December
2022

समाचार पत्रों से चयित अंश
Newspapers Clippings

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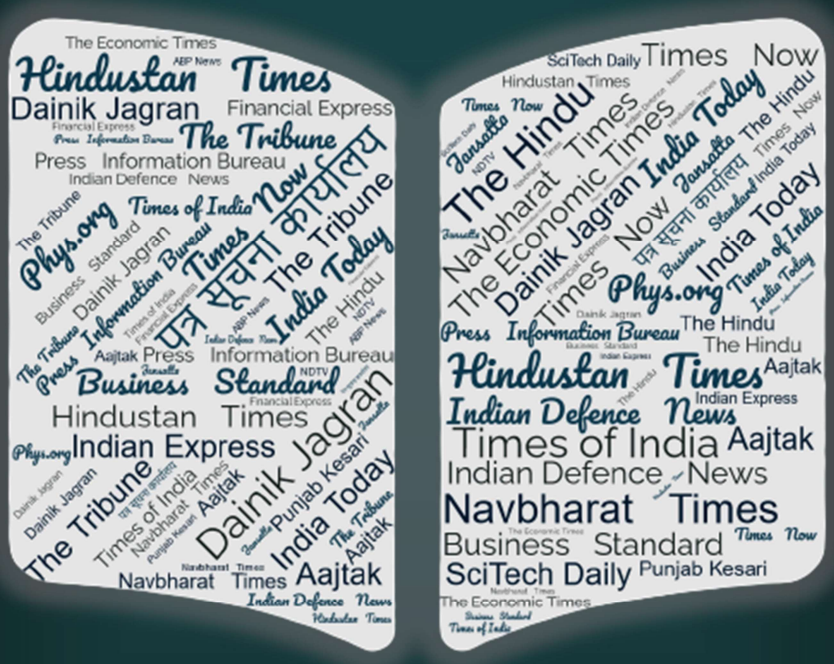
खंड : 47 अंक : 244 24-26 दिसंबर 2022

Vol.: 47 Issue: 244 24-26 December 2022



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Defence News

Defence Strategic : National/International

Sun, 25 Dec 2022

सीमा पर तनाव के बीच सशस्त्र बलों के लिए प्रलय बैलिस्टिक मिसाइलों को मंजूरी, चीन-पाक बॉर्डर पर होगी तैनाती

चीनी सीमा पर तनातनी के बीच रक्षा मंत्रालय ने रविवार (25 दिसंबर) को एक बड़े फैसले में सशस्त्र बलों के लिए लगभग 120 प्रलय बैलिस्टिक मिसाइलों की खरीद को मंजूरी दे दी है. इन बैलिस्टिक मिसाइलों को चीन (China) और पाकिस्तान (Pakistan) के साथ लगती सीमाओं पर तैनात किया जाएगा. वर्तमान में, प्रलय बैलिस्टिक मिसाइलें 150 से 500 किलोमीटर तक के लक्ष्य को भेद सकती हैं और इंटरसेप्टर मिसाइलों के माध्यम से दुश्मन के लिए इनको रोकना बेहद मुश्किल है.

वरिष्ठ रक्षा सूत्रों ने एएनआई को बताया, "रक्षा मंत्रालय की एक उच्च स्तरीय बैठक ने सशस्त्र बलों के लिए लगभग 120 मिसाइलों के अधिग्रहण और सीमाओं पर उनकी तैनाती को मंजूरी दे दी है." इन बैलिस्टिक मिसाइलों के अधिग्रहण को देश के लिए एक बड़े विकास के रूप में देखा जा रहा है. चीन और पाकिस्तान दोनों के पास बैलिस्टिक मिसाइलें हैं जो सामरिक भूमिकाओं के लिए हैं.

मिसाइलों की रेंज को बढ़ाया जा सकता है

सूत्रों ने कहा कि रक्षा अनुसंधान एवं विकास संगठन की ओर से विकसित मिसाइल को और बेहतर किया जा रहा है और अगर सेना चाहे तो इसकी रेंज को काफी बढ़ाया जा सकता है. 2015 के आसपास मिसाइल प्रणाली का विकास होना शुरू हुआ था और इस तरह की क्षमता के विकास को दिवंगत सीडीएस जनरल बिपिन रावत ने थल सेनाध्यक्ष के रूप में बढ़ावा दिया था.

दो बार किया गया सफल परीक्षण

इंटरसेप्टर मिसाइलों को हराने में सक्षम होने के लिए उन्नत 'प्रलय' मिसाइल को खास तरह से विकसित किया गया है. यह बीच हवा में एक निश्चित सीमा तय करने के बाद अपना रास्ता बदलने की क्षमता रखती है. इस मिसाइल का पिछले साल दो बार सफल परीक्षण किया गया था.

पहले वायुसेना में किया जाएगा शामिल

इस मिसाइल को सबसे पहले भारतीय वायुसेना में शामिल किया जाएगा, जिसके बाद भारतीय सेना में शामिल होने की संभावना है. प्रस्ताव को रक्षा मंत्रालय के स्तर पर मंजूरी दे दी गई है और इसने विनिर्माण और सशस्त्र बलों में शामिल करने का मार्ग प्रशस्त किया है. रक्षा विशेषज्ञों का कहना है कि इस तरह की मिसाइल प्रणाली का इस्तेमाल लंबी दूरी की दुश्मन वायु रक्षा प्रणालियों को नष्ट करने के लिए किया जा सकता है. इन मिसाइलों को शामिल करने के प्रस्ताव को ऐसे समय में मंजूरी दी गई है जब रक्षा बल एक डेडिकेटड रॉकेट फोर्स बनाने की दिशा में काम कर रहे हैं जो लंबी दूरी से दुश्मन के ठिकानों को मार गिरा सके. चीनी सेना के पास पहले से ही डेडिकेटड रॉकेट फोर्स है.

https://www.abplive.com/news/india/defence-ministry-cleared-procurement-of-120-pralay-ballistic-missiles-for-indian-armed-forces-2291277

THE ECONOMIC TIMES

Sun, 25 Dec 2022

India Clears Pralay Tactical Ballistic Missiles for Armed Forces, to be Deployed along China Border

In a major decision, the Defence Ministry has cleared the procurement of around 120 Pralay ballistic missiles for the Indian armed forces that will deploy them along the borders with China and Pakistan. At present, the Pralay ballistic missiles can take out targets from 150 to 500 kms and are extremely difficult to intercept for the enemy through interceptor missiles. "A high-level meeting of the Defence Ministry cleared the acquisition of around 120 missiles for the armed forces and their deployment along the borders," senior defence sources told ANI here.

The acquisition of these ballistic missiles is being seen as a big development for the country which now has a policy that allows the use of ballistic missiles in tactical roles. Both China and Pakistan have ballistic missiles which are for tactical roles.The missile developed by the Defence Research and Development Organisation is being further developed and its range can be extended significantly if the forces want it, the sources said.

The missile system started getting development around 2015 and the development of such a capability was given a push by the late Gen Bipin Rawat as Chief of Army Staff. The missile was successfully tested twice on consecutive days last year on December 21 and December 22.

'Pralay' is a quasi-ballistic surface-to-surface missile. The advanced missile has been developed in a way to be able to defeat interceptor missiles. It has the ability to change its path after covering a certain range in midair. 'Pralay' is powered by a solid propellant rocket motor and other new technologies. The missile guidance system includes state-of-the-art navigation and integrated avionics. The missile would be first inducted into the Indian Air Force likely to be followed by the Indian Army. The proposal has been cleared at the Defence Ministry level and has paved the way for manufacturing and induction into the armed forces. Defence watchers say such a missile system can be used for taking out long-range enemy air defence systems and also other high-value installations and weaponry. The proposal to induct these missiles has been cleared at a time when the defence forces are working towards creating a dedicated rocket force which can take out enemy targets from long range. The Chinese military already has a dedicated rocket force.

https://economictimes.indiatimes.com/news/defence/india-clears-pralay-tactical-ballistic-missiles-for-armed-forces-to-be-deployed-along-china-border/printarticle/96500010.cms

The EurAsian Times

Sat, 24 Dec 2022

Akin to Russian Iskander, India's Pralay Missile Set to Boost Military's Firepower; Can Target China's Dual-Use Military Bases

By Sakshi Tiwari

In a significant development expected to bolster India's firepower, the Indian military is set to acquire the 'Pralay' short-range ballistic missiles for tactical operations. An order for the missile is expected to be placed soon. Developed by the Defense Research and Development Organization (DRDO), Pralay is a canisterized tactical, surface-to-surface, short-range ballistic missile (SRBM) and has often been compared with the Russian Iskander (SS-26 Stone) ballistic missiles.

Earlier this week, news agency ANI quoted defense officials as saying that the proposal put up by the Indian armed forces is in advanced stages and will be discussed for approval at a high-level conference. The talk for induction is catching pace even as the missile has been tested by the DRDO only two times. In December last year, the DRDO successfully test-fired the Pralay surface-to-surface, short-range ballistic missile (SRBM). At the time, the mission achieved all its goals, with all subsystems operating well. The missile trajectory was monitored, and all events were collected by sensors stationed near the impact point across the east coast, as reported by EurAsian Times. The newly developed missile, fired from a canister, followed the intended quasi-ballistic trajectory and made a highly accurate strike on the target, validating the control, guidance, and mission algorithms. This quasi-ballistic missile can make precise maneuvers before impacting a target. One of the most defining features of the Pralay missile is that it uses a fused silica Radar-dome (RADOME) developed by DRDO for locating its target. Radomes are

dome-shaped structures that shield radars from inclement weather while enabling the radar to receive electromagnetic signals without distortion or attenuation, thus, ensuring precision.

