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Newspapers Clippings

दैनिक सामयिक अभिज्ञता सेवा

A Daily Current Awareness Service

Vol. 44 No. 240 13 December 2019

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THE NATIONAL INTEREST

Fri, 13 Dec 2019

India's Tejas Fighters are pretty good (but they are no F-35)

By Sebastien Roblin

- ***Key point: The Tejas was developed out of the Light Combat Aircraft program, which sought a replacement for the hundreds of MiG-21 fighters nearing the end of their service lives in the Indian Air Force***

In 2016 the Indian Navy rejected the domestically built Tejas jet fighter—or Light Combat Aircraft—after a troubled thirty-three years of development in which the maritime fighting branch had invested significantly. However, the Indian Navy argued that the Tejas weighed too much, and produced insufficient thrust for takeoff from the ski-jump ramp of its forthcoming aircraft carrier.

But the Indian Navy hasn't given up *entirely* on the Tejas; it is considering a Mark 2 variant under development, which will be powered by the same F414 turbofan engines as the U.S. Navy's Super Hornet fighter.

The Tejas was developed out of the Light Combat Aircraft program, which sought a replacement for the hundreds of MiG-21 fighters nearing the end of their service lives in the Indian Air Force. The single-engine Tejas has a tailless delta-wing configuration and supposedly costs only $25 million per airplane. However, it took decades for the LCA to come together, and it continued to rely heavily on foreign components, including an Israeli Doppler radar and General Electric F404 turbofan engines.

With a top speed of Mach 1.6 to 1.8, a maximum external load of 7,700 pounds and a service ceiling of fifty-two thousand feet, the Tejas remains unexceptional compared to top-performing fourth-generation light fighters such as the F-16. The Indian Air Force has only ordered 123 Tejas jets so far to equip six squadrons by 2024. HAL, however, is having difficulty ramping up production from eight aircraft a year to the desired sixteen.

On the short term, HAL seeks to improve the Tejas Mark1 by installing an Israeli EL/M-2052 Active Electronically Scanned Array (AESA) radar, jamming pods and an aerial refueling probe. This Tejas Mark 1A subvariant will make up the latter two-thirds of the Mark 1 production run.

But the Indian firm is also taking a second crack at an Indian Navy contract with its Tejas Mark 2, which will have greater thrust by swapping out the F404 turbofans (rated at eleven thousand pounds of thrust dry) with a General Electric F414. The F414 has larger fan blades and can produce thirteen thousand pounds of dry thrust. The Indian Aerial Development Agency has already devoted $542 million to the project, which dates all the way back to 2009.

After some mixed messages from the defense ministry, the Mark 2 took a major step closer to being realized in February 2017, when General Electric provided the first two F414-INS6 engines for Mark 2 test aircraft, with six more to follow. If the Mark 2 enters production, a total of ninety-nine engines may be delivered as part of a $600 million deal. The improved propulsion might not only make the Tejas Mark 2 more viable for carrier takeoff, but increase its maximum weapons-load capacity by 25 percent, to eleven thousand pounds.

The tender also stipulated transferring up to 60 percent of the F414 engine technology to India—with GE claiming it is ready to transfer more than 50 percent. This is also significant, as India's Gas Turbine Research Establishment has been working for two decades on domestic Kaveri K9 and K10 turbofans, which it hopes will one day be ready for installation on the Tejas or the HAL AMCA stealth fighter currently under development. Additional foreign technology could help spur the engines' development—indeed, after paying $2 million for consultation with a French firm, the GTRE estimates that new Kaveri engines may be ready for testing in 2019.

The Tejas Mark 2 would also come loaded with further enhancements to the avionics, most notably an Uttam AESA radar developed domestically by the Electronic Research and Development Establishment. AESA radars offers greater resolution and sensor stealth, and are considered to be the cutting of current fighter-borne radar technology. However, the Uttam currently is only geared for air-to-air operation, with an air-to-ground mode still in development.

The Tejas Mark II would incorporate the new features of the Mark 1A, as well as a new glass cockpit with an eight-by-twelve-inch multifunction display and an onboard oxygen system that collects air from the outside, removing the need for oxygen bottles. The new engine and avionics on the Mark 2 would stretch out the airframe an additional meter for a total length of 14.2 meters.

