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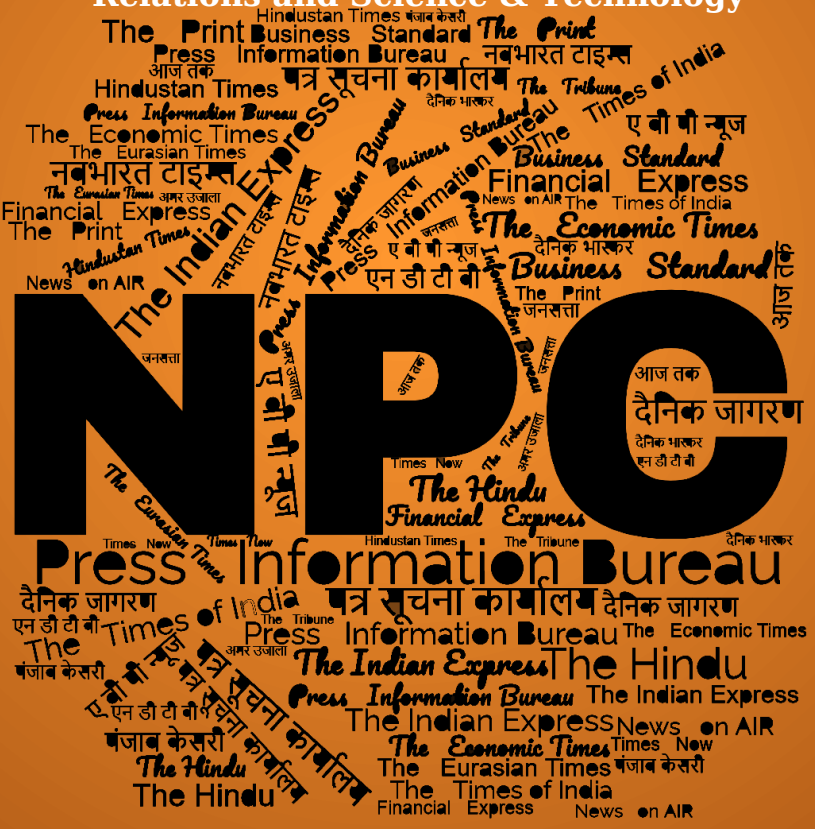
समाचार पत्रों से चयित अंश
Newspapers Clippings

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

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology



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अमर उजाला

Fri, 01 Sep 2023

अस्थायी पुलों के निर्माण के लिए स्वदेशी उत्पाद का इस्तेमाल कर रही सेना, विदेशों पर निर्भरता खत्म

रक्षा अनुसंधान व विकास संगठन (डीआरडीओ) की ओर से डिजाइन और विकसित शॉर्ट स्पैन ब्रिजिंग सिस्टम (एसएसबीएस) से सेना की विदेशों पर निर्भरता खत्म हो गई है। कुछ ही घंटों में 300 मीटर तक लंबा और चार मीटर चौड़ा पुल तैयार करने के लिए अब देश में ही सामान बनने लगा है। पहले इसके स्पेयर पार्ट्स रूस और चेकोस्लोवाकिया से आयात किए जाते थे, लेकिन अब डीआरडीओ के सहयोग से देश में ही एलएंडटी कंपनी इसका निर्माण कर रही है। खास बात यह है कि भारतीय सेना इन उत्पादों को एमएसएमई के तहत खरीदने की तैयारी कर रही है ताकि मध्यम और लघु उद्योगों की आर्थिकी भी सुदृढ़ रहे।

शॉर्ट स्पैन ब्रिजिंग सिस्टम डीआरडीओ इंजीनियरिंग लैब के रिसर्च एंड डेवलपमेंट एस्टैब्लिशमेंट विंग की ओर से तैयार किया गया है। जीरकपुर स्थित खड़का सैपर्स इंजीनियर ब्रिगेड में प्रशिक्षण के लिए सेना स्वदेशी उत्पादों का इस्तेमाल कर रही है। ब्रिगेड के कर्नल धीरज पोहड़ ने बताया कि आत्मनिर्भर भारत के तहत अब सेना कई चीजों के लिए विदेशों पर निर्भर नहीं रही है। ड्रोन से लेकर शॉट स्पैन ब्रिजिंग सिस्टम तक भारत में बनने लगे हैं। उन्होंने बताया कि देश में बने इस सिस्टम के तहत निर्मित अस्थायी पुलों से सेना के भारी भरकम टैंकर और अन्य भारी वाहक गुजारे जा सकते हैं। सेना की चंडीगढ़ सहित अन्य इंजीनियरिंग शाखाओं में ये उत्पाद पहुंचाए जाने लगे हैं।

क्या है एसएसबीएस और कैसे करता है काम

डीआरडीओ की प्रमुख इंजीनियरिंग प्रयोगशाला, अनुसंधान एवं विकास प्रतिष्ठान (इंजीनियरिंग) पुणे ने मेसर्स एलएंडटी लिमिटेड के सहयोग से इस प्रणाली को डिजाइन और विकसित किया है। इनका प्रयोग सेना युद्ध के दौरान आर्मर टैंकों समेत अन्य सैन्य वाहनों की आवाजाही के लिए करती है। साथ ही आपदाग्रस्त इलाकों में भी सेना द्वारा इस तरह के पुल बनाए जाते हैं। इस प्रणाली से सैनिकों की त्वरित आवाजाही में मदद के साथ संसाधनों की गतिशीलता बढ़ी है। डीआरडीओ के पास मिलिट्री ब्रिजिंग सिस्टम जैसे महत्वपूर्ण कॉम्बैट इंजीनियरिंग सिस्टम विकसित करने का व्यापक अनुभव है।

https://www.amarujala.com/chandigarh/short-span-bridging-system-by-defense-research-development-organization-ended-army-dependence-on-foreign-2023-08-31

Defence News

Defence Strategic: National/International

Business Standard

Thu, 31 Aug 2023

IAF to Carry out Mega Exercise from Sept 4-14 along China, Pak Borders

The Indian Air Force will conduct an 11-day mega exercise beginning September 4 along the borders with China and Pakistan and it will involve all the key frontline combat jets, attack choppers, mid-air refuellers and other critical air assets, sources in the defence and military establishment said on Thursday.

