadmap for cooperation in a plethora of areas, including defence, energy and technology, under the trilateral framework.

The roadmap was finalised during a phone conversation among External Affairs Minister S Jaishankar, his French counterpart Catherine Colonna and UAE's Sheikh Abdullah bin Zayed Al Nahyan. A joint statement was issued following the telephonic talks.

The MEA said as a follow up to the roadmap adopted by the Foreign Ministers, there was discussion on practical steps to take forward cooperation in areas of defence, energy and environment, innovation and people-to-people exchanges.

"They agreed to remain in touch and regularly review progress on the trilateral roadmap," it said in a statement.

https://www.thehindu.com/news/national/foreign-secretary-kwatra-attends-meeting-in-paris-on-india-france-uae-cooperation/article66479146.ece/

Hindustan Times

Mon, 06 Feb 2023

Russian Envoy Questions US Reliability as India's Defence and Strategic Partner

Russian ambassador Denis Alipov on Monday questioned the US's reliability as a partner for India, both for defence supplies and on strategic issues such as the standoff with China, while emphasising the "trusted" relationship forged by Moscow and New Delhi because of similar approaches to global issues"

Alipov, who was speaking at an event marking the 30th anniversary of the Indo-Russian Friendship Treaty of 1993, accused the US of exploiting "contradictions" between India and China and of using a "divide and rule tactic". He also acknowledged that India-Russia relations were "under stress" in the wake of the Ukraine conflict.

The event marked a rare public outing for Alipov, who took up his position early in 2022. India has refrained from publicly criticising Russia's invasion of Ukraine, though Prime Minister Narendra Modi told President Vladimir Putin during a meeting last year that this was not the era of war.

Alipov said Russia does not "mix technology transfer with politics" in the context of defence cooperation with India. "Sometimes it's amusing to read about the US boasting [about] its defence cooperation with India, as if it offers something exclusive. Nothing near the level of advanced technology transfers we do offer," he said.

The licenced production in India of T-90 tanks, SU-30MKI combat jets and AK-203 assault rifles comply with self-reliance initiatives, and the delivery of the third battery of S-400 air defence systems "will be completed in the very near future", he said.

India and Russia signed the $5.4-billion deal for five S-400 batteries in 2018, and all deliveries were to be completed in a five-year period.

In an apparent reference to remarks by senior US officials that close defence and strategic ties with India were not possible during the Cold War era, Alipov said India and Russia had "always been on the same page", which contrasted with the US approach to India.

"Unlike them, we don't need to explain to each other and to the world that close partnership between us was not possible in the past for some reason. One can easily assume that tomorrow it may again be impossible for another [reason], say if the US finds a new rapprochement with China or India manages to mend relations with Beijing. That from the US perspective will be a disaster," he said.

The US, he said, actively exploits contradictions between India and China and promotes the "new paradigm of democracies vs autocracies". Russia and India do not support the "old divide and rule tactic", he added.

Responding to questions after his speech, Alipov sought to play down suggestions that the new "unlimited partnership" between Russia and China could impact his country's relations with India. He said Russia will do the "utmost to facilitate" the normalisation of relations between India and China, which have been locked in a border standoff since May 2020.

"We hear a lot of discussions about India's concerns about the close Russia-China relations at the current stage...There is this widespread opinion that we have become a junior partner to China...Frankly, we have never been a junior partner to anyone in our history...we have a very close cooperation with China...but will never be superseded [and become] a junior partner to China or anyone else," he said.

Russia would like to see the normalisation of India-China relations as this will benefit global and Asian security. "We understand there are very serious impediments to that, a very serious border problem between the two countries...But the sooner there is a normalisation between the two countries, the better for the whole world. We will do the utmost to facilitate if our efforts are needed and are invited," he said.

Asked if India could play any role in mediation to end the war in Ukraine, Alipov said: "We are open to any serious talks on ending it diplomatically. At the moment, there are none. If India wants to take a more active part in that, we will certainly listen to India very closely and we will examine all the proposals in a very serious manner."