According to Defense Minister Manohar Parrikar, the Tejas Mark 2 is set to for its first flight in 2019, with production to commence in 2022, possibly following the establishment of a separate production line. The Indian Navy has expressed interest in forty-six or fifty-six carrier-based variants of the Mark 2 to enter service, while the Air Force has ordered an additional eighty-three Mark 2s to supplement its Tejas Mark 1s, though there is speculation an order as high as three hundred could follow if the Mark 2 is found to be satisfactory.

By investing in the Tejas Mark 2, the Indian Aeronautical Development Agency hopes to recoup more from the substantial time and money devoted to the Tejas fighter program in previous decades. If the new engines and radar perform as hoped, the Mark 2 may finally provide India with a decent domestic fighter jet that improves upon the Mark 1's shortcomings.

However, India isn't hedging its best purely on domestic designs—it is also looking to strike a deal to open a domestic production line for either the American F-16 Block 70 or the Swedish JAS 39 Gripen-E fighter, both of which are excellent, mature designs. New Delhi has several options as to how to increase its fighter force from the current strength of thirty-three squadrons to the desired forty-five, but which it will commit to remains to be seen.

https://nationalinterest.org/blog/buzz/indias-tejas-fighters-are-pretty-good-they-are-no-f-35-103922

THE ECONOMIC TIMES
WWW.ECONOMICTIMES.COM

Fri, 13 Dec 2019

Warship builder GRSE hands over Landing Craft Utility amphibious ship to Indian Navy

The amphibious ship, that can transport and deploy main battle tanks, armoured vehicles, troops and equipment from ship to the shore, is seventh of eight such vessels being built for the Navy by GRSE. These ships can also be deployed for multi-rol...

Kolkata: Adding to the country's maritime security prowess, warship builder Garden Reach Shipbuilders and Engineers (GRSE) has delivered a Landing Craft Utility (LCU) to the Indian Navy, GRSE said here on Thursday.

The amphibious ship, that can transport and deploy main battle tanks, armoured vehicles, troops and equipment from ship to the shore, is seventh of eight such vessels being built for the Navy by GRSE, it said in a statement.

These ships can also be deployed for multi-role activities like beaching operations, search and rescue, disaster relief operations, supply and replenishment and evacuation from distant islands, the statement said.

The LCU is 62.8 metres long, 11 metres wide and has a displacement of 830 tonnes, with a low draught of 1.7 metres, it said.

With an ability to attain a maximum speed of 15 knots, the ship can accommodate 216 personnel and is equipped with two indigenous CRN 91 guns to provide artillery fire support during landing operations, GRSE said.

The LCU Mark IV class of ships, the first of which was commissioned into the Navy in 2016, are fitted with close to 90 per cent indigenous equipment, the statement said.

The GRSE has so far manufactured 103 warships since its inception in 1960.

https://economictimes.indiatimes.com/news/defence/warship-builder-grse-hands-over-landing-craft-utility-amphibious-ship-to-indian-navy/articleshow/72494476.cms

ARMY TECHNOLOGY

Fri, 13 Dec 2019

Indian Army receives first lot of Sig Sauer assault rifles

The Indian Army has reportedly received the first lot of Sig Sauer assault rifles to boost its counter-terrorism operations.

The army has started inducting the first batch of US-made Sig Sauer SIG716 7.62x51mm assault rifles on 10 December, reported Indian news agency Asian News International (ANI).

The army's Northern Command will use the rifles for combat missions in the state of Jammu and Kashmir.

Top Indian Army sources were quoted by ANI as saying: "The first lot of 10,000 SiG 716 assault rifles has arrived in India and has been sent to the Northern Command."

Sig Sauer will soon deliver another lot of 10,000 rifles. The US firm was awarded a contract worth Rs7bn ($98.72m) to supply around 72,000 assault rifles to the Indian Armed Forces.

India is acquiring the rifles under the fast-track procurement (FTP) programme.

The new rifles will replace the existing Indian Small Arms System (Insas) 5.56x45mm rifles used by the forces and manufactured locally by the Ordnance Factories Board.

The Indian Army will get the majority of the rifles with a total of 66,000 units. The navy and the airforce will obtain 2,000 and 4,000 units respectively.