The exercise 'Trishul' is taking place amid the over three-year confrontation between Indian and Chinese troops as well as New Delhi's continuing frosty ties with Pakistan.

The aim of the exercise, being organised by the IAF's Western Command from September 4-14, is to test the combat capabilities of the force and assess various operational dimensions, they said.

It will one of the largest air exercises to be carried out by the Indian Air Force (IAF) in recent times, said one of the sources, adding that all key platforms of the Western Air Command as well as assets from other commands will be deployed for the drills.

The fighter jets to be part of the drills include Rafales, Su-30 MKIs, Jaguars, Mirage-2000s, MiG-29s and MiG-21 Bisons, the sources said about the annual wargame.

They said attack helicopters, mid-air refuellers, AWACS (Airborne Warning and Control System) aircraft and the transport fleet will also be deployed for the drills.

The exercise will largely cover frontline bases in Ladakh, Jammu and Kashmir, Rajasthan, Punjab, Himachal Pradesh and Uttarakhand, the sources said.

The result of the exercise will be thoroughly examined in the Air Headquarters at the end of the drills, they added.

Following the eastern Ladakh border row, the IAF has significantly enhanced its combat capabilities as part of a series of measures, including through procurement of new equipment and weapon systems.

https://www.business-standard.com/india-news/iaf-to-carry-out-mega-exercise-from-sept-4-14-along-china-pak-borders-123083101414_1.html

THE TIMES OF INDIA

Thu, 31 Aug 2023

IAF Erects Air Defence Shield for Delhi-NCR for G20 Summit

The IAF is going full steam ahead in making the airspace over the Delhi-National Capital Region as impregnable as possible, with fighter jets, surface-to-air missile systems, anti-drone systems, airborne early-warning and control systems (AEW&C) and other sensors being deployed for the G20 summit on September 9-10.

“The IAF’s ODC (operations direction centre), which will liaise with the JCAC (joint control and analysis centre) and other agencies involved, will have the composite air picture at one place to detect threats, ranging from small, slow-moving objects like drones to large, fast-moving aircraft,” a source said.

“If a threat is conclusively established, the ODC will decide what is the best method, or which particular weapon system should be used, to neutralize it,” he added.

While similar “air defence” arrangements are made to tackle any aerial threat from hostile aircraft, helicopters and drones during the Republic Day, Independence Day and other occasions every year, the scale of preparations for the G20 summit is “much larger and intensive”, the sources said.

Frontline fighters like the Rafales, Mirage-2000s and Sukhoi-30MKIs will patrol the skies, even as air-bases in the region like Ambala, Bareilly, Sirsa, Bhatinda, Gwalior and others will also maintain ORPs (operational readiness platforms) round-the-clock.

This involves two to three fighters being kept combat-ready in blast pens adjoining the runway at an airbase for immediate take-off whenever an alarm is sounded.

Similarly, a wide array of surface-to-air guided weapon systems have been deployed to protect the Delhi-NCR. These include MR-SAMs (medium-range surface-to-air missile systems), jointly developed with Israel, which are designed to destroy hostile aircraft, helicopters, cruise missiles and drones at a range of 70-km.

“The fully-indigenous Akash air defence missiles, which have an interception range of 25-km, are also being deployed. Netra AEW&C aircraft and other sensors, including enough low-level transportable radars, in turn, will continuously scan the airspace in and around Delhi-NCR to detect any inimical movement in the skies,” the source said.

https://timesofindia.indiatimes.com/india/iaf-erects-air-defence-shield-for-delhi-ncr-for-g20-summit/articleshow/103257376.cms

JANES

Thu, 31 Aug 2023

India Orders Spike ATGMs

The Indian Ministry of Defence (MoD) has signed a contract worth INR2.87 billion (USD34.7 million) with Kalyani Rafael Advanced Systems Pvt Ltd (KRAS) to deliver an unknown number of Spike anti-tank guided missiles (ATGMs) to the Indian Armed Forces, Rudra B Jadeja, managing director and CEO of KRAS, told Janes on 31 August.

According to a press statement by KRAS on 28 August, the order is expected to be “executed over the next 12 months”.

KRAS is a joint venture (JV) company between Kalyani Strategic Systems Ltd (KSSL) – defence subsidiary of Bharat Forge Ltd – and Israel's Rafael Advanced Defense Systems (Rafael) Ltd. KSSL owns 51% of the group and the latter 49%. Jadeja did not specify the version of Spike ATGMs that would be delivered to the Indian Armed Forces, but Janes assesses it to be Spike SR ATGMs. KRAS commissioned a INR700 million Spike SR ATGM production facility in Hyderabad in July 2018.

Talking to the media, Kalyani Group chairman Baba Kalyani said at the time of commissioning that the JV was ready to supply the Spike missile to the Indian Armed Forces, and 90% of its components would be sourced locally.

“The Spike missile is a fully built ATGM unit, except for the explosives and the propellants,” Kalyani said.