While acknowledging that Russia wants to expand its economic presence in Pakistan, Alipov said: "We have maintained consistently that we will never do anything detrimental to India in our relations with Pakistan." He said Russia has a limited defence relationship with Pakistan that is directed towards counter-terrorism. "We don't feel like a weak Pakistan would be a better choice for the region, for India or for Afghanistan," he added.

https://www.hindustantimes.com/india-news/russian-envoy-questions-us-reliability-as-india-s-defence-and-strategic-partner-101675696659070-amp.html

दैनिक भास्कर

Mon, 06 Feb 2023

चीन ने भारत में भी भेजा था गुब्बारा हथियार: अमेरिका को डर- परमाणु हमले के लिए खुफिया टेस्टिंग कर रहा चीन

डिफेंस एक्सपर्ट्स का मानना है कि ऐसे गुब्बारे का मकसद मौसम की जानकारी जुटाना या सिर्फ जासूसी करना नहीं है। हो सकता है कि चीन परमाणु हमले के लिए कोई नया तरीका ईजाद कर रहा हो। अमेरिका के डिफेंस एक्सपर्ट एचआई सटन के मुताबिक, ऐसा ही एक गुब्बारा जनवरी 2022 में भारत के ऊपर भी मंडरा चुका है।

चीन के जासूसी गुब्बारे को 28 जनवरी को अमेरिकी एयरपोर्ट जोन में दाखिल होते हुए देखा गया था । इसके बाद वह 3 फरवरी को मोटांना क्षेत्र में उड़ता दिखा। यह अमेरिका का एक न्यूक्लियर मिसाइल क्षेत्र है। सेना को शक था कि गुब्बारे से चीन जासूसी कर रहा है। इसके बाद से उस पर नजर रखी जाने लगी।

इसके बाद शनिवार दोपहर को राष्ट्रपति जो बाइडेन ने बैलून को मार गि राने का आदेश दिया। इसके बाद उस बैलून के ऐसे इलाके में आने का इंतजार किया गया जिससे उसे गिराए जाने पर लोगों को कोई खतरा न हो।

फिर कैरोलिना कोस्ट से 6 मील की दूरी पर सभी तरह के एयर ट्रैफिक को बंद कर दिया गया है। जब बैलून 60 से 65 हजार फीट की ऊंचाई पर उड़ रहा था, उस दौरान अमेरिका के एक F-22 फाइटर जेट ने मिसाइल हमले से चीन के जासूसी गुब्बारे को मार गिराया।

आसानी से रडार की पकड़ में क्यों नहीं आता जासूसी गुब्बारा?

जिस जासूसी गुब्बारे की बात हो रही है उसका इतिहास दूसरे विश्व युद्ध से जुड़ा है। जापानी सेना ने दूसरे विश्व युद्ध के दौरान गुब्बारे के जरिए अमेरिका में आग लगाने वाले बम लॉन्च किए थे।

कैप्सूलनुमा ये गुब्बारे कई वर्ग फीट के होते हैं। जैसे चीन का जासूसी गुब्बारा 120 फीट चौड़ा और 130 फीट लंबा था।

इन गुब्बारों में हीलियम गैस होने की वजह से ये आमतौर पर जमीन से 37 किलोमीटर की ऊंचाई पर उड़ने की क्षमता रखते हैं। इसी वजह से इनका इस्तेमाल मौसम से जुड़ी जानकारी जुटाने के लिए किया जाता रहा है। ऊंचाई पर उड़ने की क्षमता के कारण इनसे जासूसी भी की जाती है। साथ ही यह रडार के पकड़ में भी नहीं आते।

अमेरिकी एयरफोर्स के एयर कमांड और स्टाफ कॉलेज की 2009 की एक रिपोर्ट के अनुसार, सैटेलाइट के मुकाबले जासूसी गुब्बारे बड़े इलाकों को करीब से स्कैन करने की क्षमता रखते हैं। साथ ही इनमें टारगेट क्षेत्र में ज्यादा समय बिताने की क्षमता होती है।

अमेरिका के लिए चीन का यह गुब्बारा खतरा क्यों था?

चीन का यह जासूसी गुब्बारा शुक्रवार को अमेरिका के मोंटाना शहर से 60 हजार फीट की ऊंचाई पर उड़ रहा था। इस क्षेत्र में एयरफोर्स की मिसाइलों और बैलिस्टिक मिसाइल की विंग है। इसके अलावा इसने अमेरिका की व्योमिंग न्यूक्लियर मिसाइल साइट और नॉर्थ डकोटा न्यूक्लियर मिसाइल साइट के पास से भी उड़ान भरी।

पेंटागन ने कहा कि जासूसी गुब्बारे का रास्ता उसे मोंटाना के ऊपर ले गया था, इससे डर पैदा हुआ कि यह परमाणु मिसाइल साइटों की खुफिया जानकारी इकट्ठा कर रहा था।

