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Thu, 05 May 2022

DRDO Daksh: करनाल में जिस रोबोट ने बम खोजा... जानिए उस शानदार ROV के बारे में

हरियाणा के करनाल में जिस रोबोट ने बम डिफ्यूज करने और उसे खोजने में मदद की है, उसे भारतीय रक्षा अनुसंधान एवं विकास संगठन (DRDO) ने बनाया है. दुनियाभर में आतंकी गतिविधियां करने वाले समूह अक्सर बम प्लांट करते हैं. बम निरोधक दस्ते उसे निष्क्रिय करते हैं. लेकिन कई बार ये बम फटने से दस्ते के जवान घायल हो जाते हैं या फिर मारे जाते हैं. इससे बचने के लिए दुनियाभर के देशों में रोबोट्स बनाए गए हैं. ऐसा ही एक रोबोट है डीआरडीओ का दक्ष (Daksh).

दक्ष (Daksh) बिजली से चलने वाला और दूर से नियंत्रित किया जाने वाला रोबोट है. इसे रिमोटली ऑपरेटेड व्हीकल (ROV) कहते हैं. इसे रिमोट के जरिए दूर से ऑपरेट किया जाता है ताकि जान-माल का नुकसान कम हो. इसका मुख्य काम है IED, RDX, C4 जैसे खतरनाक पदार्थों से बने बमों को खोजना. उन्हें निष्क्रिय करना. यह बमों को सुरक्षित दूरी से खोजता है. नष्ट करता है. इसमें एक बंदूक भी लगी होती है, जो फायरिंग कर सकती है. यह दरवाजों को तोड़ सकता है. अपने खांचेदार पहियों की मदद से सीढ़ियां चढ़ सकता है. इसमें लगा स्कैनर, विस्फोटक की जांच करने के लिए गाड़ियों की कर सकता है. रोबोट क्या देख रहा है, उसका सीधा फीड उसे चला रहे इंसान के रिमोट स्क्रीन पर दिखता है. इसे 500 मीटर की दूरी से ऑपरेट किया जा सकता है. इस रोबोट का 90 फीसदी हिस्सा स्वदेशी है.

यह एक बार रीचार्ज होने पर करीब 3 घंटे तक काम करता है. इसे सीमा पर IEDs की पहचान करने के लिए तैनात किया गया है. ताकि सीमा पर पेट्रोलिंग के दौरान भारत के जवानों की जान न जाए. दक्ष (Daksh) को बनाने में डीआरडीओ के अलावा टाटा मोटर्स, डायनालॉग, थेटा कंट्रोल्स और भारत इलेक्ट्रॉनिक्स लिमिटेड ने मदद की है. शुरुआत में दक्ष (Daksh) की 500 यूनिट्स को भारतीय सेना में भर्ती करने की योजना थी. फिलहाल अब तक देश के विभिन्न स्थानों पर 250 दक्ष तैनात हैं. यह पूरी तरह से आटोमेटिक है. इसमें रेडियो फ्रीक्वेंसी शील्ड लगी हुई है जो कि सिग्नल को जाम करके बम में विस्फोट होने से रोक

सकता है यह एयरपोर्ट पर किसी संदिग्ध सामान को छांटकर उसकी जांच कर सकता है. या फिर उसे बाहर ले जाकर नष्ट कर सकता है. इसमें रोबोटिक हाथ लगे हैं जो किसी चीज को उठा सकता है. नष्ट भी कर सकता है. यह बायोलॉजिकल, केमिकल और रेडियोलॉजिकल हथियारों को नष्ट कर सकता है. दक्ष (Daksh) जैसे कई रोबोट्स हैं जो दुनिया भर में अलग-अलग देशों की सेनाओं और बम निरोधक दस्तों की मदद कर रहे हैं. कुछ स्थानों पर तो मशीन गन और असॉल्ट राइफल से लैस रोबोट्स सीमा पर तैनात भी है. इनका उपयोग आप सीमा पर, शहरी लड़ाई, आतंकरोधी मिशन में दूर से कर सकते हैं.

https://www.aajtak.in/india/news/photo/drdo-daksh-remotely-operated-vehicle-know-its-robots-name-all-you-need-to-know-karnal-pakistan-terror-khalistan-tstrd-1458298-2022-05-05-5

Thu, 05 May 2022

DRDO to get KILO class submarine from Indian Navy

This sub will be used as a research vessel for the development of next-generation systems and components for the development of 12 indigenous submarines. DRDO will get a KILO class submarine from the Indian Navy to test the Electric Propulsion motor, Li-ion battery, AIP, and other Technologies. This sub will be used as a research vessel for the development of next-generation systems and components for the development of 12 indigenous submarines. These submarines will go into to manufacturing 2030.