According to Janes Weapons: Ammunition, the Spike series is a family of anti-tank guided weapon (ATGW) systems originally developed in Israel. These range from the short-range, disposable Spike SR to the long-range Spike ER. Some versions of the Spike family are capable of non-line-of-sight (NLOS) engagements.

https://www.janes.com/defence-news/news-detail/india-orders-spike-atgms

Hindustan Times

Fri, 01 Sep 2023

China, Ukraine, Defence on PM-Biden Bilateral Agenda

US President Joe Biden and Prime Minister Narendra Modi will have a “rich and multifaceted” discussion that will take stock of the progress in India-United States relationship since Modi’s historic state visit to Washington DC, the progress in the defence and economic arena, the Chandrayaan mission, India’s and America’s diplomatic engagements with China, the US’s trilateral summit with Japan and South Korea held recently, developments in the Indo-Pacific, and the war in Ukraine, a senior US administration official has said.

The two countries are also discussing ways to overcome differences on civil nuclear issues where India’s nuclear liability law remains a concern for American nuclear industry. While a deal is not yet done, there has been “clear progress” on the issue, the official indicated.

“The truth is that the two leaders have established an ambitious bilateral agenda for the two countries and an agenda that integrates the US and India into a larger framework of nations including the Quad. But it’s also fair to say that the two leaders have been close. My expectation is that we will we have a strong official visit, have a number of deliverables and follow-on work from the last summit and the other work that we have done since”, the official said. “Close personal ties” between the two leaders developed over time have enabled ambitious steps in recent months, demonstrated by the “care and attention” Biden gave to the Indian PM in June.

The two sides will also discuss a second visit by Biden early next year to India. The India-US corridor has been abuzz with speculation that the US President may be the chief guest at the Republic Day ceremony and attend the Quad leaders’ summit to be held in India in 2024.

Biden is travelling to India from September 7 to 10, before heading to Vietnam.

When asked about the bilateral leg of the September visit on the sidelines of the G20 summit, the official, alluding to Modi's state visit, said that in the period after ambitious visits, there is often a tendency to get distracted and turn away from areas of hard work. "We can't let that happen in the US-India relationship. We need to continue to follow on intensively. Much has happened since the visit, the absolutely historic moon landing of the Indian system. The steps in terms of investments from American firms in India, a number of things that we are working on in the Indo-Pacific Economic Framework. I think it would be fair to say that we are pressing forward across a broad range of areas and I think as much as anything else, the president and the PM will take stock where we are, what progress we have made, and perhaps they will identify areas that need greater focus."

The US administration believes that there has been "substantial progress" in the defence arena and both sides will explore whether there are other steps to be taken

The leaders will also discuss China. The official said, "We obviously watched closely over the course of the last couple of months the intense diplomacy that's taken place on between India and China around the Line of Actual Control. I think the President is going to want to be updated and briefed from PM Modi about how India's side thinks those discussions have taken place, how they have gone." The US, too, has stepped up its engagement with China, with four senior administration figures visiting Beijing in recent months and the American approach, which the official said was coming from a "position of strength", is also likely to figure in the discussions.

The recent trilateral summit between US, Japan and South Korea, hosted by Biden at Camp David, will also figure in the talks. "He will want to update the PM on those developments. Modi is always interested in developments in the Indo-Pacific and also they will talk about their shared goals and objectives in the Pacific given that India is also stepping up its engagements in critical countries in the South Pacific," the official said. They will also discuss the war in Ukraine and share updates about how both sides see the war shaping up.

Asked if there had been discussions on civil-nuclear issues, the official acknowledged that both countries were in the final stage of talks, there had been progress, and the hope was that they will make some advance in areas where there wasn't as much progress last time. "We are looking very closely at the civil nuclear issue."

"It's a very rich agenda. It's multifaceted. It basically spans every element of our bilateral relationship and I think we want to use this opportunity to both take stock and serve as a catalyst for further progress," the official added.

https://www.hindustantimes.com/india-news/china-ukraine-defence-on-pm-biden-bilateral-agenda-101693506715583.html

Business Standard

Thu, 31 Aug 2023

Brazil's Embraer in Talks with HAL, Tata for Defence Aircraft Manufacturing

Aerospace firm Embraer SA is holding discussions with five Indian firms, including Hindustan Aeronautics Ltd (HAL) and Tata Group, to make defence transport aircraft in India, according to a report by Mint. The firm expects to finalise and announce its partner by the end of this year.

Joao Bosco da Costa Junior, president and chief executive of Embraer Defence & Security, stated in an interview that the firm is watching what the big players are doing in India and learning from

them. The firm is talking to four or five companies to discuss the Medium Transport Aircraft (MTA) programme, and these companies are from both the government and private sectors.

Regarding whether Embraer is in talks with HAL or Tata group, Costa Junior said," I think you are touching some big players... and we are learning from them, and we are in touch with them as well."

He added that the firm expects to announce its partner by December. He also stated that the potential partnership could also make commercial aircraft.

Costa Junior stated that Embraer is currently visiting the facilities of these firms and evaluating the best match to add value under the make-in-India initiative.

The firm is open to any agreement to help it grow in the Indian market. Costa Junior also said that Embraer is not here to offer just final assembly or parts manufacturing, the company sees India as a hub and, if needed, will share intellectual properties with the Indian government.

Earlier this year, the Indian Air Force (IAF) had issued a Request for Information for a new fleet of 40-80 Medium Transport Aircraft, for which Embraer is offering its C-390 Millennium aircraft. US' Lockheed Martin Corp with its C-130J Super Hercules and Europe's Airbus Defence and Space with its A400M aircraft are Embraer's likely rivals.

Embraer said the company would like to have a strong brand positioning in India irrespective of whether it wins the order. "I would like to have Embraer Defence & Security as a strong brand here in the country. So, of course, I'm looking forward to having a big operation here if I win the MTA (order), but I would like to keep my journey here forever," Costa Junior said in the interview.