चीन ने शुक्रवार सुबह दावा किया कि यह एक सिविलियन गुब्बारा है , जिसका इस्तेमाल मौसम की जानकारी जुटाने के लिए किया जाता है , लेकिन कई घंटे बाद पेंटागन में ब्रिगेडियर जनरल पैट्रिक राइडर ने कहा कि हम जानते हैं कि यह एक जासूसी गुब्बारा है।

एक्सपर्ट कहते हैं कि चीन ने इस गुब्बारे के जरिए संदेश दिया है कि वह अमेरिका के अंदर तक घुसक र जासूसी कर सकता है। राजारत्नम इंटरनेशनल स्टडीज स्कूल सिंगापुर के बेंजामिन हो का कहना है कि चीन दिखाना चाहता है कि वह अमेरिका से पीछे नहीं है। इससे चीन में राष्ट्रपति शी जिनपिंग की साख जनता के बीच बढ़ेगी।

खतरे का अंदाजा आप इस बात से भी लगा सकते हैं कि इस गु ब्बारे की वजह से अमेरिका के विदेश मंत्री एंटनी ब्लिंकन ने अपना चीन दौरा रद्द कर दिया है। वो रविवार से 2 दिन के चीन दौरे पर जाने वाले थे।

क्या इस गुब्बारे में परमाणु बम रखकर ले जाया जा सकता है?

डिफेंस एक्सपर्ट ने दावा किया है कि चीन इस गुब्बारे का इस्तेमाल परमाणु हथियारों को ले जाने के लिए कर सकता है। अमेरिकन लीडरशिप एंड पॉलिसी फाउंडेशन की 2015 की एक रिपोर्ट में कहा गया था कि दुश्मन देश द्वारा लॉन्च किए गए गुब्बारे अमेरिका में परमाणु हथियार गिरा सकते हैं। साथ ही इलेक्ट्रिकल ग्रिड में हस्तक्षेप कर सकते हैं।

इस रिपोर्ट के लेखक एयरफोर्स के मेजर डेविड स्टकनबर्ग ने लिखा था कि इस तरह के गुब्बारे को कुछ ही महीनों में बनाकर लॉन्च किया जा सकता है। कई सौ किलोग्राम के हथियार को इतनी ऊंचाई पर ले जाने के बाद इसे कोई रडार भी डिटेक्ट नहीं कर सकता है।

स्टकनबर्ग ने शुक्रवार को कहा कि चीन का यह गुब्बारा एक प्रकार का ड्राई रन है जो अमेरिका को एक रणनीतिक संदेश भेजने के लिए लॉन्च किया गया है।

डिफेंस एक्सपर्ट जॉन पैराचिनी ने बताया कि जो गुब्बारा अमेरिका के आसमान में मंडरा रहा था , वह लगभग तीन बस जितना लंबा था।

क्या पहले भी गुब्बारे में बम रखकर गिराए जा चुके हैं?

5 मई 1945 की बात है। यानी दूसरे विश्व युद्ध में जर्मनी के आत्मसमर्पण करने से 3 दिन पहले की। अमेरिका के ओरेगॉन के ब्लाए शहर में छह लोगों की मौत हो गई। स्थानीय मीडिया की खबरों में कहा गया कि मरने वालों के ऊपर बारूद से भरे बड़े -बड़े गुब्बारे गिराए गए। दरअसल, इन गुब्बारों को जापान ने भेजा था।

अमेरिकी नेवी के पुराने दस्तावेजों के मुताबिक , गुब्बारे 10 मीटर चौड़े, 20 मीटर ऊंचे थे और इनमें हाइड्रोजन गैस भरी हुई थी। ये गुब्बारे छोड़ते वक्त जापान ने प्रशांत महासागर के एयर फ्लो यानी वायु प्रवाह का लाभ उठाया था। उन्हें पता था कि हवा इन्हें सीधे अमेरिका तक बहा ले जाएगी।

ये गुब्बारे बेहद हल्के कागज से बने थे , जिन पर सेंसर वाले बम लगे थे। इनकी ट्यूब्स में बारूद भरा गया था और साथ में एक एक्टिवेशन डिवाइस भी लगाई गई थी। ये गुब्बारे 12 किलोमीटर की ऊंचाई तक उड़ने में सक्षम थे और एक बार में 7,500 किलोमीटर तक की उड़ान भर सकते थे।