SIG716 uses the 7.62mm cartridge and provides enhanced functionality and reliability.

The rifle has an advanced operating system that decreases excessive heat and carbon fouling. It features an adjustable gas valve to increase or decrease gas flow.

The news agency also stated that the army has started receiving ammunition for its sniper rifles.

India will also manufacture AK-203 assault rifles in collaboration with Russia. The plan is to produce more than 700,000 of these rifles.

https://www.army-technology.com/news/india-sig-sauer-assault-rifles/

जनसत्ता

Fri, 13 Dec 2019

भारत और अमेरिका के बीच '2+2' वार्ता 18 को

जनसत्ता ब्यूरो
नई दिल्ली, 12 दिसंबर।

भारत और अमेरिका के बीच दूसरी '2+2' वार्ता 18 दिसंबर को वाशिंगटन में होगी, जिसमें दोनों देश रणनीतिक संबंधों के सभी पहलुओं का जायजा लेंगे। विदेश मंत्रालय के प्रवक्ता रवीश कुमार के मुताबिक, भारतीय पक्ष का प्रतिनिधित्व विदेश मंत्री एस जयशंकर और रक्षा मंत्री राजनाथ सिंह करेंगे। रवीश कुमार ने कहा, 'हमने नागरिकता (संशोधन) विधेयक पर अमेरिकी कांग्रेस के सदस्यों, अन्य हितधारकों से संपर्क किया है। उम्मीद है कि वे हमारी स्थिति को समझेंगे।' भारत-जापान शिखर सम्मेलन 15 से 17 दिसंबर तक गुवाहाटी में होगा या नहीं, इस पर उन्होंने कहा कि उनके पास साझा करने के लिए कोई जानकारी नहीं है।दूसरी ओर, अमेरिका की एक शीर्ष राजनयिक ने कहा कि भारत और अमेरिका के बीच होने वाली '2+2' वार्ता में मानवाधिकारों से जुड़े मुद्दों पर चर्चा नहीं की जाएगी, लेकिन कश्मीर से संबंधित मुद्दों पर बात होगी। दक्षिण और मध्य एशिया की कार्यवाहक सहायक विदेश मंत्री एलिस जी वेल्स ने पूर्व राष्ट्रपति ड्वाइट डेविड आइजनहावर की भारत की ऐतिहासिक यात्रा की 60वीं वर्षगांठ पर बुधवार को एक कार्यक्रम में कहा कि अगले सप्ताह हो रही 2+2 वार्ता में मानवाधिकारों पर चर्चा नहीं की जाएगी।

THE TIMES OF INDIA

Fri, 13 Dec 2019

2+2 India-US dialogue to be held on Dec 18 in Washington: MEA

New Delhi: The second two-plus-two dialogue between India and the US will take place on December 18 in Washington during which the two sides will take stock of the entire gamut of strategic ties between the two countries, the Ministry of External Affairs said on Thursday.

The Indian side will be represented by external affairs minister S Jaishankar and defence minister Rajnath Singh, Ministry of External Affairs spokesperson Raveesh Kumar said.

On whether the India-Japan summit will take place in Guwahati from December 15-17, he said there was no update to share.

Asked to comment on the cancellation of Bangladesh foreign minister A K Abdul Momen's visit and if it was a fallout of criticism of that country's treatment of minorities, he said, "We never said there was religious persecution in Bangladesh during the current government's tenure. "

Referring to Pakistan Prime Minister Imran Khan's critical comments on the Citizen (Amendment) Bill, the spokesperson said Pakistan should focus on its treatment of minorities rather than commenting on India's internal matter.

https://timesofindia.indiatimes.com/india/22-india-us-dialogue-to-be-held-on-dec-18-in-washington-mea/articleshow/72491137.cms

hindustantimes

Fri, 13 Dec 2019

India, US to sign key defence pact at 2+2 next week; Kashmir could figure

The agreement "will allow for new avenues of collaboration between our private sectors on defence research and co-development", said Alice Wells, the top US state department diplomat for South Asia and Central Asia

By Yashwant Raj

Washington: India and the United States are likely to sign a key defence agreement at the second edition of the upcoming 2+2 ministerial, which has become a "principal mechanism", as a senior US diplomat put it Wednesday, for advancing growing strategic convergence between the two countries.