Currently, Embraer has around 40 aircraft in India, operating in defence, executive, and commercial aviation.

https://www.business-standard.com/economy/news/brazil-s-embraer-in-talks-with-hal-tata-for-defence-aircraft-manufacturing-123083100401_1.html

ARMY TECHNOLOGY

Thu, 31 Aug 2023

Pakistan Defence Budget to Reach $10bn by 2028, Forecasts GlobalData

Although contending with worsening economic headwinds, Pakistan has maintained defence spending in 2023 as it bids to boost its military capabilities amid historic and ongoing tensions with regional rivals, with a focus on fixed-wing aerospace modernisation.

According to GlobalData's latest report, "Pakistan's Defense Market Size and Trends, Budget Allocation, Regulations, Key Acquisitions, Competitive Landscape and Forecast, 2023-28," Pakistan's defence budget witnessed a sharp decline of 14% annual growth rate in 2022.

However, it grew from $7.8bn in 2022 to $8.3bn in 2023, enabling it to maintain a positive compound annual growth rate (CAGR) of 0.5% over the period 2019-23.

Pakistan's efforts to secure its borders and maintain stability within the country have been the primary factors shaping its defence investments over the years, according to GlobalData analysis. Historically, challenges including Pakistan's volatile relationship with its neighbours and regional separatist movements, have played a major role in influencing the country's defense policy making.

These factors are expected to continue to drive Pakistan's defense budget to an estimated $10bn by 2028.

Akash Pratim Debbarma, aerospace and defence Analyst at GlobalData, commented: "Despite facing a severe economic crisis, Pakistan did not cutback its defence budget in 2023, which indicates the country's emphasis on strengthening its defence capabilities and signifies its desire to ensure stability and security within its borders and fostering tranquility in the region.

"The projected growth in the defence budget showcases its intent to responsibly allocate resources to meet the needs of its armed forces."

As Pakistan charts its path towards modernisation, a significant emphasis lies on bolstering its military fixed-wing aircraft capabilities. According to GlobalData estimates, the country is expected to cumulatively allocate $3.6bn between 2023 and 2033 for procuring various categories of military fixed-wing aircraft.

The ongoing and planned procurement programmes, such as the acquisition of FC-31, J-10C, PAC PF-X, and JF-17 Block-3 multi-role aircraft, are set to play a pivotal role in shaping the future of Pakistan's aerial prowess, GlobalData added.

Debbarma concluded: "Through a strategic partnership with China, Pakistan was able to source advanced weaponry and technologies while nurturing its indigenous defence manufacturing capabilities. Despite its challenges, the country is trying to mix external collaboration and internal innovation to develop a robust domestic defense industry landscape. Pakistan is also organising events like IDEAS 2024, slated to be held in Karachi in 2024, to promote local defence companies and provide opportunities to showcase their defence products to the international markets."

Pakistan's defence budget balancing act

According to GlobalData's analysis of Pakistan's equipment inventory, the failure of the peace process with India has compelled the country to maintain a robust defence posture and increase defence spending.

Key areas of military procurement include combat aircraft, missile systems, submarines, and naval vessels. The majority of Pakistan's defence budget is allocated to the services, with a small amount for defence administration.

The historic period witnessed a decline in the budget from $8.2bn in 2019 to $7.8bn in 2022 which increased again in 2023 to reach $8.3bn.

https://www.army-technology.com/news/pakistan-defence-budget-to-reach-10bn-by-2028-forecasts-globaldata

ANI
South Asia's Leading Multimedia News Agency

Fri, 01 Sep 2023

Japan's Defence Ministry Seeks Record 7.7 Trillion Yen Budget for FY 2024

Japan's Defence Ministry on Thursday requested a record 7.7 trillion yen (USD 53 billion) budget for fiscal year 2024 as the government aims to deploy arms to realize newly authorized capabilities to strike enemy targets for stronger deterrence in the wake of the worsening regional security environment, Kyodo News reported.

Kyodo News is a non-profit cooperative news agency based in Minato, Tokyo.

The budget exceeds the 6.8 trillion yen initial budget for the current fiscal 2023 that started in April after Japanese Prime Minister Fumio Kishida updated a key security document late last year and pledged to boost defence spending.

The requested amount does not include costs linked to hosting US military bases, which have been about 200 billion yen annually. The initial defence budget, expected to be fixed by the year-end, will likely rise for the 12th straight year.

As per Kyodo News, among the planned outlays, 755.1 billion yen will be allocated for enhancing its "standoff" defence capacity, the main pillar of so-called counterstrike capabilities, by developing and procuring missiles capable of being launched from beyond the range of enemy fire.

The government through the National Security Strategy, vowed to obtain counterstrike capabilities and almost double its annual defense expenditure over five years through fiscal 2027.

Facing security challenges posed by China, North Korea and Russia, the move by the Kishida administration was a significant shift from Japan's exclusively defence-oriented policy under its war-renouncing Constitution, according to Kyodo News.

To make better preparations for a contingency near the country's remote southwestern islands, 595.1 billion yen will be appropriated for improving capabilities to swiftly deploy personnel and transport equipment, such as purchasing transport helicopters.

https://www.aninews.in/news/world/asia/japans-defence-ministry-seeks-record-77-trillion-yen-budget-for-fy-202420230901095601/

The EurAsian Times

Fri, 01 Sep 2023

Chinese Scientists Develop ‘Small Ripple’ Detector that could Make BIG WAVES in Submarine Hunting!’

Chinese scientists have reportedly developed a terahertz-based submarine detection device that detects tiny vibrations or ripples on the water surface caused by a submarine under the ocean.

The terahertz frequency range has been assessed to be more suitable for next-generation 6G technology, which promises exceptionally high-speed data rates and communications.

Interestingly, in the middle of this month, another group of scientists made a complementing discovery in a different aspect of the same principle – detecting submarines through the ‘cavitation bubbles.’

The bubbles are produced due to the vessel and propeller’s underwater movements. After being formed, the bubbles ‘pops’ have faint signals that exit the water surface and enter the atmosphere, which Chinese scientists said could be detected.