Formalities are being a workout for the transfer of a Kilo-class submarine that will be drydocked to be used as a test platform for the testing of the prototype Lithium-Ion battery system with a Battery Management system (BMS) to validate its energy output and various discharge rates. DRDO's AIP technology is based on a Phosphoric Acid Fuel Cell that already has been demonstrated on a land-based prototype and DRDO had proposed Navy to loan them a Kilo-class submarine to be used as a research vessel for the AIP system but now it might be fully converted into as a research vessel for many of the systems. Indigenous 5MW Electric Propulsion motor might be next in line to be used for further experimenting with the propulsion system.

https://www.psuconnect.in/news/drdo-to-get-kilo-class-submarine-from-indian-navy/32434

DRDO On Twitter

Defence News

Defence Strategic: National/International

IDN INDIAN DEFENCE NEWS
Global Defence, Aerospace & Security

Fri, 06 May 2022

Defence ministry engages with private players to manufacture military items

The Indian Air Force Wednesday reached out to the domestic defence industry seeking their response on manufacturing eight military items, including simulators for Apache and Chinook helicopters, and communication systems. Besides that, three projects of the army, an Indian light tank, an autonomous combat vehicle, and integrated surveillance and targeting system for mechanised forces, too, have been offered to the Indian industry for design and development under the categories of Defence Acquisition Procedure (DAP)-2020.

The move aims at rolling out the government's initiative to indigenise large parts of the defence procurement of three services of the army, air force, and navy, which are heavily dependent on imports. The industry will be provided financial support for the prototype development of these projects, said the Defence Ministry."This is for the first time since the launch of Industry friendly DAP-2020 that Indian Industry has been involved in the development of big-ticket platforms such as Light tank and Communication Equipment with Indian Security protocols," the Ministry pointed out indicating the seriousness of the exercise. The IAF, which organised a webinar, gave different presentations to the industry representatives to create awareness about the eight projects, three of them under Make-I and another five under Make-II categories, said the IAF.

Details of the Meeting

The idea was to introduce and let the private industry know the IAF expectations and also hear their problems, said the air force sources present at the meeting. “Now, they have to come back with proposals on each of the projects briefed to them virtually,” the sources added The list of projects was accorded ‘Approval In-Principle (AIP)’ by the collegiate committee of the Defence Ministry. Other projects of the IAF Airborne Electro-Optical pod with Ground-Based System, Wearable Robotic Equipment for Aircraft Maintenance, Airborne Stand-off Jammer and Design & Development of Automatic Take-Off/Landing Recording System (ATORS). The IAF interaction with private players through the webinar was organised by the Society of Indian Defence Manufacturers (SIDM) — the apex body of the Indian defence industry.

http://www.indiandefensenews.in/2022/05/defence-ministry-engages-with-private.html?m=1

FINANCIAL EXPRESS
Read to Lead

Thu, 05 May 2022

Indian Navy to test Super Hornet fighters: Boeing CEO heading to India, to discuss P-8i delivery?

The aircraft has completed ski-jump tests successfully in 2020 and there have been extensive simulated studies. And when the aircraft reach India soon, they will prove this with more operational demonstrations. For flight trials, US manufacturer Boeing is planning to send two F/A-18E/F Super Hornet fighter aircraft to an Indian Navy test facility in Goa for Ski-jump trials soon. The aerospace giant has pitched its twin-seater F/A-18 E/F Block III Super Hornet which can operate from a ski-jump’ ramp and can also be an enabler for secure Indo-Pacific. The aircraft has completed ski-jump tests successfully in 2020 and there have been extensive simulated studies. And when the aircraft reach India soon, they will prove this with more operational demonstrations.

This twin-engine fighter jet if down selected will be competing with Dassault Aviation’s Rafale Marine which has been recently upgraded and France is ready to offer the same for the requirement of Indian Navy’s soon to be commissioned first indigenous aircraft carrier (IAC). This IAC will be going to Eastern Naval Command later this year as has been reported earlier by Financial Express Online.