भारत समेत दुनिया के दूसरे देशों में भी देखे गए चीनी गुब्बारे

अमेरिका के डिफेंस एक्सपर्ट एचआई सटन ने दावा किया है कि जनवरी 2022 में चीन के जासूसी गुब्बारे ने भारत के सैन्य बेस की जासूसी की थी। इस दौरान चीन के जासूसी गुब्बारे ने अंडमान निकोबार द्वीप समूह की राजधानी पोर्ट ब्ले यर के ऊपर से उड़ान भरी थी। उस दौरान सोशल मीडिया पर इसकी तस्वीर भी वायरल हुई थी।

उस वक्त भारत सरकार की तरफ से इस पर कोई आधिकारिक बयान नहीं आया था। यह खुलासा भी नहीं हो सका था कि यह गुब्बारा किसका था। हालांकि, तब भी चीन पर ही शक जताया गया था।

स्थानीय मीडिया संगठन अंडमान शीखा की 6 जनवरी 2022 की रिपोर्ट में यह सवाल उठाया गया था कि किस एजेंसी ने आसमान में इस गुब्बाडरे को उड़ाया है और क्यों ? यदि इस गुब्बारे को अंडमान में किसी एजेंसी ने नहीं उड़ाया है तो इसे जासूसी के लिए भेजा गया था?

क्या जासूसी के लिए अमेरिका भी इस तरह के गुब्बारे का इस्तेमाल कर चुका है?

प्रोजेक्ट जेनेट्रिक्स : अमेरिकी एयरफोर्स ने दूसरे विश्व युद्ध के बाद चीन , पूर्वी यूरोप और सोवियत यूनियन की जासूसी के लिए प्रोजेक्ट जेनेट्रिक्स लॉन्च किया था। इसे WS-119L के नाम से भी जाना जाता है।

जनरल मिल्स ने इन देशों की खुफिया जानकारी और उनकी तस्वीरों को हासिल करने के लिए 10 जनवरी और 6 फरवरी 1956 को 5 अलग-अलग लॉन्च साइट से 516 जासूसी गुब्बारे छोड़े थे।

इनमें से सिर्फ 31 ने काम की तस्वीरें और खुफिया जानकारी भेजी थी। इस दौरान कई गुब्बारों को मार गिराया गया था। इनमें से कई देशों ने राजनयिक विरोध भी दर्ज कराया था।

https://www.bhaskar.com/amp/db-original/explainer/news/china-balloon-mystery-us-fighter-jet-shoots-down-spy-balloon-130891175.html

The EurAsian Times

Tue, 07 Feb 2023

Shooting Down 6 PLAAF Fighter Jets, Meet US' 'Revolutionary' Missile that Popped China's 'Spy Balloon'

By Tanmay Kadam

A US Air Force F-22 Raptor popped a Chinese "spy balloon" on February 4 using an AIM-9X Sidewinder missile, marking the first kill for the mighty Raptor. Interestingly, this wasn't the first time the Sidewinder had destroyed a Chinese target.

The Sidewinder is the world's first heat-seeking missile and is the most widely used missile in the West, with at least 27 nations operating the missile, other than the United States.

It is undoubtedly one of the most significant innovations in guided missile technology in the last 60 years, revolutionizing air warfare.

It all began in 1946 at the Naval Ordnance Test Station (NOTS), Inyokern, California, which has now become the Naval Air Weapons Station China Lake, where the US Navy physicist William B McLean came up with a novel idea during his work with the lead-sulfide proximity fuzes that were sensitive to infrared radiation.

Maclean reasoned that if a proximity fuze could read infrared signatures to initiate detonation, they should also be able to track infrared signatures, based on which he envisioned a missile that would adjust its course mid-flight to keep the target's heat signature reflected onto a sensitive photocell.

Thus, making the missile seek heat.

Maclean began working on his concept independently with a small team of volunteers and laboratory funding, designating the effort as 'Local Fuze Project 602.'

His concept entailed a gyroscopically spinning magnet that would reflect the emissions from a heat source onto a sensitive photocell. When the source moves away from the gyro's axis, the

photocell generates a signal in a coil surrounding the magnet, prompting it to turn its axis toward the mobile heat source.

By 1950, Maclean came up with a name for his missile, 'the Sidewinder,' inspired by a snake that can detect its prey by sensing its body heat. Interestingly, the missile's movement in the air also resembled that of a serpent.