While it is unclear if the two experiments are coordinated, they have addressed different aspects of the same underwater hydrodynamic phenomena.

Given the highly integrated nature of China’s political system, its military, affiliated scientific research institutes, and its civilian academia, it can be assumed that the research teams must have followed each other’s work through the papers published in various peer-reviewed journals.

Small Wave Detector

According to a South China Morning Post report, a National University of Defense Technology (NUDT) team tested the device that generates terahertz emissions/waves. These detected surface vibrations/ripples as small as 10 nanometers tall.

This small dimension is "well below the detection range of existing technology." Their work was published on August 11 in the Journal of Radars, a Chinese-language peer-reviewed journal.

"A small unmanned aerial vehicle (UAV) platform has the advantage of good mobility, low cost, and flexible deployment" and could work together with other submarine detection methods such as a magnetic anomaly detector (MAD), microwave radar, or laser.

"As a supplement to existing detection methods, it can provide important information for the detection and identification of submarines," the NDUT team added.

"The experiment was conducted at an unspecified location in the northeastern city of Dalian in the Yellow Sea. The weather was fair at the time of the test, but breaking waves produced lots of bubbles.

"The military scientists used an artificial sound source to simulate the noise emitted by a submarine. To replicate drone flight, the submarine detector was carried by an extended arm of a research ship," the SCMP report adds.

Two Teams, Same Phenomena, Different Approaches

Like the Chinese Academy of Sciences (CAS) researchers, the NUDT team also found a similar problem with the surface disturbance caused by the underwater movement of a submarine. "The disturbance is feeble by the time it reaches the surface. Separating it from the natural waves of the ocean was previously thought impossible."

However, the new device has hardware and software to address the issue. While the terahertz waves made the sensor extremely sensitive to even small surface water ripples, it was aided by a one-of-a-kind algorithm to "effectively identify nanometer-sized ripples over the wobbling ocean."

In the test, the terahertz sensor picked up man-made ripples with amplitude ranging from 10 to 100 nanometers, depending on the sea conditions. The technology could also be used for "cross-medium" communication between a submarine and overhead-friendly aircraft, which has been challenging even for advanced navies like the US.

'Practical Application Remains to be Seen'

According to retired DRDO scientist Dr. Ravi Kumar Gupta, the technology is theoretically credible and promising but still at a preliminary level. "It practically needs to be seen, especially when scaling up production during mass manufacture. Advanced machines need specialized electrical and electronic components, which private companies do not commonly manufacture," Dr. Gupta said.

"Terahertz wavelengths are between the infrared and microwave spectrums, and systems operating on this foundation need an entirely different set of sensors and electrical circuitry," he told EurAsian Times.

He added that another thing is getting companies to design such components and sub-components as per specifications and then promising them bulk orders, guaranteeing profits and economies of scale.

Private firms usually do not invest in factory lines of specialized devices against piecemeal orders. "It sometimes takes months and even several years coordinating with vendors to get the supply chain and manufacturing ecosystem right," Gupta added.

Second Such Discovery

In the last such breakthrough in submarine detection through underwater vibrations, scientists from the Chinese Academy of Sciences' Fujian Institute of Research on the Structure of Matter discovered that bubbles produced by 'cavitation' – a result of a submarine passing through water and the propeller churning – also generate a shallow frequency (ELF) signal.

According to an SCMP report, this 'magnetohydrodynamic' (MHD) effect causes the ELF signals to penetrate water, reach the ionosphere, and reflect to the earth's surface. However, experts pointed out even then that the MHD signals could be affected by many other variables like naturally occurring electromagnetic noise, human-made signals, or even when a submarine slows down or stops.

The development also follows previous reports of China's success in 6G communication. Tianjin University's School of Precision Instruments and Optoelectronics Engineering invented a laser system that can emit a continuous beam of electromagnetic waves in the terahertz spectrum, which is needed for 6G next-communication technology.

This was preceded by the breakthrough in 6G technology in January 2022, where researchers achieved a record transmission speed of 206.25 gigabits per second.

https://www.eurasiantimes.com/edited-nc-checked-chinese-scientists-develop-small-ripple/

DECCAN HERALD

Thu, 31 Aug 2023

US Plans to Use Autonomous War Robots to Counter China's Growing Power

The United States military plans to start using thousands of autonomous weapons systems in the next two years in a bid to counter China's growing power, US Deputy Secretary of Defense Kathleen Hicks announced in a speech on Monday.

The so-called Replicator initiative aims to work with defence and other tech companies to produce high volumes of affordable systems for all branches of the military.

Military systems capable of various degrees of independent operation have become increasingly common over the past decade or so. But the scale and scope of the US announcement makes clear the future of conflict has changed: the age of warfighting robots is upon us.

An idea whose time has come

Over the past decade, there has been considerable development of advanced robotic systems for military purposes. Many of these have been based on modifying commercial technology, which itself has become more capable, cheaper and more widely available.

More recently, the focus has shifted onto experimenting with how to best use these in combat. Russia's war in Ukraine has demonstrated that the technology is ready for real-world deployment.

Loitering munitions, a form of robot air vehicle, have been widely used to find and attack armoured vehicles and artillery. Ukrainian naval attack drones have paralysed Russia's Black Sea fleet, forcing their crewed warships to stay in port.

Military robots are an idea whose time has come.

Robots everywhere.

In her speech, Hicks talked of a perceived urgent need to change how wars are fought. She declared, in somewhat impenetrable Pentagon-speak, that the new Replicator programme would field attritable autonomous systems at scale of multiple thousands, in multiple domains, within the next 18 to 24 months.

Decoding this, 'autonomous' means a robot that can carry out complex military missions without human intervention.