Is the CEO of Boeing heading to India?

Though no official dates have been declared, David L Calhoun, CEO& President of Boeing Company is likely to meet with the top officials in the Ministry of Defence when he visits India. According to the buzz in the corridors of South Block, he is expected to fly to India soon. His visit comes close on the heels of his recent meeting with defence minister Rajnath Singh ahead of the 2+2 Indo-US ministerial dialogue in Washington DC. India's defence minister had met with Boeing and Raytheon – two major aerospace & defence companies to take advantage of the government's Make in India initiative and to move towards 'Make for the World'.

What is STOBAR?

According to top Boeing officials, the aircraft that is being offered to India is a multi-role, and most advanced, frontline fighter of the US Navy (USN). It is the workhorse for the fleet of the US Navy. In an earlier interaction with Financial Express Online, top Boeing officials had said the twin engine aircraft are capable of operating from the Indian Navy aircraft carriers. And they will meet or even exceed the short take-off (STOBAR) performance requirements. This is a system which is used for either launching an aircraft or recovery of an aircraft from the deck of an aircraft carrier. Financial Express Online has reported earlier that the US Company has fielded not only F/A-18 Super Hornet for the Indian Navy, but also F-15EX for Indian Air Force's requirement of 114 fighters and KC-46 tanker for aerial refueling and ISR capabilities.

More P-8i?

Future of six P-8i that the government was planning to acquire is uncertain. Sources have confirmed to Financial Express Online that in March the Indian side asked the company to hold the commercial bid validity until July 2022. The commercial bid was to expire in March 2022. As reported, the P8I has fulfilled Indian Navy's need for a long range maritime surveillance and anti-submarine warfare (ASW) requirements in the Indian Ocean Region. Since its induction in 2013, the aircraft has logged almost 35,000 flight hours and has supported the Indian Navy in its missions.

Is the Boeing Company looking at setting up MRO for P-8?

For providing MRO services, the company could possibly look at setting up a facility here. According to industry sources, recently the company officials had discussed Anti-Submarine Warfare (ASW) capable Long Range Maritime Reconnaissance Aircraft P8's MRO. Countries like Australia (QUAD member) are flying P-8A. Boeing Company already has more than 275 Indian suppliers who are part of the long supply chain and manufacturing and delivering parts and complex assemblies for both military and commercial aircraft. These include the Apache, Chinook, C-17, F/A-18, F-15, P-8, and T-7, including P-8I.

Atmanirbhar Bharat and Make in India

The US-based company is already supporting India in its two major initiatives and more that USD 1 billion worth products are sourced from India for the global aerospace market.

Rafale Marine Vs F/A-18E/F Super Hornet

Recently, a French publication La Tribune has reported that the government of France is studying a possible sale of four used Rafale Marine jets to the Indian Navy. La Tribune reported France had been studying the sale of used Rafale Marine jets to gain an edge to win the larger contract from the Indian Navy. According to the French publication 'F3-R' is the current

production standard of the Rafale fighter jets that have the capability to fire the Meteor long-range air-to-air missile and can also be equipped with upgraded sensors and electronics.

India office set to welcome new VP

Soon, new Vice president of Boeing's India Business Development Alain Garcia will arrive in India.

https://www.financialexpress.com/defence/indian-navy-to-test-super-hornet-fighters-boeing-ceo-heading-to-india-to-discuss-p-8i-delivery/2513185/lite/

THE ECONOMIC TIMES

Thu, 05 May 2022

Boeing, air works work on maintenance of P-8I warfare aircraft

American plane maker Boeing and India MRO company Air Works are currently undertaking heavy maintenance checks on three P-8I long-range maritime patrol and anti submarine warfare aircraft operated by the Indian Navy (IN) simultaneously at Air Works' facility in, Hosur. "This dramatically increases the scope and scale of Maintenance, Repair and Overhaul (MRO) undertaken in the country and demonstrates both the companies' commitment in helping make India *Aatmanirbhar* in aerospace and defence. Boeing India and Air Works will commemorate their collaboration at the Boeing India *Aatmanirbharta* in Defence Conference being organized in New Delhi on Tuesday, May 10, 2022, with participation from dignitaries from the Indian Navy, Air Works Group, and other key supplier-partners," said a statement.