The Industrial Security Annex (ISA), the defence pact the two countries will sign, according to people familiar with the preparatory discussions, will allow US companies to share sensitive, proprietary defence technology with Indian private companies and not just with Indian state-owned partners, marking another major milestone in the growing partnership between the two countries.

The agreement "will allow for new avenues of collaboration between our private sectors on defence research and co-development", said Alice Wells, the top US state department diplomat for South Asia and Central Asia. She was speaking at an event hosted by the Atlantic Council, a leading US think tank, to commemorate President Dwight Eisenhower's visit to India in 1959, the first by a sitting US president.

The annex will allow, for instance, Boeing and Lockheed Martin, the leading US manufacturers of warplanes, to seek local partners among Indian private players to mount a bid for the 114 fighter jets that the Indian Air Force is seeking to order to replace its aging fleet of Russian MiG 21s.

Wells spoke of the agreement only in general terms and gave no indication if it was to be signed in Washington DC on December 18 when Defence Minister Rajnath Singh and External Affairs Minister S Jaishankar meet their US counterparts Mark Esper and Mike Pompeo for day-long meetings including a working lunch hosted by the state department at its Foggy Bottom headquarters.

Wells set her remarks also against the backdrop of the 2+2 ministerial meeting, which she said had become the "principal mechanism under the Trump administration for translating strategic convergence into tangible outcomes".

The talks will cover cover an entire range of issues from counter-terrorism to regional connectivity (a phrase used to describe the China challenge) to Afghanistan and Jammu and Kashmir. The United States would raise it, as it appeared from Wells's remarks Wednesday.

The United States expected Indian to "release political detainees and restore normalcy", she said, adding, "Kashmiris are entitled to their full rights under the Indian constitution which respects the religious freedom of all Indians."

She acknowledged, however, the security challenges India faced there including cross-border terrorism, which has been New Delhi's key defence of the controversial restrictions.

Wells' remarks were also intended to address continuing disquiet on Capitol Hill over the Kashmir situation. She was to brief lawmakers at a closed-door meeting later in the day. Lawmakers remained concerned, a congressional aide who attended the briefing said, about the "situation in India".

The first edition of the 2+2 ministerial, which took place in Delhi, was marked by the signing of the Communications, Compatibility and Security Agreement (COMCASA), the second of the three

enabling (also called foundational) agreements the United States had been pushing India to sign for years to expand interoperability between their militaries.

The first of these pacts, the Logistics Exchange Memorandum of Agreement (LEMOA), which allows Indian and US militaries to use each other's facilities (to refuel, for instance) was signed in 2016 by then Defence Minister Manohar Parrikar and Secretary of Defence Ashton Carter. There is just one more left — Basic Exchange and Cooperation for geo-spatial cooperation.

India-US defence cooperation has developed rapidly in recent years with trade, a major component of it, going up from Indian buying zero US equipment in 2008 to around $15 billion in 2018. The two countries also conduct joint military exercises with increased frequency. They recently concluded their first tri-services exercises, called Tiger Triumph, and have participated in joint-drills with other countries in the region such as the one with Japan and the Philippines in the South China Sea in May.

https://www.hindustantimes.com/india-news/india-us-to-sign-key-defence-pact-at-2-2-next-week-kashmir-could-figure/story-nHJOGsElIqlg2N5OngS4SP.html

DefenceNews

Fri, 13 Dec 2019

Why India's Arihant-Class missile submarine is a serious problem for China

A new submarine promises to give the world's most populous democratic nation a powerful second-strike nuclear capability. The INS Arihant, India's first nuclear ballistic-missile submarine, will finally give the country nuclear weapons that could survive a surprise first strike and go on to deal a crushing retaliatory blow to the enemy. The new sub will complete India's triad of air, land and sea nuclear forces.

India tested its first weapon, an eight-kiloton device nicknamed Smiling Buddha, in 1974. Although small in yield, the device was a remarkable technological achievement that thrust the young country into the exclusive, so-called "nuclear club" that had until then consisted of the United States, Soviet Union, United Kingdom, France and China.

India is believed to have 520 kilograms of plutonium—enough for, according to the Arms Control Association, "100 to 130 warheads." New Delhi describes this a "credible minimum deterrent" against neighboring nuclear powers China and Pakistan. India has a firm No First Use policy with regard to nuclear weapons, vowing to never be the first to use them in any conflict and only use them to retaliate in kind.