The Rudra Mk-2, NGARM, and QRSAM are other indigenous Indian missiles that use the fused silica Radome produced by the DRDO. The missile guidance system of the brand-new Pralay missile has a cutting-edge navigation system and integrated avionics. Pralay, for one, can launch a payload of about 350 to 700 kilograms at targets up to 150 to 500 kilometers away and can be readied for launch from a mobile launcher at short notice. The Pralay integrates several unique technologies and uses a solid-propellant rocket motor. Even though reports suggest that the Pralay is based on the Indian ballistic missile Prithvi, it has been likened more to the Iskander ballistic missiles of Russia that have been overwhelmingly deployed against Ukraine and have proved their combat prowess.

Pralay Has Similarities With Russia's Iskander

Russia's 9K720 Iskander-M short-range ballistic missile (SRBM), designated as SS-26 "Stone" by NATO, has been extensively deployed by its military in the ongoing conflict with Ukraine. Each launcher vehicle can transport two missiles with a maximum flying range of 310 miles (nearly 500 kilometers). This indicates that the range of India's Pralay ballistic missile is comparable to the range of Iskander, the latter having struck targets deep inside the Ukrainian territory. The payload capacity of Iskander is about 1500 pounds or over 680 kilograms. Previous reports had indicated that with a high payload, it could travel a distance of 350 kilometers. However, if the payload mounted on Pralay is bisected, the missile can hit a target as far as 500 kilometers. As a result, the range and trajectory parameters of the Pralay missile are comparable to those of the 9K720 Iskander from Russia. However, the Iskander missile uses an optical Digital Scene Matching Area Correlator (DSMAC) to identify targets.

The DSMAC is an autonomous missile guidance concept based on area correlation of sensed ground scenes and ensures enhanced precision of attack. The Iskander missile in Ukraine has revealed that it employs penetration aids (PENAIDs), which take the form of mortar-like decoys to fool enemy radars and interceptor missiles. In addition, while Both Pralay & Iskander feature an Inertial Navigation System (INS) or Satellite Navigation, the Iskander goes over and beyond and uses Terrain Contour Matching (TERCOM). This essentially means that the Iskander missile is harder to intercept. Compared to inertial navigation systems, a TERCOM system significantly improves a missile's accuracy. Due to improved precision, a TERCOM-equipped missile can fly closer to obstacles and at generally lower altitudes, making it more difficult for ground radar to identify.

The plan to acquire the Pralay missile by the Indian military is significant because it comes at a time when the Indian Defense Ministry's top echelons have been discussing the development of a Rocket force for the Indian Army. As long-range strategic weapons are under the strategic forces command's jurisdiction, the Pralay missile and BrahMos supersonic cruise missile will be the longest-range tactical weapon systems in the inventory of the Indian defense forces. The Pralay missile development began in 2015, and it took four years to test the necessary technology. According to reports in the Indian media, the Pralay missile will allow the Indian Army to target dual-use Chinese infrastructure and military bases on the Tibetan Plateau. This would enable the Indian military to create effective deterrence with the PLA. Earlier, the PLA was rattled when the Indian side deployed the BrahMos cruise missile along the disputed LAC.

However, as of now, only two tests have been conducted using the Pralay ballistic missile. This could mean that the missile would not be operational for at least a couple of years since supporting mobile platforms will have to be developed for the ballistic missile. More details would, however, emerge after the high-level talks concerning its procurement.

https://eurasiantimes.com/akin-to-iskander-indias-pralay-ballistic-missile-set-to-boost/

ThePrint

Sat, 24 Dec 2022

Defence Ministry Approves Rs 84,238 Cr-Procurement: Here are the Big-Ticket Items on the List

Defence Minister Rajnath Singh-led Defence Acquisition Council (DAC) Thursday gave Acceptance of Necessity (AON) to 24 capital procurement proposals worth Rs 84,238 crore. These proposals comprise six for the Indian Army, six for the Indian Air Force, 10 for the Indian Navy, and two for the Indian Coast Guard. Of the total, 21 of the proposals worth Rs 82,127 crore, have been approved for procurement through the indigenous route. ThePrint takes a look at the big projects that have been given AON, the first stage in a procurement process that allows the forces to go ahead with a project. The duration of the procurement varies from case to case.

Project Zorawar

The DAC has approved the initiation process for procurement of 354 light tanks, also known as Project Zorawar. Under the Rs 16,000 crore-project, the Army will induct indigenous light tanks with a maximum weight of 25 tonnes — and a margin of 10 per cent — that have the same firepower as regular tanks. These tanks will be armed with Artificial Intelligence (AI), integration of tactical surveillance drones to provide a high degree of situational awareness and loitering munition, along with an active protection system.

The Army also wants these tanks to be amphibious, so they can be deployed across riverine regions, even the Pangong Tso lake in Eastern Ladakh. The project has been named after Zorawar Singh Kahluria — a military general who served under Jammu's Raja Gulab Singh — known as the 'conqueror of Ladakh'. The plan is to design and develop these tanks indigenously, a project that will be open to both private and state owned firms.

The Army aims to have the production of a prototype and beginning of trials in three years from the sanction of the project, which was Thursday. The Army currently operates three different types of tanks with the latest being the Arjun Mk 1A, which weighs a massive 68.5 tonnes. The T-90 weighs about 46 tonnes and the T-72 about 45 tonnes. Ladakh stand-off with China has shown that armoured columns are one of the most prominent factors in defining the operational capability of the land forces. Army sources have, in the past, admitted that the People's Liberation Army (PLA) had inducted a large number of technologically modern, "state-of-art" tanks, which were being employed operationally as a mix of medium and light tanks with high power-to-weight ratios. While the Army had also deployed its T-90 and T-72 tanks — surprising the Chinese — lighter tanks would mean faster deployment and increased mobility in mountainous terrain.

Futuristic Infantry Combat Vehicle

Another big project that got the green light was the Futuristic Infantry Combat Vehicle (FICV). This again will be procured through the indigenous route with the bid being open to both private and state-owned firms. Incidentally, this is the third attempt in over a decade to acquire such capability. While the AON has been accorded for 480 FICV, the Army will acquire at least 2,000 of them over a period of time. The FICV will be a tracked vehicle that will replace the 1980's vintage Soviet-designed BMP-2 currently in use with the 49 battalions of the Mechanised Infantry, each with 51 BMP-2s. The BMPs are produced under licence at the Ordnance Factory Medak in Telangana. The proposed FICV are also meant to carry mini tactical surveillance drones and even loitering munitions. Indian companies expected to be in contention include Mahindra and Mahindra, TATA, Bharat Forge, and Larsen & Toubro. Foreign firms such as Rosoboronexport of Russia, General Dynamic of the US and Germany's Rheinmetall are expected to be a part of the competition besides companies from South Africa and South Korea. The FICV project was first envisaged in the mid-2000s and the formal process was initiated in 2009 by the Mechanised Infantry Directorate. The 2009 plan had envisaged induction of FICVs beginning in 2022. And this was to be given to a private company. However, the proposal was withdrawn in 2012 as it was felt that an upgrade of existing systems would suffice.

In 2014, a fresh proposal was mooted under which the government was to select state-run Ordnance Factory Board (OFB) and two private firms for separately developing prototypes of the FICVs. The project was to be implemented under Make 1 category of the defence procurement procedure, under which the government would have undertaken 90 per cent of the funding for the prototype for the three selected firms. This process was stalled with one of the players offering to manufacture the vehicles under Make 2 category, in which the money would have been spent by the industry and not the government.

Mounted Gun System

The DAC has also given the AON for the procurement of 300 mounted gun systems for approximately Rs 7,500 crore. This is a project that has been pending for years and is part of a 1999 artillery modernisation programme that was rolled out in 2001. Unlike a regular artillery gun, these 155mmx52 caliber guns will be fitted on a vehicle that will allow it to traverse through tough terrains and also to shoot and scoot quicker.

Ballistic helmets

A small but significant project is Army's plan to acquire about 80,000 ballistic helmets for its soldiers deployed along the borders with China and Pakistan besides in counter insurgency operations in Jammu and Kashmir. The idea is to replace the system of "patkas", a round steel plate that the soldiers wear in gun battles. Even though the Army has gone in for ballistic helmets, the idea is for them to withstand direct fire from the AK 47 assault rifles.

Multi-Purpose Vessels and High Endurance Autonomous Vehicles

The Navy has got sanctions for procurement of Multi-Purpose Vessels and High Endurance Autonomous Vehicles. Sources in the navy said these vessels are more like plug and play which means that they can be used for various purposes with the right equipment including for mine sweeping. These vessels are meant to perform multi-role support functions such as maritime surveillance & patrol, launching/ recovery of torpedoes and operation of various types of aerial,

surface and underwater targets for Gunnery/ ASW firing exercises. The Navy has already inked a deal for two multi-purpose vessels with Larson and Tourbo in March this year.

https://theprint.in/india/defence-ministry-approves-rs-84238-cr-procurement-here-are-the-big-ticket-items-on-the-list/1280214/

The Tribune

Sat, 24 Dec 2022

IAF Deficiencies

Editorial

AIR Chief Marshal VR Chaudhari has pointed out 'critical deficiencies' being faced by the Indian Air Force (IAF), such as the shortage of fighter squadrons and force multipliers. Days after he reviewed the IAF's operational readiness following the clash between Indian and Chinese troops in Arunachal Pradesh, he has emphasised that the shortfall should be addressed on priority. It is noteworthy that the Chief of Air Staff chose a public forum — a seminar on 'India's Eminence in the Emerging World Order' — to draw the nation's attention to this pressing matter. It's clear that he wants the powers that be to understand the seriousness of the situation and come up with a time-bound plan to overcome the deficiencies.

The IAF has 31 fighter squadrons at present, while the sanctioned strength is 42. The number has fallen as some of the squadrons have been phased out in recent years. There is a dire need to expedite inductions so as to reduce the yawning gap, especially because China is actively bolstering its air power.

According to the US Department of Defence's China Military Power Report that was released recently, the People's Liberation Army Air Force (PLAAF) is 'rapidly catching up with western air forces and continues to modernise with the delivery of domestically built aircraft and a wide range of unmanned aerial vehicles.' The report says that the PLAAF and PLAN (PLA Navy) Aviation together constitute the third largest aviation force in the world, with over 2,800 aircraft. The PLAAF has 2,084 units in its active aircraft inventory, well above the IAF's 1,645, as per the World Directory of Modern Military Aircraft.