"We are proud to build on our existing collaboration with Air Works that enables us to generate significant value for our defence customers in India, and contribute towards the Government's vision of making India an MRO hub for the region. The ongoing satisfactory execution of heavy maintenance checks on three P-8I platforms concurrently by Air Works is a remarkable achievement." said Surendra Ahuja, managing director, Boeing Defence Boeing's strategic collaboration with Air Works was a the first step under the Boeing India Repair Development and Sustainment (BIRDS) hub launched last year.

The BIRDS hub entails collaboration with key local companies and businesses to develop India into an aviation and defence repair and sustainment hub. The Boeing and Air Works collaboration has already been enabling faster turnarounds and enhanced operational capability within the country for the country's key defence platforms. The partnership began with the first P-8I aircraft Phase 32 checks, and has grown to include Phase 48 checks and MRO on the landing gear of the Indian Air Force's 737 VVIP aircraft.

https://economictimes.indiatimes.com/news/defence/boeing-air-works-work-on-maintenance-of-p-8i-warfare-aircraft/articleshow/91339057.cms?from=mdr

JANES

Thu, 05 May 2022

US Army greenlights IVAS initial operational test and evaluation for mid-May

The US Army will begin operational testing with Microsoft's militarised HoloLens 2 augmented reality (AR) system later in May, according to Doug Bush, the service's assistant secretary for Acquisition, Logistics, and Technology. This move follows a mid-2021 decision to delay the crucial event, and ultimately fielding, to solve hardware and software problems. Bush told *Janes* during a 4 May interview that he decided to greenlight the initial operational test and evaluation (IOT&E) after reviewing findings from the Integrated Visual Augmentation System (IVAS) Soldier Touchpoint 5 event in March.

“We appear to have [made] progress on the technical areas that led us to delay the IOT&E,” he noted. “Generally, the feedback was positive, and it was good enough for me to authorise going into the operational test.” During Soldier Touchpoint 4 around the April 2021 timeframe, the service discovered several problems with the device involving display clarity, IVAS Project Manager Colonel Troy Denomy told *Janes* in October 2021. Programme officials decided to postpone IOT&E from July 2021 to May 2022, while it worked with Microsoft on several fixes and then tested them out.

More specifically, these changes included shrinking the heads-up display's field-of-view from 80° down to 70°, fixing a moisture issue with a single component inside the display, and addressing several software ‘reliability and stability' issues, Col Denomy said at the time. “As you make changes to hardware, there's almost always a corresponding change to software,” the IVAS project manager continued. For example, when it came to reducing the field-of-view, the army and the company needed to ensure that the software ‘understands' that this view is reduced, and images are correctly displayed.

With Soldier Touchpoint 5 completed, the army is heading into IOT&E with the intent to stress the system further and collect additional data. If it decides that this initial IVAS iteration is ready for production, soldiers could begin receiving it by the end of September. “We'll know when we have our conclusive test results, but the reliability of the system was significantly better … than it was last year,” Bush said. “Hopefully we see that carry through the operational test.”“If IOT&E gives us the results we want, we are ready to go [into production],” he later added.

Meanwhile, the Department of Defense Office of Inspector General (DoD OIG) released an IVAS audit report in April warning that the army, and specifically Bush's office, had not clearly defined metrics for assessing soldier feedback, which could result in wasteful spending. Although army testing officials used soldier feedback to make system changes, they did not properly “define minimum user acceptance levels to determine whether IVAS would meet user needs”, the OIG said. “This occurred because army policy did not require programme officials to define suitable user acceptance levels,” the OIG wrote in the public report. “Procuring IVAS without attaining user acceptance could result in wasting up to USD21.88 billion in taxpayer funds to field a system that soldiers may not want to use or use as intended.”

Three recommendations are included in this heavily redacted report, all of which the army disagreed with or that remain unresolved to some extent. These included – a service-wide policy requiring programme officials to define suitable user acceptance measurements for testing and evaluation; clearly measuring user acceptance levels to meet user needs before Soldier Touchpoint 5 testing; and Bush's office verifying whether the Program Executive Office Soldier met the established user acceptance measures and addressed soldier-identified issues before production. “I think the army is actually doing what the [OIG] report wants, which is involving lots of soldiers in developing the system's requirements and then testing it and getting their feedback,” Bush told *Janes* . “I think the difference of opinion was how you're measuring that. So, we're really on a fine edge of disagreement here.”