Nuclear-armed submarines are an ideal basing solution for a country such as India. While less accurate than land-based missiles and less flexible than air-launched weapons, ballistic-missile submarines are the most difficult to destroy in a first strike. Hiding in the vastness of the oceans, a nuclear-armed submarine is nearly invulnerable. And, in the logic of nuclear deterrence strategy, an invulnerable nuclear arsenal makes for an invulnerable country.

The Arihant program goes back more than three decades, to the vaguely named Advanced Technology Vessel. Begun in 1974, ATV was broadly conceived as a project to research nuclear propulsion and, down the road, field a indigenously developed and constructed nuclear-powered submarine. The program was a collaboration between the Bhabha Atomic Research Centre, the Indian Navy and the Indian government's Defence Research Development Centre.

By 1995, ship-sized reactor trials were underway at the Bhabha Centre in Mumbai. According to Combat Ships of the World, the reactor had been under development since 1985, weighed 600 tons and was "entirely unsuccessful." By 1989, Russian nuclear scientists and engineers joined the project, and yet the program still failed to yield a viable reactor. In 1998, the Indian government threw in the towel and purchased a reactor design outright from Russia, and by 2004, a working eighty-megawatt prototype reactor had been built, tested and achieved criticality.

Hull began construction in 1998 at Visakhapatnam, but could not be completed due to the lack of a working reactor. The hull itself is variously reported as based on the Russian Akula/Project 971–class nuclear attack submarine or the ex-Soviet Charlie II class. Combat Fleets of the World claims it is based on the Akula, and lengthened an additional thirty feet to accommodate a missile compartment. Other sources claim it is based on the Charlie II class, one of which was leased to India from 1988 to 1991 and served as INS Chakra. At either rate, the submarine is estimated to be 330 to 360 feet long, with submerged displacement of 6,500 tons. It is the smallest ballistic-missile submarine in the world, with the possible exception of the North Korean Gorae class.

Thanks to nuclear propulsion, Arihant can do twelve to fifteen knots on the surface and twenty-four knots underwater. Maximum diving depth is unknown, and probably a closely held secret, but the

Akula class is known to dive to six hundred meters. The submarine is manned by a crew of ninety-five to one hundred.

Arihant was officially launched in 2009. The onboard reactor reached criticality in 2013, and the ship began sea trials in late 2014. It was officially commissioned into service in August 2016. According to Naval Technology, the total price tag was $2.9 billion.

Arihant's name literally translates to "Slayer of Enemies," and the ship's armament makes it the greatest concentration of firepower in Indian history. The submarine was built with four missile tubes mounted in a hump behind the conning tower. The four can carry twelve K-15 Sagarika ("Oceanic") short-range ballistic missiles. K-15 has a maximum range of just 434 miles, making it capable of hitting just the southern half of Pakistan.

Alternately, the sub can carry four K-4 medium-range ballistic missiles with a 2,174-mile range, capable of hitting targets as far away as Beijing. Both the K-4 and the K-15 are nuclear capable, but the warhead yield is unknown. India has yet to master multiple independently targetable reentry vehicle (MIRV) technology, so whatever the yield of the warhead, K-4 and K-15 carry just one of them.

In order to be credible, a seagoing nuclear deterrent must have at least one submarine on patrol at all times. The second ship in class, Aridhaman, is under construction in Visakhapatnam, and India plans to have as many as four boomers by 2020—the same number as the United Kingdom and France. With the four nuclear-armed boats completed, India may finally achieve its goal of strategic invulnerability.

https://www.defencenews.in/article/Why-Indias-Arihant-Class-Missile-Submarine-Is-a-Serious-Problem-for-China-798418

THE ECONOMIC TIMES
WWW.ECONOMICTIMES.COM

Fri, 13 Dec 2019

US reprimanded Pakistan for misusing F-16s: Report

"While we understand from you that these aircraft movements were done in support of national defense objectives, the US government considers the relocation of aircraft to non-US government authorised bases concerning and inconsistent with the F-16..