The latest Global Air Powers Ranking does put the IAF at the sixth place, one notch above the PLAAF, in terms of attack and defence capabilities, but the Chinese might overtake us sooner than later unless we plug the gaps in defence acquisition and manufacturing.

America's $450 million F-16 sustainment package for Pakistan gives India another vital reason to augment its air assets. Initiatives such as the first-ever India-Japan air combat exercise, scheduled to be held next month, can also help the IAF become future-ready.

https://www.tribuneindia.com/news/editorials/iaf-deficiencies-463880

ThePrint

Sat, 24 Dec 2022

There's a Fast-growing Dragon in the Sea. For Navy to Keep up, India must Tackle Key Hurdles

By TN Ninan

These last few weeks have been busy for the navy. It has just commissioned the INS Mormugao, a 7,400-tonne destroyer. Three months ago the prime minister commissioned the country's first indigenously built aircraft carrier, the 45,000-tonne Vikrant. The navy may also be about to commission its second nuclear ballistic missile submarine, the INS Arighat — the precise date will remain secret. Meanwhile, the fifth conventional Scorpene submarine, the INS Vagir, has been delivered to the navy and will be commissioned early next year along with the first of a new class of frigates.

There is no previous period when the navy acquired so many major, front-line ships and submarines in such short order. Last year, 2021, was also busy as it saw the commissioning of two Scorpene submarines and a destroyer. This would suggest that the navy's expansion is gaining momentum, and in some ways that would be true. But one must also look at the longer-term picture. Compared to 2021 and 2022, the previous two years saw the commissioning of just one submarine and a 3,300-tonne corvette, while 2018 saw no major addition to the fleet. Broadly speaking, the trend since 2011 continues, of commissioning an average of two major warships annually.

That is an improvement on the decade before, but each ship still takes too long to get built: Seven to nine years for a destroyer, frigate or corvette — more than twice what it takes for China. Even then, key accompaniments are missing at the time of commissioning, like the right long-range, air-defence missiles, heavyweight torpedoes, anti-submarine helicopters and even carrier-borne aircraft. It has not helped that the INS Vikramaditya, the aircraft carrier acquired from the Soviet Union and commissioned in 2013, has been in dry dock repeatedly, the latest being for an extended period. One report said recently that no aircraft has landed on either of India's carriers in the last two years.

Still, you could say that India is steadily building its naval strength. The next batch of seven 6,600-tonne frigates will introduce modular construction, thereby speeding up shipbuilding by about two years. While Mazagon Dock remains the primary builder of destroyers and frigates, Garden Reach Shipbuilders & Engineers, Cochin Shipyard and Goa Shipyard are all capable now of building bigger, more complex vessels, as is the nuclear submarine-building complex at Visakhapatnam. To that list must be added a ship design and yard facility developed by Larsen & Toubro near Chennai.

None of that compares with the speed of the naval build-up by China, which last summer launched its third aircraft carrier — bigger than India's two carriers combined, with more advanced technology that will enable the launching of aircraft at shorter intervals, with more fuel and a heavier weapons load. Having already built very capable destroyers at breakneck speed, China is now planning for war on the sea with killer drones and unmanned vessels capable of

linking with manned warships for networked attack. With Beijing also developing various facilities, including a naval base, around the Indian Ocean rim, India's navy will be challenged in its home waters before long.

Yet, given limited defence budgets, there aren't enough orders to keep the shipyards humming, although many smaller ships — like shallow-water craft for anti-submarine warfare — are on order. The under-sized submarine fleet in particular has mostly ageing boats that date as far back as the 1980s, but Mazagon's submarine shed will run out of orders after delivering its sixth and last Scorpene submarine.

The follow-on order for another six has been repeatedly delayed; potential bidders are reluctant because of what they see as unacceptable terms. Meanwhile, the defence minister surprised observers recently when he said that India has started constructing what will be the fleet's third carrier; little has been heard of this order before or since. Bids to win export orders from Malaysia, Brazil and the Philippines have been lost to the competition.

The challenges facing the navy therefore are manifold: Inadequate budgets, delays in placing orders and then in construction, poorly coordinated delivery schedules, and the challenge from China. These issues need debate, even as the navy celebrates the commissioning of major warships and submarines in quick succession.

https://theprint.in/opinion/theres-a-fast-growing-dragon-in-the-sea-for-navy-to-keep-up-india-must-tackle-key-hurdles/1279468/

THE ECONOMIC TIMES

Sun, 25 Dec 2022

India Revamps Defence Infra with Army Tank Ramps, Fortification of BSF Bunkers at IB in J&K

Indian security agencies have carried out a major defence infrastructure revamp including creation of ramps for army tanks and strengthening of BSF bunkers along the International Border with Pakistan, since the two sides announced a military ceasefire in 2021, officials said. The first phase of the infrastructure renovation and creation of some new ones has been recently completed on a stretch of 26 kilometres along the front in Jammu while another 33 kilometres in the same region is being carried out, official sources told PTI.

Jammu shares a 192 km-long front of the total 2,289 kilometres of the India -Pakistan IB before it runs down towards Gujarat and Rajasthan on the country's western flank. The Line of Control (LoC) between the two neighbours falls majorly in Kashmir and it is about 772 kilometres long.

The defence infrastructure work that has been undertaken includes creation and revamp of multiple DCBs (ditch-cum-bandhs), maintenance of damaged border fence, creation of ramps for movement of army tanks to the forward areas, upgrade of Border Security Force 'morchas' (troop posts), bunkers and locations for installation of surveillance and other protection mechanism, officials said. The work is being undertaken through the funds received from the Union Home ministry, they said. Officials said these works were initiated and the first phase was completed

(on 26 kms) after India and Pakistan renewed their ceasefire agreement along the front in Jammu and Kashmir on February 20, 2021. "The other side too is undertaking similar works and both sides keep each other informed in case a major work is undertaken near the fence," a senior BSF officer said.

Barring a few violations, like when Pakistan breached the agreement and opened unprovoked fire in Jammu on September 6, Last year's ceasefire agreement is holding well, officials said. The ceasefire breach took place when the Indian side was undertaking some "maintenance work" in the Arnia sector of Jammu. A flag meeting was later held between the BSF and Pak Rangers and it was decided to uphold the ceasefire. The silence of the guns is allowing peace to prevail along the IB and border residents and farmers are able to do their normal work uninterrupted and without fearing about flying mortar shells and indiscriminate gunfire undertaken by the other side regularly (before February 20, 2021), officials said. Work is also being undertaken to level the 'kuttcha' or mud tracks that are used by BSF troop carrier vehicles to reach border posts in Jammu region. At many places, the levelling work on these approach routes has been completed, officials said. A similar work has been undertaken by the BSF along the Line of Control (LoC) in Kashmir region where it is converting the bunkers for its troops at 115 forward defence locations (FDLs) from the present CGI (corrugated galvanised iron) to solar powered compartments made of steel. The 772 kilometre-long LoC is guarded by the Army and the BSF is deployed in about 435 kms of this front under its operational command.

https://economictimes.indiatimes.com/news/defence/india-revamps-defence-infra-with-army-tank-ramps-fortification-of-bsf-bunkers-at-ib-in-jk/articleshow/96495542.cms

Outlook

Sat, 24 Dec 2022

Maharashtra: A Growing Tech Hub for Defence Technologies in India

By Anand Madia

Currently, we are living in an era that is being hailed as the ‘techade’ of India. New technologies such as machine learning, artificial intelligence, and data analytics have taken over every sector of the economy. This spells good news for innovation in defence technology in India too.

Defence Tech plays a pivotal role in the growth of new-age India. India is constantly striving to improve its internal and external security measures. Apart from government initiatives, today, the country also houses almost 200 tech start-ups that are building cutting-edge defence technology solutions. These innovations and their adoption will lead to a more resilient and secure India.

The defence industry accounts for almost 1.6 per cent of the national GDP of India and ranks third as one of the largest ecosystems in the world. With the support of the government and the implementation of new changes in policies, Indian defence tech start-ups have stunned the world by manufacturing state-of-the-art and cost-effective products. As per a recent report by consultancy firm Maier+Vidorno, the aerospace and defence industry is estimated to reach up to $70 billion by 2030.

Indian defence technology start-ups play a substantial role in building paramilitary forces and aerospace technology, bringing innovation and working toward R&D to improve technology. As our country strives to become 'aatma nirbhar' or self-reliant, we realise the vision of Prime Minister Modi's 'New India'. In line with this, Maharashtra unveiled a defence and aerospace policy in the year 2018, aimed at attracting $2 billion in investment and creating 1 lakh jobs. Under the policy, the government plans to establish defence hubs in Pune, Nagpur, Ahmednagar, Nashik and Aurangabad. The policy has helped anchor units to boost the economy by providing incentives to public sector undertakings that provide working capital to MSMEs in this sector.

For the development of defence and technology, Maharashtra has been one of the preferred destinations with easy availability of skilled manpower and environmental sustainability. With the Make in Maharashtra initiative, the government established MAITRI which will have a single clearance system for state government approvals for aerospace and defence units. The state of Maharashtra has already made a mark in varied sectors such as IT/ITeS, food processing, textiles, engineering, etc. The huge presence of these industrial units is slowly paving the way and building an ecosystem that helps support the growth of aerospace and defence manufacturing units. The renowned Defence Research and Development Organisation (DRDO) in Pune, Maharashtra, was established to build world-class weapon systems and undertake design and development for the armed forces.