“What we have for the programme is a set of technical performance criteria to determine if it is going to be effective in combat,” he furthered. “In addition to that, we will take feedback on how soldiers use it and then observe how they use it. This is why we do operational testing.”

https://customer.janes.com/Janes/Display/BSP_21313-JDW?ReturnUrl=https%3A%2F%2Fwww.janes.com%2Fdefence-news%2Fc4isr-command-tech%2Flatest%2Fus-army-greenlights-ivas-initial-operational-test-and-evaluation-for-mid-may

DefenseNews

Fri, 06 May 2022

US Army’s budget lacks plan to buy protection system for Bradley vehicles

The U.S. Army late last year was nearly done with required testing to integrate a protection system on its Bradley combat vehicle fleet, but the service still isn’t seeking money to buy the Iron Fist in its next budget. The Army had encountered technical problems and funding gaps in its effort to field the active protection system on the Bradley Infantry Fighting Vehicle. Brig. Gen. Glenn Dean, the program executive officer for Army ground combat systems, told Defense News in the fall that Iron Fist was nearing completion of the majority of required testing. According to fiscal 2023 budget justification documents, the Army planned to wrap up testing and integration work by the end of FY22, but the documents provided no further timeline or funding.

“We’re essentially reaching the point where we’re just waiting for resources, whether Army- or congressionally provided, to proceed into procurement,” Dean said. The Bradley Iron Fist Light Decoupled program, or IF-LD, received additional FY22 congressional funding — a total of $16 million — to continue a second round of testing and the completion of documentation in support of procuring a single brigade’s worth of IF-LD systems. “No procurement funds have been identified to procure IF-LD systems at this time,” the Army’s Program Executive Office Ground Combat Systems confirmed.

An Army spokesperson also told Defense News in a statement that the service “will review the IF-LD test data and look for opportunities in the future to fund this requirement.” Iron Fist was developed by IMI Systems. Israeli firm Elbit Systems, which bought IMI, partnered with

American company General Dynamics Ordnance and Tactical Systems to integrate the system to serve as an interim active protection system for the Bradley. The system is meant to provide the Bradley with protection from rocket-propelled grenades, anti-tank guided missiles and other threats. The Army Requirements Oversight Council in November 2018 opted to field one brigade by the end of the fourth quarter of FY20.

Despite the council's decision, the Bradley couldn't supply enough power to the launcher system, and the Iron Fist experienced counter-munitions dudding in testing. Those issues delayed the program by about a year. In earlier testing, "we had some issues with Iron Fist, mostly maturity issues, and it's centered around power within the Iron Fist system itself and a problem with the ignition train within the interceptor," Tim Neaves, General Dynamics Ordnance and Tactical Systems senior business development director, told Defense News last fall.

Coming out of those tests, Neaves said, the company worked with the Army to find a solution, which included internal investment to continue development and tests. The company has worked on that solution for the last 18 months. "We've gotten to the point where we've demonstrated that we have fixed those issues, and we've gotten a significant maturity level and performance demonstration within the system," Neaves said. The system, he explained, was put up against roughly 400 threats including single and dual-warheads, anti-tank guided missiles, rocket-propelled grenades and recoilless rifles.

In 2016, the Army determined it needed an interim active protection system for Abrams tanks, Stryker combat vehicles and Bradley vehicles, and so the service decided to rapidly assess off-the-shelf APS systems to fulfill that urgent need. The Army has already fielded the Rafael-developed Trophy APS on Abrams tanks. Troops have used those in the European theater for more than a year now. But the service also ran into problems finding an effective system that would work on the Stryker, and it is yet to decide on a way forward. Sen. Gary Peters, D-Mich., recently cited the effective use of Javelin anti-tank guided missile systems against Russian tanks and armored vehicles in Ukraine. "The broad range of affordable, easy-to-operate ATGMs has certainly changed the calculus of armor on the battlefield," he said May 5 during an Army posture hearing of the Senate Armed Services Committee.