'Attritable' means the robot is cheap enough that it can be placed at risk and lost if the mission is of high priority. Such a robot is not quite designed to be disposable, but it would be reasonably affordable so many can be bought and combat losses replaced.

Finally, 'multiple domains' means robots on land, at sea, in the air and in space. In short, robots everywhere for all kinds of tasks.

The robot mission

For the US military, Russia is an 'acute threat' but China is the 'pacing challenge' against which to benchmark its military capabilities.

China’s People’s Liberation Army is seen as having a significant advantage in terms of 'mass', it has more people, more tanks, more ships, more missiles and so on. The US may have better-quality equipment, but China wins on quantity.

By quickly building thousands of 'attritable autonomous systems', the Replicator program will now give the US the numbers considered necessary to win future major wars.

The imagined future war of most concern is a hypothetical battle for Taiwan, which some postulate could soon begin. Recent tabletop wargames have suggested large swarms of robots could be the decisive element for the US in defeating any major Chinese invasion.

However, Replicator is also looking further ahead, and aims to institutionalise mass production of robots for the long term. Hicks argues: "We must ensure (China’s) leadership wakes up every day, considers the risks of aggression, and concludes, “today is not the day and not just today, but every day, between now and 2027, now and 2035, now and 2049, and beyond".

A brave new world?

One great concern about autonomous systems is whether their use can conform to the laws of armed conflict.

Optimists argue robots can be carefully programmed to follow rules, and in the heat and confusion of combat they may even obey better than humans.

Pessimists counter by noting not all situations can be foreseen, and robots may well misunderstand and attack when they should not. They have a point.

Among earlier autonomous military systems, the Phalanx close-in point defence gun and the Patriot surface-to-air missile have both misperformed.

Used only once in combat, during the first Gulf War in 1991, the Phalanx fired at a chaff decoy cloud rather than countering the attacking anti-ship missile. The more modern Patriot has proven effective in shooting down attacking ballistic missiles, but also twice shot down friendly aircraft during the second Gulf War in 2003, killing their human crews.

Clever design may overcome such problems in future autonomous systems. However, Hicks promised a “responsible and ethical approach to AI and autonomous systems” in her speech –

which suggests any system able to kill targets will still need formal authorisation from a human to do so.

A global change

The US may be the first nation to field large numbers of autonomous systems, but other countries will be close behind. China is an obvious candidate, with great strength in both artificial intelligence and combat drone production.

However, because much of the technology behind autonomous military drones has been developed for civilian purposes, it is widely available and relatively cheap. Autonomous military systems are not just for the great powers, but could also soon be fielded by many middle and smaller powers.

Libya and Israel, among others, have reportedly deployed autonomous weapons, and Turkish-made drones have proved important in the Ukraine war.

Australia is another country keenly interested in the possibilities of autonomous weapons. The Australian Defence Force is today building the MQ-28 Ghostbat autonomous fast jet air vehicle, robot mechanised armoured vehicles, robot logistic trucks and robot submarines, and is already using the Bluebottle robot sailboat for maritime border surveillance in the Timor Sea.

And in a move that foreshadowed the Replicator initiative, the Australian government last month called for local companies to suggest how they might build very large numbers of military aerial drones in-country in the next few years.

At least one Australian company, SYPAQ, is already on the move, sending a number of its cheap, cardboard-bodied drones to bolster Ukraine's defences.

https://www.deccanherald.com/world/us-plans-to-use-autonomous-war-robots-to-counter-chinas-growing-power-2667501

R. REPUBLICWORLD.COM

Thu, 31 Aug 2023

US, Indonesia Hold War Drills with 5 Other Nations Amid Concerns over Chinese Aggression

Soldiers from the US, Indonesia and five other nations began annual training exercises Thursday on Indonesia's main island of Java while China's increasing aggression is raising concern.

American and Indonesian soldiers have held the live-fire drill since 2009, and Australia, Japan and Singapore joined last year. The United Kingdom and French forces are participating in this year's Super Garuda Shield exercises, with a total of about 5,000 personnel.

China sees the expanded drills as a threat, accusing the US of building an Indo-Pacific alliance similar to NATO to limit China's growing military and diplomatic influence in the region.

Brunei, Brazil, Canada, Germany, India, Malaysia, Netherlands, New Zealand, Papua New Guinea, Philippines, South Korea, and East Timor also sent observers to the two-week exercises in Baluran, a coastal town in East Java province.

Commanding general of US Army Pacific, Gen. Charles Flynn, said the 19 nations involved in the training are a powerful demonstration of multilateral solidarity to safeguard a free and open Indo-Pacific region.

“Super Garuda Shield 2023 builds on last year's tremendous success,” Flynn said in a statement released by the U.S. Embassy in Jakarta on Tuesday, “This joint, multinational training exercise displays our collective commitment and like-minded unity, allowing for a stable, secure, and more peaceful, free and open Indo-Pacific.” The statement said at least 2,100 U.S. and 1,900 Indonesian forces will enhance interoperability capabilities through training and cultural exchanges that includes a command and control simulation, an amphibious exercise, airborne operations, an airfield seizure exercise, and a combined joint field training that culminates with a live-fire event.

The command post exercise will focus on mission planning staff tasks in a combined military setting. A field training exercise will involve battalion-strength elements from each nation exercising war-fighting skills to enhance interoperability and combined operational capacity.

Garuda Shield was held in several places, including in waters around Natuna at the southern portion of the South China Sea, a fault line in the rivalry between the U.S. and China.

Indonesia and China enjoy generally positive ties, but Jakarta has expressed concern about what it sees as Chinese encroachment in its exclusive economic zone in the South China Sea.

The edge of the exclusive economic zone overlaps with Beijing's unilaterally declared “nine-dash line” demarking its claims in the South China Sea.