Now, nearly 56 military technology start-ups provide new-age defence technology in numerous areas. Here are some of the most indigenous tech being built by start-ups in Maharashtra as the next step of the defence tech revolution:

- Drones for aerial surveillance - It is the first and only man-portable autonomous UAV with supply and drop capabilities.
- Vision processing system - The product provides a real-time interpretation of the battlefield and combines advanced imaging and sensor technology, it also has day and night vision.
- Bio-polymer platform-based products for wound care - It offers hemostatic dressing based on bioactive microfiber gelling technology.
- Robotic solutions - Its unified operating system helps manage connected robots across multiple sectors.
- Video surveillance system - It offers a high-end electro-optic surveillance system for defence and aerospace organisations
- Combat weapon systems - These tanks are built for integration with engine, transmission, hybrid combat armour, and anti-drone defence systems for battle interfaces.

As India spearheads towards Aatmanirbhar Bharat, giving impetus to the mission is the approval of Make II projects. This includes indigenously-built infantry training weapon simulators and drone kill systems. Maharashtra is one of the most industrialised states in India and the Government of Maharashtra has been actively implementing policies and reforms to improve India's position in the World Bank. India being the largest importer of arms, start-ups are undoubtedly playing a crucial role in helping India become self-reliant when it comes to defence technologies.

https://www.outlookindia.com/business/maharashtra-a-growing-tech-hub-for-defence-technologies-in-india--news-247838

THE ECONOMIC TIMES

Fri, 23 Dec 2022

India Receives USD 3.21 mn FDI in Defence Industries During Apr-Sep FY23

India received foreign direct investment (FDI) worth USD 3.21 million in defence industries during April-September period this fiscal year, Parliament was informed on Friday. The sector had attracted USD 2.36 million foreign investment in 2021-22, USD 0.63 million in 2020-21, USD 2.20 million in 2019-20, USD 2.18 million in 2018-19 and USD 0.01 million in 2017-18, according to data provided by Minister of State for Commerce and Industry Som Parkash in a written reply to the Rajya Sabha.

He said to promote FDI, the government has put in place an investor-friendly policy, wherein most sectors, except certain strategically important ones, are open for 100 per cent FDI under the automatic route.

"Further, the policy on FDI is reviewed on an ongoing basis, to ensure that India remains an attractive and investor-friendly destination and this has resulted in the increasing trend of FDI inflows into the country since the last eight years," Parkash added.

In a separate reply, the minister said total FDI inflow of USD 62.38 billion has been reported in the country during 2022 (up to September).

https://economictimes.indiatimes.com/news/defence/india-receives-usd-3-21-mn-fdi-in-defence-industries-during-apr-sep-fy23/articleshow/96454017.cms

FINANCIAL EXPRESS
Read to Lead

Sat, 24 Dec 2022

Revolutionising the Indian Navy's Submarine Fleet: Shift to Li-Ion Batteries

By Huma Siddiqui

The Indian Navy was looking for a technology that had the potential to improve the performance of its conventional submarines – submarines that do not carry nuclear weapons.

In October the Indian Navy issued a request for information (RFI) looking for the development of a lithium-ion battery system with "high capacity." The Navy is interested in having the capability to retrofit the technology onto their existing fleet of submarines that use lead-acid batteries. The lithium-ion battery project would have a timeframe of twenty months, beginning with the awarding of the contract, according to the timeline that the Indian Navy established.

The Indian Navy's submarine fleet modernisation programme primarily emphasises learning from the experiences of other navies, namely those of Japan and South Korea. In March 2020,

the Japan Maritime Self-Defense Force was the first to adopt lithium-ion battery technology on its submarines. More precisely, this innovation was implemented on the Soryu-class JS Ouryo submarine. Lithium-ion batteries are going to be installed in all of the submarines of the Soryu class as well as the upcoming Taigei class. South Korea subsequently took the same path. The KSS III Batch 2 submarines are also planned to be equipped with lithium-ion batteries.

Last year it was reported that the Korean shipbuilders would offer the Indian Navy an upgraded version based on the KSS III programme for the P75I submarine building programme. During the Indian competition for the P-75I submarine project, South Korea suggested offering lithium batteries as an alternative to the more conventional lead-acid batteries. According to a spokesman of the South Korean shipbuilding business DSME, the vessel stays submerged for a longer period than was previously thought. He said that the company had replicated the submarine's battery system and had already completed quality control testing. The company had also announced its plans to integrate this system into the second batch of Dosan Ahn Changho-class submarines. According to reports South Korean lithium batteries are more efficient than traditional lead-acid batteries.

The Chinese also intend to equip their submarines with lithium-ion batteries. In the event of a military attack against Taiwan to seize control of the island that has been autonomous since 1949, the Chinese Navy's submarine force will be called upon to play a strategic role, especially in repelling any US or NATO fleets that may come to Taiwan's aid. People's Liberation Army Navy (PLAN) submarines would be required to identify and assign targets to China's long-range anti-ship systems, such as the DF- 21D and DF-26, as well as direct attacks by Chinese long-range bombers, in the absence of sufficient aircraft carriers and tanker aircraft to provide a naval and air blockade capable of withstanding Western powers. The Chinese fleet can only rely on its Type 09-III Shang and Shang-G class nuclear submarines for this job, which is not ideal because they are needed for other roles.

Consequently, it must rely on its fleet of conventionally powered submarines. Even the 20th Yuan of the Type 039A class, which is equipped with an AIP (Air Independent Propulsion) system derived from the Stirling system, will be in a perilous position due to AIP's poor speed. According to the Hong Kong-based publication South China Morning Post (SCMP), the Chinese Navy may soon begin installing lithium-ion batteries instead of the nearly century-old lead-acid batteries in its conventionally-powered submarines.

The same holds true for the submarines of the Indian Navy. Cutting apart the current submarines and installing an AIP module would worsen the dearth of submarines and slow them down. Due to the AIP condition, the schedule for the P75I submarine project was also pushed back. Lithium-ion batteries are simpler to install in the present and future submarines than the cumbersome and slow AIP systems. AIP systems are more suitable for navies with coastal operations than for the Indian Navy, which must operate its submarines for extended periods and as far as the Strait of Malacca, some 2900 kms from India.

Possible contenders

In addition to Japan and South Korea, Germany and France have evaluated and studied the benefits of lithium-ion batteries, but they have yet to be implemented in submarines in service.

The Naval Science and Technological Laboratory (NSTL), Visakhapatnam, a Research & Development Laboratory under DRDO, has also developed a High Power Li-ion Battery

Technology and possesses the knowledge of numerous technologies relevant to its creation. According to DRDO rules, it is planned to convey the base technology to interested manufacturing industrial partners via the Transfer of Technology. NSTL has recently solicited Expressions of Interest (EOI) from Indian battery manufacturers with sufficient experience, expertise, and willingness to absorb technology transfer and undertake production, certification, and supply of Lithium-ion (Li-ion) battery systems based on the High Power Lithium-ion Battery Technology (HPLBT). According to the EOI, 25 Ah Li-ion cells must be manufactured, tested, and evaluated to certify their safe operation in Defense applications.

Li-ion batteries for Submarines

There are indications that the adoption of lithium-ion batteries has allowed the Japanese 29CC Soryu class submarine to reduce charging time to less than one hour and double its range. According to reports, both high and low-speed performance has been significantly boosted. However, no verified data is available on the performance of the Li-ion batteries on submarines.

https://www.financialexpress.com/defence/revolutionising-the-indian-navys-submarine-fleet-shift-to-li-ion-batteries/2925525/

mint

Sat, 24 Dec 2022

India to Receive 3rd Squadron of S-400 Air Defence Missile from Russia Next Year

Russia will begin supplying India with the third squadron of the S-400 air defence missile system in January or February of next year, despite its ongoing conflict with Ukraine. ANI reported defence forces saying, "Indian teams including Air Force personnel were in Russia for the equipment. The supplies for the third squadron are planned to begin from early next year in the January-February timeframe."

According to the sources, the only problem preventing the two countries from exchanging supplies is payment due to international sanctions against conducting financial transactions with Russia. India has already put its first two missile system squadrons into service. The first two squadrons have been sent out to patrol the Ladakh sector, as well as West Bengal's delicate Chicken's Neck Corridor and the entire northeastern region.

The system can engage enemy fighter jets, unmanned aerial vehicles, ballistic and cruise missiles, and cruise missiles with a range of up to 400 kilometres. India and Russia have agreed to a three-year, more than ₹35,000 crore deal for India to buy five squadrons of S-400 air defence missiles, and all deliveries are anticipated to be completed by the end of the following fiscal year. The Indian Air Force, which recently received the indigenous MR-SAM and Akash missile systems as well as the Israeli Spyder quick reactions surface to air missile systems, believes the S-400 will change the game. The Indian Air Force has significantly improved its air defence capabilities in recent years.

The S-400 missile systems have also participated in exercises, and according to sources, the adversaries have been alarmed by this because they are aware of the Indian system's superior

capabilities to those of the Chinese system. Presently, the S-400 air defence systems of China and India are each stationed along the Line of Actual Control. The missiles' deployment was designed to ensure that they would completely cover the northern to eastern sector with China. In light of the current international situation, the Russians are taking no chances as they ship and fly the system to India.

The joint production of the AK-203 assault rifles in Amethi is another joint effort between India and Russia, and some of the Russian machinery has already arrived at the production site. All three forces heavily relied on military supplies, with Russia serving as one of India's major suppliers of weaponry. In the recent years, India has acquired weapons from both Russia's rival, the US, and other European nations, including France. However, the Air Force and the Army still have more than 50% critical fighting systems from Russia.

https://www.livemint.com/news/india/india-to-receive-3rd-squadron-of-s-400-air-defence-missile-from-russia-next-year-11671882963978.html

ThePrint

Sat, 24 Dec 2022

'India, Kazakhstan Armies' Joint Millitary Drills 'KAZIND' will Boost Bilateral Ties'

As part of military diplomacy and to strengthen the growing strategic relation with Kazakhstan, Indian Air Force Mi-17 helicopters carried out heliborne operations with troops of the Indian and Kazakhstan Armies as part of 'Exercise KazInd' in the Eastern sector on Saturday. In September last year, India and Kazakhstan completed the 5th edition of the annual bilateral joint exercise KAZIND-21, strengthening military diplomacy between the two countries.