"Other countries around the world, some of our allies, have embraced the solution and have been putting it on their armored vehicles in a pretty aggressive way," Peters said of active protection systems. "The U.S. seems to be somewhat reluctant, with the exception of a small amount of our Abrams tanks that have the systems. Like, the Army doesn't seem to have a plan to test and field anti-protection systems for the entire fleet of Strykers, for example, or other armored vehicles." Army Secretary Christine Wormuth responded that the service is closely watching the war in Ukraine and is "certainly very concerned about threats to our tanks."

"I think that the protection systems that we have on our Abrams, on our Strykers are quite good," she said, adding that she's willing to look into more detail on the Army's next steps. "There is a balance between how quickly we can modernize some of our enduring platforms, like Stryker, while also modernizing." The Army is working on a vehicle protection suite, according to FY23 budget justification documents, that will establish a variety of capabilities through a base kit, or VBK, to "develop configurable vehicle Survivability Sets that will mitigate existing protection gaps, allow for future technology insertion to meet evolving threats, and minimize the impact to the current capabilities hosted on Army ground combat and tactical vehicle platforms."

The Army held a rodeo with vendors in 2021 for a laser warning capability for the system. It selected Danbury Mission Technologies' AN/VVR-4 Laser Detecting Set in February. The company was part of Collins Aerospace but was spun-off during the United Technologies Corporation and Raytheon merger. The laser warning capability is the first of its type to be integrated with the Army's common interface and controller, which Lockheed Martin is developing after winning a contract in February. Base kit integration is to take place through FY24 across Bradley, Abrams, Stryker and the Armored Multipurpose Vehicle. A procurement contract award will take place in the second quarter of FY23, according to budget documents.

Survivability improvements will roll into the capability through FY26, with a procurement decision on a way to defend against threats attacking from above — like drones — in the second quarter of FY24, and an integration decision on soft-kill capabilities in the first quarter of FY27, per the documents. A trade study for the vehicle protection suite is ongoing and is expected to finish mid-FY23, budget documents noted.

https://www.defensenews.com/land/2022/05/05/us-armys-budget-lacks-plan-to-buy-active-protection-system-for-bradley-vehicles/

BREAKING DEFENSE

Thu, 05 May 2022

Sweden seeking security 'assurances,' ahead of NATO move; US exercise on table?

Sweden is in discussions with various alliance members about how to shore up its national security ahead of any Russian counter-moves to a potential NATO application, Sweden's ambassador to Washington said today. After years of declining to join the alliance, both Finland and Sweden are expected to announce plans to become its 31st and 32nd members in the coming weeks. The date being eyed by observers is May 13, when Sweden's government will deliver a report on whether to make the move or not. There have been multiple reports from both nations that the decision is all but final, and that the two nations plans to move in sync for a joint membership. Speaking at a Washington Post event, Sweden's ambassador to the US, Karin Olofsdotter, acknowledged that the period between announcing its intent to join NATO and actually being admitted would be "quite dangerous" for Sweden. As a result, she said, Stockholm has been reaching out to see what kind of aid it could line up in case of need.

"We are not asking for any guarantees, in this interim period, if that should happen, because guarantees you can only get as a full member of the alliance," she said. Instead, "we have asked what other NATO members could do to help us out in this time to raise the threshold" for a Russian attack, something she described as seeking "security assurances" from the alliance members.In essence, by asking for "assurances" instead of "guarantees," Sweden is acknowledging that an Article 5 kind of commitment isn't on the table — should Russia invade, it will not trigger direct retribution from the NATO nations, something that could prove politically and legally hard for some of the members to agree to. But there are still ways that the NATO states, and most importantly the big players of the US, UK, and Germany, can work now to deter Russia from taking actions.

There may be something in the works already, with Foreign Minister Ann Linde telling a Swedish tv channel on May 4 that "naturally, I'm not going to go into any details, but I feel very sure that now we have an American assurance" of help. No further details were made available from Linde, but the ambassador provided some potential ideas. Olofsdotter pointed to strong political statements from London and Berlin over recent days as one example, and highlighted disinformation and cyber security as areas where the NATO nations could perhaps help Sweden. Finally, she floated a particularly interesting idea: increasing the number of exercises occurring in Sweden by the NATO nations.