Increased activities by Chinese coast guard vessels and fishing boats in the area have unnerved Jakarta, prompting Indonesia's navy to conduct a large drill in July 2020 in waters around Natuna.

https://www.republicworld.com/world-news/rest-of-the-world-news/us-indonesia-hold-war-drills-with-5-other-nations-amid-concerns-over-chinese-aggression-articleshow.html

Science & Technology News

Hindustan Times

Fri, 01 Sep 2023

Aditya L1 Solar Mission: Countdown Begins Today; ISRO Chief Says ‘Rocket, Satellite Ready' for Launch

The Indian Space Research Organisation, hot on the heels of its lunar landing success, is set to blast a probe even deeper into space to study the sun. Slated for launch on September 2, the Aditya-L1 (Aditya is a name for the sun in the Hindi language) is the first Indian space mission to study the sun.

On Thursday, ISRO chairman S Somanath said the space agency was getting ready for the launch and that the countdown for its launch will start on Friday.

India's first solar mission is scheduled to be launched on September 2 at 11.50am from the Sriharikota spaceport in Andhra Pradesh.

Aditya-L1 mission purpose

Aditya-L1 spacecraft is designed to provide remote observations of the solar corona and in situ observations of the solar wind at L1 (Sun-Earth Lagrangian point), which is about 1.5 million

kilometres from the Earth. Notably, Aditya-L1 is a fully indigenous effort with the participation of national institutions.

It will be the first dedicated Indian space mission for observations of the Sun to be launched by the Bengaluru-headquartered space agency.

"We are just getting ready for the launch. The rocket and satellite are ready. We completed the rehearsal for the launch. So tomorrow, we have to start the countdown for the day after tomorrow's launch," Somanath told reporters.

Aditya-L1's parking

Aditya-L1 will be placed in an orbit around the L1 of the Sun-Earth system, where the gravitational effects of both bodies cancel each other out. That “parking lot” in space allows objects to stay put because of balancing gravitational forces, reducing fuel consumption by the spacecraft.

Cost of Aditya-L1 mission

In 2019, the Centre sanctioned the equivalent of about $46 million for the Aditya-L1 mission. The ISRO has not given an official update on costs.

Why is the Aditya-L1 mission significant for India?

For the ISRO, success would be another major feat after India became the first country to land a spacecraft close to the lunar south pole in August.

If all goes according to plan, Aditya-L1 will enter into a halo orbit around one of five Lagrange points. From there, Aditya-L1 should enjoy an uninterrupted view of the sun and study in real-time its effect on environmental conditions in the vicinity of Earth and other planets.

The ISRO’s spacecraft can also help scientists dig out the hidden history of the Earth’s climate as solar activities have an impact on the planet’s atmosphere.

Solar missions by other countries

India will be one of a small group of countries which are studying the sun.

China has two such spacecraft orbiting Earth, including the Advanced Space-based Solar Observatory launched last year to investigate solar flares and coronal mass ejections.

Hinode, backed by space agencies from Japan, the UK, the US and Europe, is orbiting Earth and measures the magnetic fields of the sun.

The Solar & Heliospheric Observatory mission (SOHO), a joint project of NASA and the European Space Agency, is near the same Lagrange point as the one ISRO is targeting for Aditya-L1. Another joint US-European mission, Solar Orbiter, can travel as close as about 42 million km from the sun.

The US has other solar missions, including the Parker Solar Probe, which in 2021 became the first spacecraft to pass through the sun’s corona, or upper atmosphere.

What are Lagrangian points?

Lagrangian points are where gravitational forces, acting between two objects, balance each other in such a way that the spacecraft can ‘hover’ for a longer period of time.

The L1 point is considered the most significant of the Lagrangian points, for solar observations, which mathematician Joseph Louis Lagrange discovered.

https://www.hindustantimes.com/india-news/aditya-l1-mission-countdown-begins-today-isro-chief-says-rocket-satellite-are-ready-for-launch-101693530561323.html

Hindustan Times

Thu, 31 Aug 2023

ISRO Says Pragyan Rover Confirmed Presence of Sulphur. Why is it so Significant?

The Indian Space Research Organisation (ISRO) said the Pragyan rover's Laser-Induced Breakdown Spectroscope confirmed the presence of sulphur in the lunar surface near the south pole, through the first-ever in-sity measurements.

ISRO said the rover's spectroscope also detected Aluminium, Calcium, Ferrous (Iron), Chromium, Titanium, Manganese, Silicon and Oxygen as expected. The search for hydrogen is underway.

“Preliminary analyses, graphically represented, have unveiled the presence of Aluminum (Al), Sulphur (S), Calcium (Ca), Iron (Fe), Chromium (Cr), and Titanium (Ti) on the lunar surface. Further measurements have revealed the presence of manganese (Mn), silicon (Si), and oxygen (O). Thorough investigation regarding the presence of Hydrogen is underway”, ISRO said in its statement.

“LIBS instrument is developed at the Laboratory for Electro-Optics Systems (LEOS)/ISRO, Bengaluru”, ISRO added.

What is LIBS?

The Laser-Induced Breakdown Spectroscope has been developed at ISRO's Laboratory for Electro-Optics Systems (LEOS) in Bengaluru. This payload made it possible for the scientists to measure sulphur on lunar site.

According to ISRO, this method can provide elemental composition of samples, regardless of their physical state. For LIBS technology, laser is a fundamental tool, which produces induced plasma from which information on the material composition through its atomic emission spectrum is obtained. Here, remote or close-range analysis is possible by this technique since the focused laser spot can be directed to a target at a considerable distance from the rover to produce the excited plasma.

Why is the presence of sulphur on moon so significant?

According to reports, the presence of sulphur on the moon is crucial for future lunar missions. Since sulphur originates from volcanic activities, its presence can tell us a lot about the moon's history and constituents.