The Indian Army contingent was represented by a battalion of The Bihar Regiment consisting of a total of 90 personnel led by a Contingent Commander. The Kazakhstan Army is represented by a company in the 5th edition of the joint military exercise, a statement said. The exercise is a joint training between both Armies, which will boost the bilateral relations between India and Kazakhstan, it added.

The scope of the Joint Exercise includes professional exchange, planning & execution of the operation in a counterterrorism environment at the sub-unit level and sharing expertise on skills at arms, combat shooting and experiences in Counter Insurgency/ Counter-Terrorism operations. The conduct of the joint exercise will set the stage for greater defence cooperation and manifest into stronger ties between the two great nations, it said.

https://theprint.in/india/india-kazakhstan-armies-joint-millitary-drills-kazind-will-boost-bilateral-ties/1280210/

Business Standard

Sat, 24 Dec 2022

US President Joe Biden Signs $858 Billion Defence Authorization Bill

US President Joe Biden on Friday signed the USD 858 billion annual defence authorization bill after Congress approved the legislation just before the year-end, The Hill reported. Biden in the statement noted that the act will provide benefits and enhance access to justice for defence personnel and their families. "Today, I have signed into law H.R. 7776, the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 (the Act).

The Act authorizes fiscal year appropriations for the Department of Defense, for Department of Energy national security programs, and for the Department of State, Department of Homeland Security, and the Intelligence Community," Biden said in a statement.

According to the statement released by White House, Biden said the Act provides vital benefits and enhances access to justice for military personnel and their families, and includes critical authorities to support the country's national defence, foreign affairs, and homeland security. Biden noted that there are "certain provisions of the Act" which raise concerns." He stressed that the measures include a provision that continues to bar the use of funds appropriated to the Department of Defence to transfer Guantanamo Bay detainees to the custody or effective control of certain foreign countries. It also has a provision to continue to ban the use of such funds to transfer certain Guantanamo Bay detainees into the United States. He stated that certain provisions of the Act raise constitutional concerns. He called on Congress to eliminate these restrictions at the earliest.

"In some circumstances, these provisions could make it difficult to comply with the final judgment of a court that has directed the release of a detainee on writ of habeas corpus, including by constraining the flexibility of the executive branch with respect to its engagement in delicate negotiations with foreign countries over the potential transfer of detainees. I urge the Congress to eliminate these restrictions as soon as possible, " Biden said. As per The Hill report, the measure provides USD 45 billion for defence than called for in Biden's budget. The measures include allocating USD 817 billion to the Department of Defence and USD 30 billion to the Department of Energy.

Biden's authorization comes after the Senate passed the National Defense Authorization Act (NDAA) with a bipartisan majority, according to the news report. The bill has been named the "James M. Inhofe National Defense Authorization Act for Fiscal Year 2023" after retiring Senator James Inhofe.

https://www.business-standard.com/article/international/us-president-joe-biden-signs-858-billion-defence-authorization-bill-122122400105_1.html

THE HINDU

Sat, 24 Dec 2022

China Blasts U.S. Defence Bill while Taiwan Welcomes it

China blasted an annual U.S. defence spending bill for hyping up the “China threat" while Taiwan welcomed the legislation, saying it demonstrated U.S. support for the self-governing island that China says must come under its rule. “China deplores and firmly opposes this U.S. move,” the Foreign Ministry said in a statement posted online Saturday, calling the new law a serious political provocation that blatantly interferes in China's internal affairs.

President Joe Biden signed the $858 billion defence bill into law in Washington on Friday. It includes about $45 billion more than Mr. Biden had requested as lawmakers look to offset inflation and boost the nation’s military competitiveness with China and Russia. The bill also repealed a COVID-19 vaccination requirement for U.S. troops. In the Indo-Pacific region, the legislation authorizes increased security cooperation with Taiwan and requires expanded cooperation with India on emerging defense technologies, readiness and logistics.

A Taiwan Foreign Ministry statement thanked the U.S. Congress “for showing the great importance it attaches to Taiwan-U.S. relations and strengthening Taiwan’s security.” China objects to U.S. support for Taiwan, an island of 23 million people off its east coast. The two split during the civil war that brought the communists to power in China in 1949. The Chinese Foreign Ministry statement said the U.S. defence bill “severely affects peace and stability across the Taiwan Strait." China staged major military exercises around Taiwan in August after U.S. House Speaker Nancy Pelosi visited the island. The Chinese military sent 39 planes and three ships toward Taiwan earlier this week in a relatively large show of force.

https://www.thehindu.com/news/international/china-blasts-us-defence-bill-while-taiwan-welcomes-it/article66301086.ece

THE HINDU

Sun, 25 Dec 2022

Patriot System: America’s Missile Defence Umbrella

By Stanly Johny

When Russia launched its invasion of Ukraine on February 24, not many thought that the war would last this long. But 10 months later, it is still raging with surprisingly high-performing Ukrainian troops maintaining the offensive pressure against the Russians on the frontlines in the east and the south. In recent months, Ukraine took back swathes of territories it had lost to the Russians in the early stages of the war, including parts of Kharkiv Oblast in the northeast and Kherson in the south, the first city that fell to the Russian hands. Military and financial support from the West, particularly the United States, has been critical in Ukraine’s successful counteroffensive.

When the war began, the U.S. mobilised the West under its leadership against Russia and imposed tight sanctions on Moscow, besides sending ammunition to Ukraine. Months later, after Ukraine lost territories along the border region, including Mariupol, Severodonetsk and Lysychansk, the U.S. decided to send medium-range rocket systems such as HIMARS (High Mobility Artillery Rocket Systems) and MLRS (multiple launch rocket systems), which helped Ukraine turn around the battlefield momentum. After suffering setbacks in Kharkiv and Kherson, Russia launched a new phase of air strikes, targeting military and energy infrastructure in Ukraine, which strengthened Kyiv's calls for advanced defence systems. After much debate, the U.S. finally announced that it would send the Patriot, its most advanced ground-based air defence system, to Ukraine. U.S. President Joe Biden made the formal announcement, as part of a new $1.8 billion aid package, when his Ukrainian counterpart Volodymyr Zelensky visited Washington last week, his first foreign travel after the war began.

The Patriot is one of the most sought-after defence systems and has been deployed in 18 countries, including the U.S. It is operational across the NATO geography and is in high demand in West Asia, where America's allies such as Saudi Arabia, the UAE and Israel, all facing a common foe in Iran, have been using it. Now, Ukraine can be added to the list. Initially developed as a system to intercept high-flying aircraft, by U.S. aerospace and defence giant Raytheon Technologies Corp., the Patriot (Phased Array Tracking Radar to Intercept on Target) was modified in the 1980s to focus on other threats such as ballistic missiles. The programme's roots can be traced back to the 1960s when the Pentagon was looking to replace the HAWK and Nike-Hercules air defence systems.

Currently, Patriot batteries can defend against ballistic missiles, cruise missiles, drones, jets and "other threats", but it doesn't offer protection against low-flying small drones. A mobile Patriot system includes a control centre, a radar station to detect threats, missile launchers to take out those threats and other support vehicles. It can launch different types of interceptor missiles: The older PAC-1 and PAC-2 interceptors used a blast-fragmentation warhead, while the newer PAC-3 missile has a more advanced hit-to-kill technology. According to NATO, the Patriot system's radar has a range of over 150 km and it can track over 50 potential targets at the same time. One system typically has eight launchers with each holding between four and 16 ready-to-fire missiles. According to the U.S.-based Centre for Strategic and International Studies (CSIS), the U.S. Army is set to replace the legacy Patriot radar, which has a field of view limited to about 120 degrees, "with the Lower Tier Air and Missile Defense Sensor (LTAMDS), which has 360-degree coverage and multimission applications..."

Trial by fire

Though the Patriot was deployed in Europe in the 1980s against potential threats from the Soviet Union, the system was tested in combat for the first time in the First Gulf war (1990-91.) The batteries were deployed to protect Saudi and Israeli cities against Iraqi aircraft and Scud and al-Husseini short-range ballistic missiles. Throughout the war, Patriot missiles engaged over 40 Iraqi attacks. Its success rate is still debatable, but the war was a trial by fire for the Patriots and its developers. Raytheon would continue to update the weapon, which would be deployed against Iraq again in 2003 during the U.S.'s illegal invasion of the country. During this war, the Patriot's PAC-3 and other interceptors showed a better success rate against the Al-Samoud 2 and Ababil-100 tactical ballistic missiles. The post-2003 picture is rosier. Israel claims the Patriot has destroyed dozens of missiles and drones in recent years. According to Raytheon, it has intercepted more than 150 ballistic missiles in combat since 2015.

Raytheon has built more than 240 Patriot systems so far. The Patriot production lines are still active, but mostly for supplies for America's partners. One battery could cost over $1 billion — $400 million for the system and about $700 million for the missiles. The advanced PAC-3 Missile Segment Enhancement (MSE) costs about $4.1 million apiece. The older PAC-2s cost roughly half of that. Since it's a complex system, its transfer and the training of (Ukrainian) troops to operate it would take time (under normal circumstances, up to six months). According to Reuters, the U.S. is planning to ship the battery to its base in Germany where it would speed-train Ukrainian troops. Each unit needs at least 90 soldiers to operate.

Game changer?

Russia has denounced the U.S. move and threatened consequences, but the Biden administration has maintained that the supply of the Patriot is aimed at strengthening Ukraine's defences, not at escalation. The system could indeed strengthen Ukraine's defences, but it's hardly a game changer. First of all, the full deployment of the Patriot is still months away and Russia will continue to enjoy its air superiority throughout winter. Even when it's fully deployed, one battery can protect only a small territory. Even in that defended territory, Ukraine will have to use the missiles judiciously. "The high cost per missile and the relatively small number of missiles in a battery means that Patriot operators cannot shoot at every target. High-value Russian aircraft and ballistic missiles would be appropriate targets. Shooting $4 million missiles at $250,000 Russian cruise missiles might be justified if those missiles would hit sensitive targets. Shooting a $4 million missile at a $50,000 Iranian Shahed-136 drone would probably not," writes the CSIS.