Washington: The US reprimanded Pakistan Air Force chief in August for misusing F-16 fighter jets by undermining their shared security platforms and infrastructures, a media report here has said, months after the Indian Air Force shot down an F-16 jet of Pakistan Air Force during an aerial combat over Kashmir.

Andrea Thompson, the then-undersecretary of State for Arms Control and International Security Affairs, wrote a letter to Pakistani Air Force Chief Air Chief Marshal Mujahid Anwar Khan in August over the matter, US News reported on Wednesday.

While the letter written did not directly mention the incidents in the immediate aftermath of the February 26 Balakot airstrikes, US News quoted a source as saying that the communication served as a direct response to America's concerns about the F-16 use over Kashmir in February.

"While we understand from you that these aircraft movements were done in support of national defense objectives, the US government considers the relocation of aircraft to nonUS government authorised bases concerning and inconsistent with the F-16 Letter of Offer and Acceptance," Thompson said in his letter.

A suicide bomber of Pakistan-based Jaish-e-Mohammed (JeM) terror group killed 40 CRPF personnel in Jammu and Kashmir's Pulwama district on February 14.

India launched a counter-terror operation against a JeM training camp in Balakot on February 26. The next day, Pakistan Air Force retaliated and downed a MiG-21 in an aerial combat and captured its pilot Wing Commander Abhinanadan Varthaman, who was later released.

The IAF had said that during the aerial engagement on February 27, one of its MiG-21 Bison shot down a F-16.

The Indian Air Force on February 28 displayed pieces of the AMRAAM missile, fired by a Pakistani F-16, as evidence to "conclusively" prove that Pakistan deployed US-manufactured F-16 fighter jets during an aerial raid targeting Indian military installations in Kashmir.

"Such actions could subject sensitive US-technologies to diversion to or access by third parties and could undermine our shared security platforms and infrastructures," warned Thompson, who has now left the government.

The State Department and the Embassy of Pakistan has refused to comment on the letter.

According to US News, in her letter, Thompson raised concerns about American access to the bases and the US-made equipment there.

Thompson said it had been four years since Office of Defense Representative of Pakistan – the office that carries out defense cooperation with partner countries – had been allowed to perform an assessment of the security vulnerabilities on the Pakistani bases, the news report said.

https://economictimes.indiatimes.com/news/defence/us-reprimanded-pakistan-for-misusing-f-16s-report/articleshow/72486433.cms

THE ECONOMIC TIMES
WWW.ECONOMICTIMES.COM

Fri, 13 Dec 2019

ISRO scientists unfurl antenna of RISAT-2BR1 satellite

"Today at 1400 hrs Radial Rib Antenna of #RISAT2BR1 spacecraft was successfully deployed in-orbit. This complex technology involved unfurling and deployment of the 3.6 m antenna which was folded and stowed during launch," ISRO said in an update. T..

Chennai: Scientists at the Indian Space Research Organisation (ISRO) on Thursday undertook an operation to unfurl the antenna that was inside the radar imaging earth observation satellite RISAT-2BR1, a day after it was launched from Sriharikota, around 130 kms from here.

"Today at 1400 hrs Radial Rib Antenna of #RISAT2BR1 spacecraft was successfully deployed in-orbit.

This complex technology involved unfurling and deployment of the 3.6 m antenna which was folded and stowed during launch," ISRO said in an update.

The deployment was completed in 9 minutes and 12 seconds, it said.

On Wednesday, ISRO successfully launched RISAT-2BR1 and nine foreign satellites onboard PSLV-C48 in its 50th flight.

RISAT-2BR1 is India's radar imaging earth observation satellite which would be used in the field of agriculture, forestry and disaster management and also for military purposes.

Following the successful launch of the RISAT-2BR1- satellite, two solar arrays were deployed automatically and the ISRO Telemetry Tracking and Command Network in Bengaluru assumed control of the satellite.