Maclean's developmental work did not receive official funding until 1951 when it was mature enough to show to Admiral 'Deak' Parsons, the Deputy Chief of the Bureau of Ordnance (BUORD). It subsequently received designation as a program in 1952.

Just one year later, in 1953, McLean's Sidewinder missile successfully shot down its first target drone in a training environment, demonstrating the effectiveness of his concept.

The AIM-9 Sidewinder finally entered service in 1956. The nine-foot-long missile, with a glass nose containing its internal guidance system, had no means of pilot control after it was launched.

For the American pilots at the time, this new technology seemed like 'out of this world!' A US Navy pilot described the missile's seeker as a "man-made eyeball" as he recalled how it was following the heat of the cigarette in his hand.

"I was a cigarette smoker in those days and had one in my hand. As I crossed the room, I noticed that the eyeball was tracking me," said late American naval aviator, test pilot, and NASA astronaut.

Shooting Down Chinese Fighter Jets

The Sidewinder missile was used in combat for the first time during the second Taiwan Strait Crisis in 1958.

Taiwan signed a mutual defense treaty with the US in 1954. So, when the conflict erupted, Taipei requested Washington's assistance, after which then-US President Dwight D Eisenhower ordered the US Navy's Seventh Fleet to the region.

Additionally, the US Air Force (USAF) was also involved with fighters like the supersonic F-100D Super Sabre, F-101C Voodoos, and F-104A Starfighters, as well as B-57B Canberra tactical bombers.

Apart from that, in a highly secret effort called 'Operation Black Magic,' the US Navy modified some of the F-86 Sabre fighters of the Republic of China Air Force (ROCAF) – also unofficially called the Taiwanese Air Force – to carry the AIM-9 Sidewinder missile.

Two factors prompted the decision to provide Taiwan with the new and highly secretive Sidewinder missile: First was the massive numerical superiority of the PLA Air Force (PLAAF) and the technical deficiencies of the Taiwanese Sabres against the Chinese MiG-15.

The MiG-15's service ceiling of nearly 51,000 feet exceeded that of the US-made fighters by almost 2,000 feet which provided the Chinese with a massive advantage in terms of height in an era when dogfights usually entailed cannon fire.

This single advantage could turn the tide in China's favor.

However, the Sidewinder negated this advantage, as the Taiwanese pilots could fire the missile from below the Chinese fighter jets, and the missiles would follow the heat signature of the targets.

A total of 40 Sidewinder missiles were sent to Taiwan, and 20 Sabres were modified to carry them via specialized launch rails.

On September 24, 1958, the PLAAF dispatched a total of 126 MiG-15s and the more advanced MiG-17s across the Taiwan Strait, whereas Taiwan could scramble only 48 F-86 Sabres for interception.

A sizeable number of Taiwanese jets were armed with AIM-9 missiles, enough to compensate for China's numerical superiority and advantage of height.

The Chinese MiGs positioned themselves above Taiwan's Sabre as expected. However, the Taiwanese pilots launched their Sidewinder missiles, scoring six confirmed kills with them and nine overall.

This forced the Chinese fighter pilots to break from the fight and retreat to their airstrips, and thus, the Taiwanese side emerged victorious without a single loss of jet.

Taiwan's Victory Came At A High Cost For The US

One of the Sidewinder missiles fired by Taiwanese pilots hit a Chinese MiG-17 but failed to detonate and instead lodged itself in the airframe of the MiG, allowing the pilot to bring both plane and missile back to base.

The Chinese engineers then removed this Sidewinder, disassembled it, and shipped it off to the Soviet Union to see if it could reverse engineer the missile.

The Soviet engineers managed to copy the missile's infrared tracking, in-flight steering, and stability mechanisms and created their self-guided missile called the Vympel K-13.

"The Sidewinder missile was to us a university offering a course in missile construction technology which has upgraded our engineering education and updated our approach to the production of future missiles," Soviet engineer Gennadiy Sokolovskiy would later recount.

The K-13 entered service in 1960, only two years after the Chinese had captured the undetonated Sidewinder missile. Subsequently, the Soviets produced the R-3 version of the missile, which they began shipping to the Warsaw Pact nations.