But what's more significant is the message Washington is sending to Russia. A few days before the war began in February, the U.S. had shut its Embassy in Kyiv and moved the mission to the west, on the Polish border. When Ukrainian forces survived Russia's initial thrust, the U.S.'s appetite for risks grew with more weapons starting to flow in. Then the U.S. started supplying medium-range rockets neutralising Russia's artillery advantage and helping Ukraine beat Russians back in some areas. Now, the U.S. is sending its most advanced defence system. As the war grinds on, the U.S.'s role in it is steadily expanding, even at the risk of escalation. That's the message for the Kremlin.

https://www.thehindu.com/news/international/patriot-system-americas-missile-defence-umbrella/article66302270.ece

The EurAsian Times

Sun, 25 Dec 2022

Competitor to India's LCA Tejas, Turkey's Historic Light Attack Aircraft Hurjet Leaves the Hangar!

By Ashish Dangwal

Turkey's first self-produced basic trainer and light attack aircraft Hürjet has finally left the hangar, indicating that its development is proceeding without any major hiccups. In a video on the internet, the Hürjet prototype can be seen being pulled out of the hangar by a tow tractor. The

aircraft, developed by Turkish Aerospace Industries, is one of the most ambitious projects of Turkish aviation. The Hurjet prototype, slated to make its first flight in 2023, does not yet have its engines installed. However, the ground testing of the aircraft will begin as soon as the engines are installed. Besides that, the aircraft's electronic systems are also planned to be tested shortly before the TAI Hurjet's first flight. That being said, the recent development is a critical step in meeting the crucial deadline for the aircraft's development.

The Hurjet, a supersonic trainer aircraft, will be the successor to the turboprop Hurkus. Initially, the Hurjet's first flight was scheduled for 2022, but it is now anticipated to take place in 2023. As previously reported by the EurAsian Times, Turkey authorized serial production of the aircraft in January 2022.

The Hurjet will replace Turkey's outdated Northrop F-5 fighters and T-38 Talon trainers in service. One of those F-5s crashed on December 6, 2022, after one of the aircraft's engines lost power due to a collision with a bird. This comes after a video published in November revealed that the first TF-X prototype is starting to take shape on the assembly line. According to reports, Turkey plans to complete the first prototype in 2023, which analysts suggest may be an incredibly optimistic deadline. TAI exhibited a mockup of the TF-X during the Paris Air Show in June 2019. TAI President & CEO Temel Kotil stated that it will be "the best fighter aircraft in Europe" and that the prototype will fly in 2025. Currently, it's anticipated that the TF-X prototype will fly for the first time between 2025 and 2026 and that the first production aircraft will leave the factory in the early 2030s. However, even that prediction may ultimately prove to be too optimistic.

Experts also predict that Ankara will compromise on the aircraft's stealth capabilities to start serial production on schedule. Because of this, the initial models will, at best, be highly advanced 4.5-generation aircraft.

A Competitor To India's Tejas

The Hurjet, like other supersonic trainers, can also be used as a light combat aircraft. It has a top speed of Mach 1.2 and a ceiling of 45,000 feet. TAI started the Hurjet program in 2018. The aircraft is designed to carry a maximum payload of 3,000 kilograms, which may include munitions, radar equipment, and a camera. Hurjet is a single-engine tandem-seat trainer aircraft with modern avionics and high-performance characteristics. The aircraft is intended to perform an essential part of contemporary pilot training. The combat variant is a battlefield force multiplier because of its diverse range of mission capabilities and large payload. These capabilities place it in the same category as the M-346 Master from Italy, the Tejas from India, and the T-50 Golden Eagle from South Korea. It is worth noting that the Turkish defense firm has also submitted a proposal on a light combat aircraft (LCA) tender for the Royal Malaysian Air Force (RMAF), pitching the Hürjet.

The six contenders in the Light Fighter Jet contract competition are the Chinese JF-17, South Korean FA-50, Italian M-346, Indian Tejas, Turkish Hürjet, Russian MiG-35, and Yak-130. But, it was reported that China's JF-17 and the Russian Yak-130 are no longer in the competition.

Multiple media reports suggest that the two main rivals—South Korea's FA-50 and India's Tejas—seem to be in a tight race to win the deal. Nevertheless, Turkey expects that the Hurjet will also prove a success on the export market, maybe emulating the rising fame of Korea's T-50 and its KA-50 combat version. The Hurjet, according to Turkish procurement officials, will

have a booming export market once it has become combat-proven through its use by the Turkish military. “Ongoing negotiations [for exports] have been a booster in formalizing the government’s intention to start serial production,” a procurement official said. That being said, the rapid development of this trainer aircraft will represent a significant achievement for the nation’s aerospace industry.

https://eurasiantimes.com/competitor-to-indias-lca-tejas-turkeys-historic-light-attac/

Sat, 24 Dec 2022

British Defence Spending to Rise by More than 1 Billion Pounds, the Telegraph Reports

Britain will increase defence spending by more than 1 billion pounds ($1.21 billion) to avoid a real-terms cut over the next two years, the Telegraph newspaper reported on Saturday. Finance minister Jeremy Hunt is expected to announce the increase in his budget in the spring, it said. The newspaper said military experts estimate that the Ministry of Defence budget in 2024/25 must rise to 50.1 billion pounds from 48.6 billion to avoid a real-terms cut as inflation remains above 10%.

Hunt, in his autumn budget last month, said the government recognised the need to increase defence spending and confirmed it would maintain the budget at at least 2% of gross domestic product in line with its commitment to transatlantic alliance NATO. "We have one of the largest defence budgets in Europe and in 2020 we announced the biggest increase to defence spending since the Cold War," a government spokesperson told Reuters. Any increases to defence spending will be considered as part of the next integrated review, a document laying out Britain's defence, security and foreign policy priorities, in the spring, the spokesperson added.

https://www.reuters.com/world/uk/british-defence-spending-rise-by-more-than-1-billion-pounds-telegraph-2022-12-24/

Mon, 26 Dec 2022

Russian Troops Working 'Round-the-Clock' on New Air Defence Positions: Report

Russians troops are working "round-the-clock" at new anti-aircraft missile system positions, it was reported. This comes as the troops attempt to defend themselves against missile and air strikes by Ukraine, Russian Interfax reported citing the defence ministry. The report added that crews of the S-300V systems were "mastering new position areas" of the Russian long range surface-to-air missile systems.

"The air defence units of the Western Military District continue to serve in the new position areas on combat duty around the clock," the agency cited the ministry as saying, Reuters reported. Additionally, Interfax reported that the S-300V battery is capable of tracking a target at a distance of up to 204 km (127 miles) and at an altitude of up to 30 km (18.6 miles).

This comes as Russian forces bombarded many towns in Ukraine on Christmas Day while Russian president Vladimir Putin said he was open to negotiations. Russia on Sunday launched more than 10 rocket attacks on the Kupiansk district in the Kharkiv region, shelled more than 25 towns along the Kupiansk-Lyman frontline, and in Zaporizhzhia hit nearly 20 towns, Ukraine's top military command said.

"We are ready to negotiate with everyone involved about acceptable solutions, but that is up to them - we are not the ones refusing to negotiate, they are," Vladimir Putin said in an interview. An adviser to Ukrainian president Volodymyr Zelensky said Vladimir Putin needed to return to reality and acknowledge that it was Russia that did not want talks. “Russia single-handedly attacked Ukraine and is killing citizens. Russia doesn't want negotiations, but tries to avoid responsibility,” the adviser, Mykhailo Podolyak, tweeted.

https://www.hindustantimes.com/world-news/russiaukraine-war-russian-troops-working-round-the-clock-on-new-air-defence-positions-report-101672027517110.html

Science & Technology News

Press Information Bureau
Government of India

Ministry of Science & Technology

Fri, 23 Dec 2022

15 Start-Ups Selected in First Cohort of Nirman Accelerator will Work towards Solutions in Healthcare and Agriculture

Fifteen Start-ups selected in the first-of-its-kind product accelerator program for innovators developing sustainable solutions will soon start working towards solutions in the healthcare and agriculture domains. This is the first cohort of the NIRMAN Accelerator Program launched by Start-ups Incubation and Innovation Centre (SIIC) IIT Kanpur. The accelerator program supported by the Department of Science and Technology (DST), Govt. of India, through its NIDHI scheme portfolio, will help solve challenges in the product development journey of indigenous innovations. The programme takes a leaf out of the best methods and key insights from the 2 very successful national initiatives of SIIC IIT Kanpur, The Ventilator Project and Mission Bharat O2.

The calls for the programme were launched in July 2022, and the start-ups were selected through rigorous screening. This was followed by training, including residential workshops for getting the start-ups geared up to meet the challenges ahead. The first 3-day residential workshop for

the startups provided the startups with a better understanding of funding opportunities, compliance & business opportunities for health tech and agritech startups, Angel and VC funding for early-stage startups, compliance through Central Drugs Standard Control Organisation (CDSCO), ISO and Government e-Marketplace (GeM) and ethos associated with team building. Representatives from VCs like growX, YourNest, corporates like DS Group, and government agencies like TDB, GeM shared their insights and learning with the startup founders in this program. Startups under the cohort got opportunities to interact with eminent speakers from government agencies, Angel Investors and VC communities, and prominent industry leaders. Dr. Anita Gupta, Head NEB Division DST, underlined this program's importance in strengthening the country's innovation ecosystem and creating startups focusing on areas of national importance. Regarding the program's response, Prof. Abhay Karandikar, Director IIT Kanpur, said, "NIRMAN Accelerator Program is expected to expedite the journey of startups developing cutting-edge, technology-driven innovations in these critical areas from prototype to market." The cohort was encouraged to address the pertinent challenges of the Indian hardware sector through their innovative solutions. The accelerator program will enable comprehensive nurturing and fostering of the start-ups through effective mentoring and market access, and with the completion of the training period this month, the start-ups will get launched in their journey towards indigenous innovations. The programme can build focused solutions to accelerate the journey of indigenous solutions from India to build a sustainable world.

https://pib.gov.in/PressReleasePage.aspx?PRID=1885923

Press Information Bureau
Government of India

Ministry of Science & Technology

Sat, 24 Dec 2022

New Artificial Nanostructures for Infrared Absorption Technologies can be Useful in Defense, Imaging & Sensing

A new method to confine and absorb infrared (IR) light with GaN nanostructures can help develop highly efficient infrared absorbers, emitters, and modulators that are useful in defense technologies, energy technologies, imaging, sensing, and so on. GaN, a widely used material for blue light emission, is one of the most advanced semiconductors. Though visible and ultraviolet light applications of GaN have already been realized, with LEDs and laser diodes commercially available, utilization of GaN for IR light harvesting or development of GaN-based IR optical elements is lacking.