In the coming days, the satellite would be brought to its final operational configuration, ISRO said.

https://economictimes.indiatimes.com/news/science/isro-scientists-unfurl-antenna-of-risat-2br1-satellite/articleshow/72495110.cms

जनसत्ता

Fri, 13 Dec 2019

इसरो ने रिसैट-2बीआर1 उपग्रह का एंटिना खोला

चेन्नई, 12 दिसंबर (भाषा)।

भारतीय अंतरिक्ष अनुसंधान संगठन (इसरो) के वैज्ञानिकों ने यहां से 130 किलोमीटर दूर स्थित श्रीहरिकोटा से उपग्रह रिसैट-2बीआर1 को प्रक्षेपित करने के एक दिन बाद गुरुवार को अंदर मौजूद एंटिना को खोलने का काम सफलतापूर्वक पूरा कर लिया।

इसरो ने ट्वीट किया, 'गुरुवार को दो बजे रिसैट-2बीआर1 उपग्रह के रेडियल रिब एंटिना (छतरी आकार के) को सफलतापूर्वक कक्षा में स्थापित कर दिया गया। यह जटिल प्रौद्योगिकी है जिसमें 3.6 मीटर व्यास के एंटिना को खोला जाता है। एंटिना प्रक्षेपण के दौरान उपग्रह के अंदर बंद रहता है।' इसरो के मुताबिक एंटिना को खोलने के मिशन को नौ मिनट 12 सेकेंड में पूरा किया गया। इसरो ने बुधवार को नौ विदेशी उपग्रह के साथ रिसैट-2बीआर1 को पीएसएलवी-सी48 रॉकेट के जरिये प्रक्षेपित किया था। पीएसएलवी का यह 50वां मिशन था। रिसैट-2बीआर1 भारत का रडार मानचित्रण आधारित भू निगरानी उपग्रह है जिसका इस्तेमाल कृषि, वन और आपदा प्रबंधन के साथ-साथ सैन्य जरूरतों के लिए भी इस्तेमाल किया जा सकता है। उपग्रह को प्रक्षेपित करने के बाद स्वतः ही दो सौर सारणी आबंटित की गई और माना जा रहा है कि बंगलुरु स्थित इसरो टेलीमेट्री ट्रैकिंग एंड कमांड नेटवर्क ने इसका नियंत्रण ले लिया। इसरो ने बताया कि आने वाले दिनों में उपग्रह को अंतिम मुकाम पर पहुंचाने का काम पूरा कर लिया जाएगा।

जनसत्ता

Fri, 13 Dec 2019

परमाणु ऊर्जा उत्पादन में इजाफे के लिए 12 नए रिएक्टरों को मंजूरी

नई दिल्ली, 12 दिसंबर (भाषा)।

सरकार ने परमाणु ऊर्जा उत्पादन में वृद्धि के लिए 12 नए रिएक्टरों के निर्माण की खातिर प्रशासनिक एवं वित्तीय मंजूरी दी है। प्रधानमंत्री कार्यालय में राज्य मंत्री जितेंद्र सिंह ने राज्यसभा में प्रश्नकाल के दौरान एक पूरक सवाल के जवाब में बताया कि वर्तमान में नौ रिएक्टर निर्माणाधीन हैं और मंजूरी प्राप्त 12 रिएक्टरों के लिए परियोजना-पूर्व गतिविधियां चल रही हैं।

मंजूरी प्राप्त 12 रिएक्टरों की क्षमता 9000 मेगावाट है। इससे देश की ऊर्जा जरूरतों की पूर्ति में मदद मिलेगी। उन्होंने बताया कि निर्माणाधीन रिएक्टर गुजरात के काकरापार, राजस्थान के माही बांसवाड़ा रावतभाटा, मध्य प्रदेश में चुटका, कर्नाटक के कैगा, तमिलनाडु के कलपक्कम और कुडनकुलम व हरियाणा के गोरखपुर में स्थित हैं।

एक अन्य सवाल के लिखित जवाब में उन्होंने राज्यसभा को बताया कि भारत की मंग्रल ग्रह पर मानवयुक्त मिशन भेजने की कोई योजना नहीं है और इसके लिए अंतरिक्ष यात्रियों को प्रशिक्षण नहीं दिया जा रहा है। उनसे प्रश्न किया गया था कि क्या मंग्रह ग्रह पर मानवयुक्त मिशन भेजने की कोई योजना है और क्या इसके लिए अंतरिक्ष यात्रियों का प्रशिक्षण शुरू किया जा चुका है? सिंह ने कहा कि ऐसी कोई योजना नहीं होने के कारण अंतरिक्ष यात्रियों के प्रशिक्षण का प्रश्न ही नहीं उठता।