The missile designs were also provided to the Chinese in return for their help in acquiring it. Only four years after the US acquired this revolutionary missile technology, it became the most prevalent air-to-air weapon in the arsenal of its adversaries.

https://eurasiantimes.com/meet-us-revolutionary-missile-that-shoot-down-6-plaaf-fighter-jets/

The EurAsian Times

Tue, 07 Feb 2023

Ukraine War: Russia, Iran Plan to Setup Drone Manufacturing Facility Near Moscow After 'Super Success' of Shahed-136 UAVs: WSJ

By Sakshi Tiwari

Russian attack capabilities could receive a massive shot-in-the-arm with a new Iranian kamikaze drone facility near Moscow.

Augmenting defense cooperation, Moscow and Tehran are moving forward with plans to construct a new factory in Russia that could produce at least 6,000 drones with Iranian designs for the war in Ukraine, Wall Street Journal reported.

According to reports, a high-level Iranian delegation traveled to Russia early January to see the facility site and discuss the project launch details.

The officials with knowledge of the situation said Iran and Russia are now developing a new engine for the Shahed-136 UAV, allowing it to travel farther and faster. The cutting-edge drone would be developed in the new factory.

The report comes about two months after US officials first announced establishing a joint production line for lethal drones in December 2022. "This partnership poses a threat not just to Ukraine but to Iran's neighbors in the region," said one senior official at the time. US National Security Council spokesperson John Kirby later confirmed it.

On January 5, officials of the two countries visited Yelabuga, a Russian town located around 600 miles east of Moscow. They toured the site, saying they plan to erect a new factory that will produce at least 6,000 drones annually in the coming years.

Brig. Gen. Abdollah Mehrabi, head of the Islamic Revolutionary Guard Corps Aerospace Force Research and Self-Sufficiency Jihad Organization, and Ghassem Damavandian, the head of Iran's Quds Aviation Industry, led the Iranian delegation.

Further, the visit comes amid an intense bombardment of Ukrainian cities using Iranian kamikaze drones. Recent media reports have also suggested that with Putin's forces stepping up the frequency of drone strikes on Ukraine in the last month, there has been a fast depletion of its Shahed-131 and Shahed-136 stockpile.

Last month, Ukraine's Defense Minister Oleksii Reznikov claimed on Twitter that the Russian forces had used up 88 percent of their stockpile of Shahed drones, leaving them with just 90 Iranian-manufactured UAVs.

Against that backdrop, a manufacturing facility could significantly bolster drone supplies to Russia, especially since the war shows no signs of abating. It would also considerably strengthen the defense cooperation between Moscow and Tehran, which US officials have flagged as an alarming development.

Russia & Iran Are Expanding Military Ties

According to US sources, Tehran has already given Moscow hundreds of drones it has used to attack military and civilian targets in Ukraine. Some senior intelligence officials from Ukraine earlier revealed that a new shipment of Shahed-136 kamikaze drones was delivered to Russia in January, which contained over 400 Unmanned Aerial Vehicles (UAVs).

The Biden administration has also expressed concern over the emergence of full-fledged defense cooperation between Russia and Iran.

Previously, the White House announced that Moscow was training Iranian pilots to fly Russian jet fighters. Last month, Iran officially confirmed that it has ordered Russian Sukhoi Su-35 warplanes and expects to receive these cutting-edge aircraft within three months.

With the extent of defense cooperation growing between the two states, officials in Iran have confirmed the purchase of Russia's cutting-edge Su-35 fighters for Tehran. Not just that, media reports suggested that delivery of S-400 air defense systems could also be under consideration.

Iran could also supply its Fateh-110 and Zolfaghar ballistic missiles to Russia in the coming weeks after tweaking them by the UN norms. The Ukrainian Air Force spokesperson Yurii Ihnat recently claimed on national television that his country was currently defenseless against these ballistic missiles.

The kamikaze drones that once caught the Ukrainian troops off-guard have slowly lost the hype. Ukraine's air defenses have generally successfully eliminated these drones over time. As a slow-moving, loud drone with propeller engines, the Shahed-136 is reasonably simple to identify and shoot down.

If the country's claims are anything to go by, Ukraine has shot down more than 540 drones since they first began to circulate over its skies last fall.