Researchers in Bengaluru's Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute of the Department of Science and Technology, have shown for the first time infrared light emission and absorption with GaN nanostructures. Though blue light emission from GaN has been known for some time, and it is used in LEDs, this is the first time that infrared light-matter interactions are demonstrated in GaN. For this demonstration, they have utilized a scientific phenomenon called surface polariton excitations in GaN nanostructures that lead to light-matter interactions at IR spectral range.

Surface polaritons are special modes of electromagnetic waves traveling at the interface of a conductor and an insulator such as air. By altering the morphology and shape of the nanostructures, they are also able to excite plasmon polaritons in GaN, which results in extending the light-matter coupling to further reaches of the electromagnetic spectrum. These polaritons are quasi-particles which have both light and matter characteristics.

To grow these GaN nanostructures, the researchers utilized a specialized material deposition instrument called molecular beam epitaxy in the International Centre for Materials Science in JNCASR. This instrument uses ultra-high vacuum, similar to the conditions of outer space, to grow high-quality material nanostructures with dimensions about 100000 times smaller than the width of a human hair.

Such cutting-edge materials allow the creation of polariton-based devices, which offer several advantages to conventional electronic devices. Polaritonic technologies have attracted a wide range of applications, such as secure high-speed light-based communication (LiFi), next-generation light sources, solar energy converters, quantum computers, and waste-heat converters. "In the last 25 years, blue LED with GaN has changed our world significantly. While the blue light emission from GaN is well-understood, utilizing GaN for infrared optics is not well-established. Our work demonstrates a novel pathway for utilizing GaN in infrared nanophotonic applications. Importantly, the scientists said that the infrared surface polariton excitations that we have demonstrated can be translated to many other semiconductors as well". The research has been published in the prestigious journal Nano Letters. The proof of concept of the technology has been demonstrated. "This work will greatly benefit in addressing the demand for IR sources and detectors for energy, security, imaging, and other applications," said Dr. Bivas Saha, Assistant Professor at the Jawaharlal Nehru Centre for Advanced Scientific Research.

Publication link:

https://pubs.acs.org/doi/pdf/10.1021/acs.nanolett.2c03748

https://pib.gov.in/PressReleasePage.aspx?PRID=1886246

Press Information Bureau
Government of India

Ministry of Science & Technology

Sat, 24 Dec 2022

Organic Solar Cells Developed on Steel Substrates can Convert a Steel Roof into an Energy-Producing Device

An organic solar cells consisting of a combination of an organic polymer and PCBM (an organic semiconductor) developed on steel substrates can potentially convert a steel roof into an energy-producing device with greater efficiency than those currently available in the market. The potential of third-generation solar cell technologies lies in their integration with flexible and conformal surfaces. However, this integration requires developing new top transparent conducting electrodes as alternatives to indium tin oxide, an optoelectronic material currently in use and poses limitations because of its brittleness and as its optoelectronic efficiency varies with temperature.

Researchers at IIT Kanpur have developed organic solar cell devices consisting of a blend of organic polymer PTB7 as a donor and PCBM as an acceptor. The devices were fabricated on opaque steel substrates with a MoO3/Au/MoO3 top electrode. The research carried out at the laboratory of Prof. Ashish Garg at IIT Kanpur demonstrated the integration of multi-layered electrodes of configuration MoO3/Au/MoO3 with the organic solar cells. It was published in the journal 'Energy Technology'. These electrodes offer higher optical transmission as compared to only metallic electrodes. The devices with multilayer electrodes showed a clear improvement in the photovoltaic performance by 1.5 times, as compared with those obtained with single-layer top metal electrodes of gold.

The materials and device fabrication of perovskite and organic solar cells took place in the Class 10000 clean room facility at IIT Kanpur, which was supported by funding from DST under the DST-RCUK APEX project. The facility can carry out the complete fabrication of organic and perovskite solar cells. It consists of two interconnected 4-port glove boxes maintained under a nitrogen gas environment, has the capacity for handling chemicals that are sensitive to atmospheric components, mainly moisture and oxygen, and has a vacuum annealing chamber. The glove box is integrated with a spin coater, a solar simulator, a thermal annealing setup, and a high-vacuum multi-channel thermal evaporator.

Publication Link: https://doi.org/10.1002/ente.202100689

https://pib.gov.in/PressReleasePage.aspx?PRID=1886244

THE HINDU

Sat, 24 Dec 2022

Two UoH Professors Bag Visitor's Awards for Technology and Research

Professors K.C. James Raju and Surajit Dhara from the School of Physics, University of Hyderabad (UoH), have been adjudged the best entry for 7th Visitor's (President of India) Awards 2021 under the category Visitor's Award for Technology Development and Visitor's Award for Research (Physical Sciences) respectively. This is the first time two UoH professors have been selected for this award in the same year. Earlier, one faculty each were awarded in 2018 and 2020. Vice-chancellor of the university B.J. Rao said that it was a historic moment when two Visitor's Awards have been given to UoH faculty in the same year and that too, from the School of Physics.

Prof. Raju did his Ph.D from IIT Madras and won the Best Thesis Award in the process. As part of his Ph.D, he developed Microwave Dielectric Resonators for DRDO. He joined the university in 1996, becoming the first faculty of the Electronics Programme of the School of Physics. The programme was later developed into CASEST in 2014 under the School of Physics. He also received the prestigious Abdul Kalam Technology Innovation National Fellowship from the Indian Academy of Engineering for the year 2021-22.

Dr. Dhara obtained his PhD from Raman Research Institute in Bangalore. He has carried out inventive research and made outstanding contributions in emerging and diverse areas of Liquid Crystal science and technology. He was selected for the prestigious Shanti Swarup Bhatnagar (SSB) prize for Science and Technology in 2020. The President of India, who is the visitor of Central Universities, annually confers Visitor's Awards to promote healthy competition among universities and motivate them to adopt best practices from around the world in pursuit of excellence.

https://www.thehindu.com/news/national/telangana/two-uoh-professors-bag-visitors-awards-for-technology-and-research/article66301861.ece

Hindustan Times

Mon, 26 Dec 2022

73 Species Critically Endangered in India, says Centre in Rajya Sabha

Seventy-three species in India are critically endangered, the Union environment ministry informed the Rajya Sabha citing a report of the International Union for Conservation of Nature (IUCN), up from 47 in 2011. The 73 species include nine species of mammals, 18 birds, 26 reptiles and 20 amphibians, according to IUCN criteria. IUCN, which monitors health and status of biodiversity globally, declares a species as critically endangered when it is considered to be facing an extremely high risk of extinction in the wild.

In September 2011, 47 species in India were identified as "critically endangered" in the class of mammals, birds, reptiles, fish and amphibians, according to information provided by the ministry in Lok Sabha. The government is now considering the inclusion of most critically endangered species in the Schedule-I of Wild Life (Protection) Act, 1972, to provide the highest level of protection, minister of state, environment, Ashwini Kumar Choubey told the Rajya Sabha on Thursday in response to a question by Congress MP Mukul Wasnik. Wasnik asked if the government has any plans for the protection and conservation of the critically endangered species. To this, Choubey said that out of the nine species of mammals considered critically endangered, eight are endemic, which means that their habitat is limited to a small geographic area within India. These include the Kashmir Stag/Hangul, Malabar Large-spotted Civet, Andaman Shrew, Jenkin's Shrew, Nicobar Shrew, Namdhapa Flying Squirrel, Large Rock Rat and Leafletted Leafnosed Bat.

The 18 critically endangered bird species include Baer's Pochard, Great Indian Bustard, Sociable Lapwing, Red headed Vulture, the White Rumped Vulture, Indian Vulture and Slender billed Vulture. Of the 26 reptile species, five are endemic to India including Island Pit Viper whose habitat is limited to a single location in the Car Nicobar Island. Among amphibians, several species are limited to habitats in the Western Ghats, the northeast, and Andaman and Nicobar Islands. The Charles Darwin's Frog for example in Andaman has an extent of occurrence less than 100 square km, its distribution is severely fragmented, and there is a continuing decline in the area. The Dattatreya Night Frog has an extent of occurrence of less than 30 square km with all individuals in a single threat-defined location according to the MoEFCC.

The Centre has been monitoring these species through various projects. For instance, the department of science and technology supported a project on the White-bellied Heron in Namdapha Tiger Reserve, Arunachal Pradesh, to study their foraging behavior. The species is only found in Arunachal Pradesh and Assam. At present, the global population of this species is less than 60 individuals, with just 15 in protected area in India, the ministry informed Rajya Sabha.

MoEFCC has also proposed that endangered species be included in various appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) to curb trafficking. The details provided by Choubey are critical in view of the Kunming-Montreal Global Biodiversity Framework which was adopted at the UN Biodiversity Summit (COP15) last week. Under the deal, 196 members countries agreed to protect 30% of the world for nature by 2030, reduce environmentally harmful subsidies by at least $500 billion a year, and restore at least 30% (by area) of degraded ecosystems.