As mentioned earlier, the Pragyan rover is continuously searching for hydrogen on the lunar surface.

Pragyan rover encountered a crater. What happened next?

The developments come after the Indian space agency said the Pragyan rover was “on way to uncover more secrets” of the moon. The rover was ramped out of the ‘Vikram' lander hours after the Chandrayaan 3's successful landing on the moon's south pole on August 23.

On August 26, ISRO had released a video of the rover roaming around the ‘Shiv Shakti’ Point, the landing point of the Chandrayaan 3. ““Chandrayaan-3 Mission: What's new here? Pragyan rover roams around Shiv Shakti Point in pursuit of lunar secrets at the South Pole ”! ISRO had posted on X.

Yesterday, the space agency said that the Pragyan rover came across a four-metre diameter crater positioned 3 meters ahead of its location on the lunar surface yesterday.

“On August 27, 2023, the Rover came across a 4-meter diameter crater positioned 3 meters ahead of its location. The Rover was commanded to retrace the path. It's now safely heading on a new path”, ISRO had said.

India achieved history on August 23 by becoming the first country to touch down on the moon's South Pole.

https://www.hindustantimes.com/india-news/chandrayaan-3-isro-says-pragyan-rover-detected-oxygen-other-elements-on-moon-hunt-for-hydrogen-underway-101693319179939.html

Hindustan Times

Thu, 31 Aug 2023

Quake on Moon? Chandrayaan 3's Seismic Probe Detects 'Natural' Movement

Chandrayaan 3 latest updates: Indian Space Research Organisation (ISRO) on Thursday announced the findings of another in-situ scientific experiment conducted by the Chandrayaan 3 moon mission where the Lunar Seismic Activity (ILSA) payload recorded an event, “appearing to be a natural one”. The Indian space agency added that the source of this event is under investigation.

"Chandrayaan-3 Mission: In-situ Scientific Experiments - Instrument for the Lunar Seismic Activity (ILSA) payload on Chandrayaan 3 Lander - the first Micro Electro Mechanical Systems (MEMS) technology-based instrument on the moon - has recorded the movements of Rover and other payloads. Additionally, it has recorded an event, appearing to be a natural one, on August 26, 2023. The source of this event is under investigation," ISRO said in an X post.

What is the Instrument for the Lunar Seismic Activity?

Vikram Lander's ILSA comprises a cluster of six high-sensitivity accelerometers, which are indigenously fabricated using the Silicon Micromachining process. The core sensing element consists of a spring-mass system with comb-structured electrodes. External vibrations lead to a deflection of the spring, resulting in a change in capacitance which is converted into voltage.

What are the objectives of Vikram Lander's Instrument for the Lunar Seismic Activity?

ILSA's primary objective is to measure ground vibrations generated by natural quakes, impacts, and artificial events during the Chandrayaan 3 mission. The vibrations recorded during the rover's navigation on August 25, are depicted in the figure posted by ISRO on social media platform X. Additionally, an event, seemingly natural, recorded on August 26, is also shown. The source of this event is currently under investigation, the Indian space agency said.

Chandrayaan 3 mission has completed half of the expected life as lunar night will come by next week when the temperature could decrease as low as -200 degrees Celsius. Vikram Lander and Pragyan Rover are not designed to survive such chilling cold.

https://www.hindustantimes.com/india-news/quake-on-moon-chandrayaan-3s-seismic-probe-detects-natural-movement-101693487957433.html

THE TIMES OF INDIA

Fri, 01 Sep 2023

India's First Indigenous 700 MWe N-Plant Starts Working at Full Capacity in Gujarat; PM Calls it 'Milestone'

In a milestone for India’s nuclear power production, the first indigenously-developed 700 MWe nuclear power reactor at the Kakrapar Atomic Power Project (KAPP) in Gujarat has started operations at full capacity.

Hailing the Kakrapar project, PM Narendra Modi through the social media platform X, said, “India achieves another milestone. The largest indigenous 700 MWe Kakrapar Nuclear Power Plant Unit-3 in Gujarat starts operations at full capacity. Congratulations to our scientists and engineers.”

The reactor at the Kakrapar Atomic Power Project (KAPP) had started commercial operations on June 30 but had been operating at 90% of its capacity till now.

Union home minister Amit Shah also congratulated the scientists and engineers involved in the project. “India’s power acquires a new dimension today as our largest indigenous 700 MWe Kakrapar nuclear power plant unit-3 in Gujarat starts operations at full capacity. It is a firm step towards attaining PM @narendramodi Ji's vision of self-sufficiency in power production...,” Shah wrote on X.

Public sector undertaking Nuclear Power Corporation of India Limited (NPCIL) is building two 700 MW pressurised heavy water reactors (PHWRs) at Kakrapar, which is also home to two 220 MW power plants. Various commissioning activities were under way at KAPP 4, which had achieved 97.56% progress by July, according to officials.

NPCIL plans to build 16 700 MW PHWRs across the country and has granted financial and administrative sanctions for the same.

Construction of 700 MW nuclear power plants is going on at Rawatbhata, Rajasthan (RAPS 7 and 8), and at Gorakhpur in Haryana (GHAVP 1 and 2). The government has sanctioned the building of 10 indigenously developed PHWRs in fleet mode at four locations — Gorakhpur in Haryana, Chutka in MP, Mahi Banswara in Rajasthan and Kaiga in Karnataka.

India now has 23 nuclear reactors in operation in eight nuclear power plants, with a total installed capacity of 7,480 MW. Twelver more reactors are under construction at various stages, connected to the grid, totalling to 9,400 MW.

https://timesofindia.indiatimes.com/india/indias-first-indigenous-700-mwe-n-plant-starts-working-at-full-capacity-in-gujarat-pm-calls-it-milestone/articleshow/103258805.cms