As for the new drone factory, construction is yet to begin. It is unlikely that the production line will immediately change the balance of power in Ukraine, where there are indications that Russia will launch a new onslaught in the coming weeks.

https://eurasiantimes.com/ukraine-war-russia-iran-plan-to-setup-drone-manufacturing-facility/

Science & Technology News

THE TIMES OF INDIA

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ISRO Set to Launch Second Developmental Flight of SSLV

ISRO will launch the second developmental flight of the Small Satellite Launch Vehicle (SSLV) from Satish Dhawan Space Centre in Sriharikota at 9.18am on Friday (February 10). SSLV-D2/EOS-07 would carry three payloads, including earth observation satellite EOS-07, Isro said.

EOS-07, which will be the primary payload, is in the 200kg small satellite class. Two more payloads, including Janus-1 from US firm Antaris, will also be flown.

SSLV, in its maiden flight in August, failed to place the satellite in a desired orbit. Isro conducted a failure analysis. The agency, on its website, said, “Subsequent detailed analysis of the flight events and observations ranging from countdown, lift-off, propulsion performance, stage separations and satellite injection revealed that there was a vibration disturbance for a short duration on the Equipment Bay (EB) deck during the second stage (SS2) separation, that affected the Inertial Navigation System (INS), resulting in declaring the sensors faulty by the logic in Fault Detection & Isolation (FDI) software.” "Considering the clear identification of the cause of the flight anomaly and suggested corrective actions, the next development flight (SSLV-D2) is planned to be executed complying to the recommendations, its satisfactory implementation, review and approval by the authorized committees," the agency said.

https://timesofindia.indiatimes.com/india/isro-set-to-launch-second-developmental-flight-of-sslv/articleshow/97648416.cms?from=mdr

The Indian EXPRESS

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NASA-ISRO Partnership’s Satellite All Set to Arrive in India: What is NISAR And its Mission?

Jointly developed by the National Aeronautics and Space Administration (NASA) and the Indian Space Research Organisation (ISRO), an Earth-observation satellite, called NISAR (NASA-ISRO Synthetic Aperture Radar), got a send-off ceremony at the American space agency’s Jet Propulsion Laboratory (JPL) in Southern California on Friday (February 3).

The SUV-size satellite will be shipped to India in a special cargo container flight later this month for a possible launch in 2024 from Satish Dhawan Space Centre in Andhra Pradesh.

The event was attended by ISRO Chairman S Somanath, JPL Director Laurie Leshin and officials from NASA and India, according to a statement released by the American space agency.

“Today we come one step closer to fulfilling the immense scientific potential NASA and ISRO envisioned for NISAR when we joined forces more than eight years ago,” Somanath said while speaking to the media. “This mission will be a powerful demonstration of the capability of radar as a science tool and help us study Earth’s dynamic land and ice surfaces in greater detail than ever before.”

What is NISAR?

NISAR has been built by space agencies of the US and India under a partnership agreement signed in 2014. The 2,800 kilograms satellite consists of both L-band and S-band synthetic aperture radar (SAR) instruments, which makes it a dual-frequency imaging radar satellite.

While NASA has provided the L-band radar, GPS, a high-capacity solid-state recorder to store data, and a payload data subsystem, ISRO has provided the S-band radar, the GSLV launch system and spacecraft.

Another important component of the satellite is its large 39-foot stationary antenna reflector. Made of a gold-plated wire mesh, the reflector will be used to focus “the radar signals emitted and received by the upward-facing feed on the instrument structure”, according to NASA.

What is the mission?

Once launched into space, NISAR will observe subtle changes in Earth’s surfaces, helping researchers better understand the causes and consequences of such phenomena. It will spot warning signs of natural disasters, such as volcanic eruptions, earthquakes and landslides. The satellite will also measure groundwater levels, track flow rates of glaciers and ice sheets, and monitor the planet’s forest and agricultural regions, which can improve our understanding of carbon exchange.

By using synthetic aperture radar (SAR), NISAR will produce high-resolution images. SAR is capable of penetrating clouds and can collect data day and night regardless of the weather conditions.

According to NASA, “the instrument’s imaging swath — the width of the strip of data collected along the length of the orbit track — is greater than 150 miles (240 kilometres), which allows it to image the entire Earth in 12 days.”

NISAR is expected to be launched in January 2024 from Satish Dhawan Space Centre into a near-polar orbit. The satellite will operate for a minimum of three years. NASA requires the L-band radar for its global science operations for at least three years. Meanwhile, ISRO will utilise the S-band radar for a minimum of five years.

https://indianexpress.com/article/explained/explained-sci-tech/satellite-partnership-nasa-isro-nisar-mission-8427080/