Experts said that most of India's biodiversity is outside India's protected areas. "Even though the 30% coverage under conservation applies globally and not to individual countries, in India for certain biomes where the absolute area is limited, we have to possibly conserve almost 100% of what remains. Similarly, for conserving our highly endangered fresh-water aquatic fauna and the ecosystem services of riverine ecosystems, we may have to restore ecological flows and sediment regimes through alternative land-use and management of dams and barrages over more than 30% of our rivers," explained Jagdish Krishnaswamy, dean, school of environment and sustainability, Indian Institute for Human Settlements, Bengaluru, and senior adjunct fellow at Ashoka Trust for Research in Ecology and Environment.

"Only a fraction (~15%) of high priority biodiversity and conservation potential areas are encompassed under India's extant protected area network which effectively covers 5% of India. However, to achieve a coverage of 30% of our land and water under biodiversity friendly management that also generates a diversity of ecosystem services including water and carbon services and enhances our resilience under climate change besides providing adaptation capacity, we have to reimagine conservation far beyond the conventional protected area approaches. Our conservation goals must be linked to making our soils healthier, protecting our water and achieving biodiversity targets in all types of ecosystems from the so-called semi-wild areas to agro-ecosystems as well as green and blue spaces in urbanising areas and mega-cities," he added.

https://www.hindustantimes.com/india-news/73-species-critically-endangered-in-india-says-centre-in-rajya-sabha-101671991164225.html

The Tribune

Sat, 24 Dec 2022

Scientists Develop New Infra-Red Technology for Defence and other Fields that can Outperform Silicon Devices

Scientists have identified a new method to confine and absorb infrared (IR) light with nanostructures to develop highly efficient infrared absorbers, emitters and modulators that are

useful in defence technologies besides other fields like energy, imaging and sensing. Researchers at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), have established for the first time infrared light emission and absorption with Gallium Nitride (GaN) nanostructures, according to a statement issued by the Ministry of Science and Technology on Saturday.

Gallium Nitride (GaN) is a very hard and mechanically stable semiconductor. With higher breakdown strength, faster switching speed, higher thermal conductivity and lower on-resistance, power devices based on GaN significantly outperform silicon-based devices. It is widely used for blue light emission, and is one of the most advanced semiconductors. Though visible and ultraviolet light applications of GaN have already been realised with commercially available LEDs and laser diodes, utilisation of GaN for IR light harvesting or development of GaN-based IR optical elements is lacking. “In the last 25 years, blue LED with GaN has changed our world significantly. While the blue light emission from GaN is well-understood, utilising GaN for infrared optics is not well-established. Our work demonstrates a novel pathway for utilising GaN in infrared nanophotonic applications.

Importantly, the scientists said that the infrared surface polariton excitations that we have demonstrated can be translated to many other semiconductors as well," the statement said. Scientists at JNCASR used a scientific phenomenon called 'surface polariton excitations'. Surface polaritons are special modes of electromagnetic waves travelling at the interface of a conductor and an insulator such as air. These alter the morphology and shape of the nanostructures.

To make these GaN nanostructures, the researchers utilised a specialised material deposition instrument called molecular beam epitaxy. It uses ultra-high vacuum, similar to the conditions of outer space, to develop high-quality material nanostructures with dimensions about 1,00,000 times smaller than the width of a human hair. This work will greatly benefit in addressing the demand for IR sources and detectors for energy, security, imaging, and other applications,” said Dr Bivas Saha, Assistant Professor, JNCASR.

Such cutting-edge materials allow the creation of polariton-based devices which offer several advantages to electronic devices. Polaritonic technologies have attracted a wide range of applications, such as secure high-speed light-based communication (LiFi), next-generation light sources, solar energy converters, quantum computers and waste-heat converters.

https://www.tribuneindia.com/news/nation/scientists-develop-new-infra-red-technology-for-defence-and-other-fields-that-can-outperform-silicon-devices-464126

नवभारत टाइम्स

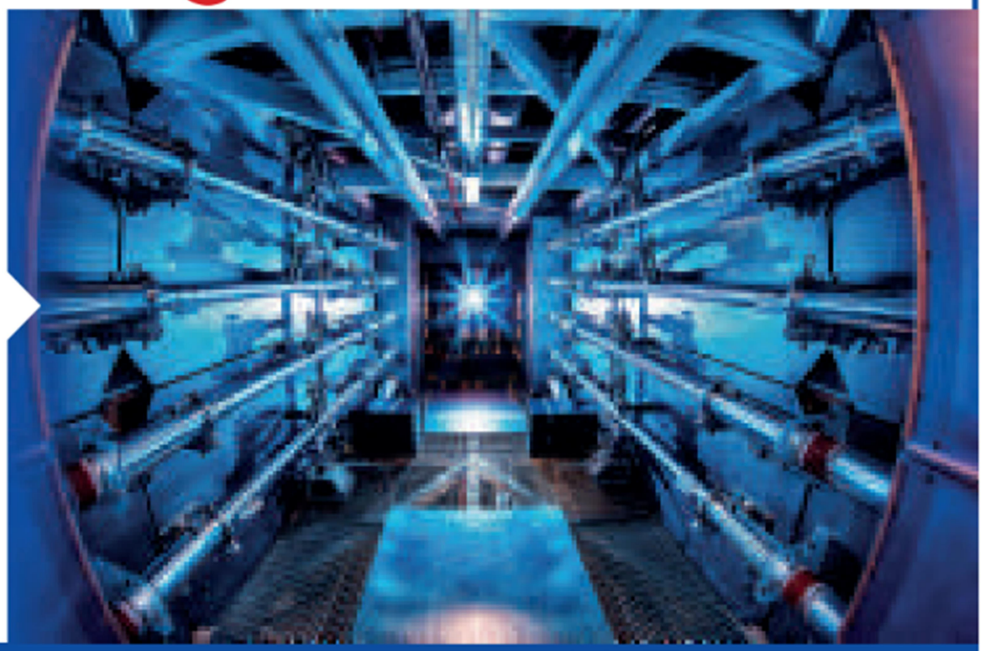
Sat, 24 Dec 2022

5G की रफ्तार और मशीनी सोच से बदलेगी दुनिया

2022 में विज्ञान और तकनीक के क्षेत्र में ऐसा क्या हुआ, जो 2023 की तस्वीर बदलने वाला है। उसके बारे में हम यहां बात कर रहे हैं। चाहे देश में 5G की शुरुआत हो या भारत के पहले प्राइवेट रॉकेट का लॉन्च, सुदूर अंतरिक्ष में स्पेसक्राफ्ट की ऐस्टरॉयड से टक्कर हो या मशीनी सोच पर आधारित तकनीक। खास बात यह कि इस रोमांचकारी साल का अंत हो रहा है बेशुमार क्लीन एनर्जी की राह खोलने वाली न्यूक्लियर फ्यूजन तकनीक की सफलता से।

अपार एनर्जी का खजाना मिला

हमारा सूरज ही नहीं, ब्रह्मांड के सभी सितारे न्यूक्लियर फ्यूजन तकनीक से ऊर्जा हासिल करते हैं। कैलिफॉर्निया की लॉरेंस नैशनल लैब में वैज्ञानिकों ने इसी तकनीक से अपार क्लीन एनर्जी बनाने में सफलता पाई। यह प्रयोग इतनी एनर्जी देने में सक्षम है कि भविष्य में पेट्रोल, डीजल, गैस जैसे एनर्जी के परंपरागत स्रोतों पर निर्भरता कम हो सकती है। इस प्रयोग की सफलता से जलवायु परिवर्तन से जंग में मदद मिलेगी। यह प्रयोग वैज्ञानिक खोजों में बड़ी सफलता में एक है।



2 या दो से अधिक एटम जब जुड़कर एक भारी एटम बनाते हैं तो यह प्रक्रिया न्यूक्लियर फ्यूजन कहलाती है।

21 लाख जूल एनर्जी इस्तेमाल हुई इस अमेरिकी प्रयोग में, बदले में 25 लाख जूल एनर्जी निकली।

1950 से इस तकनीक पर दुनिया में शुरू हुई थी रिसर्च, सफलता अब जाकर मिली है।

The Indian EXPRESS

Sun, 25 Dec 2022

China's 'Heavenly Palace' Space Station Releases Small Satellite into Orbit

China deployed a mini satellite into low-earth orbit from its Tiangong ("Heavenly Palace") space station, which was completed in October this year. The 12-kilogram satellite was developed by the China Academy of Space Technology and is called the Macao Student Science Satellite 1, according to China Daily. The Chinese Communist Party-run publication says the satellite is designed to help students in Macao learn about Erth imaging, radio communication and other spaceflight activities, quoting the China Manned Space Agency.

The satellite was carried on the Tianzhou 5 cargo spacecraft to the space station. According to China Daily, scientists have used the Tianhou-series cargo ships to transport many payloads of scientific equipment and mini-satellites to orbit to make the best use of their äbundant carrying capacity." The Macao Student Science Satellite 1 is in a roughly circular orbit with an altitude of about 385 kilometres and has been catalogued by the US Space Force's 18th Space Defense Squadron according to Space.com. The 18th Space Defense Squadron is a US Space Force unit tasked with maintaining a space object database and managing the United States Space Command's space situational awareness. The Tiangong space station has three modules—the Tianhe ("heavenly river") crew module, and the laboratory modules Wentian ("quest for heavens") and Mengtian ("dreaming of heaven"). The Tianhe core module, which launched first,

hosts living quarters for three crew members and provides many key functions of the space station, including power, propulsion, guidance, navigation and life support systems. The Wentian science module, which was launched second, also provides additional navigation, propulsion and orientation controls as a backup while functioning as a pressurised environment for researchers to conduct zero-gravity experiments. The Mengtian module, launched in October, is designed mainly for science experiments.

https://indianexpress.com/article/technology/science/china-tiangong-space-station-satellite-8343486