"What one could envisage is, we already have a quite strong exercise program and we have been in NATO exercises for a long time, we've been in partnership to NATO," she said. "So one could envisage that we beef up the exercise program that we already have. One could envisage more presence, maybe naval presence from vessels from NATO countries." Unsaid in those comments is that having American, British or other forces in Sweden could work to deter Russia by providing something of a trigger line — attacking the Swedish military would risk killing American forces, for instance, which would in turn increase the chances of Washington committing wholeheartedly to a conflict with Moscow.

https://breakingdefense.com/2022/05/sweden-seeking-security-assurances-ahead-of-nato-move-us-exercises-on-table/

TheDefensePost

Thu, 05 May 2022

ASRAAM block 6 missiles achieves initial operating capability

The most recent version of the Advanced Short Range Air-to-Air Missile (ASRAAM) has achieved Initial Operating Capability, *UK Defence Journal* has reported. The ASRAAM Block 6 will be integrated with the UK's Eurofighter Typhoon in 2022 and the F-35 in 2024. The missile features "upgraded sub-systems built-in cooling and a new British-built seeker with more pixels," unlike its previous version with a US-built seeker, the outlet added.

No US-built Components

Having no US-built components allows the missile to be exported without the International Traffic in Arms Regulations (ITAR) restrictions. ITAR requires US approval for exports of arms that feature American-built components. Washington refused a request to sell the earlier missile to Saudi Arabia. The missile has a range of over 25 kilometers (15.53 miles) and "accepts target information via the aircraft sensors, such as the radar or helmet mounted sight but can also act as an autonomous infrared search and track system," according to the manufacturer. The Royal Air Force, Navy, and Indian Air Force currently operate the missile.

https://www.thedefensepost.com/2022/05/05/asraam-missile-initial-operating-capability/

THE ECONOMIC TIMES

Thu, 05 May 2022

India, France agree on deeper French involvement in *'Atmanirbhar Bharat'* efforts in Defence sector

Welcoming the ongoing "intense cooperation" across all defence domains, India and France have agreed to find "creative ways" for "deeper involvement" of French companies in 'Atmanirbhar Bharat' efforts in defence technology, manufacturing and exports. A joint statement issued after Prime Minister Narendra Modi met French President Emmanuel Macron here on Wednesday underscored that the long-standing armament cooperation is testimony to the mutual trust between the two countries. "Both sides welcomed the ongoing intense cooperation across all defence domains," it said, noting that joint exercises (Shakti, Varuna, Pegase, Desert Knight, Garuda) illustrate efforts towards better integration and interoperability wherever possible.

As seen in the timely delivery of the Rafale fighter jets despite the pandemic, the two sides enjoy synergy in the field of defence. "Taking forward this momentum, and based on their mutual trust, both sides agreed to find creative ways for France's deeper involvement in the 'Atmanirbhar Bharat' (Self-reliant India) efforts in advanced defence technology, manufacturing and exports, including through encouraging increased industry to industry partnerships," the joint statement said. At a special media briefing, Foreign Secretary Vinay Kwatra said the context of defence partnership between India and France is defined by not just trade in different platforms, but it also extends to co-development, co-designing, co-manufacturing.

"And I think what you also need to keep in mind is that this is also very much in sync and in line with our own domestic policy of 'Aatmnirbharta', which also of course extends very strongly into the field of defence," he said in response to a question. "So, I think discussions today in the field of defence were focused more on how the two countries can partner more strongly in the field of co-designing, co-development, co-production of different defence equipment in India," Kwatra said. In the joint statement, both sides also reaffirmed the commitment to the success of the strategic Jaitapur EPR project for access to reliable, affordable and low carbon energy, and welcomed the progress achieved over the last months. They will increase the contacts in the coming months to achieve new progress. The statement underscored that the maritime cooperation between India and France has reached "new levels of trust" and will continue through exercises, exchanges and joint endeavours throughout the Indian Ocean.

The six Scorpene submarines built at MDL in Mumbai illustrate the level of transfer of technology from France to India, in line with the "Make in India" initiative, it noted. India and France have strengthened cooperation between their cyber security agencies in an increasingly digitalised world. "Based on a convergent outlook, they agree to join forces in promoting cyber norms and principles in order to counter cyber threats and agree to upgrade their bilateral cyber dialogue with a view to contributing to a peaceful, secure and open cyberspace," the statement said. Building upon the implementation of the Indo-French roadmap on cyber security and digital technology, India and France reiterate their willingness to deepen their cooperation on exascale technology, based upon the fruitful collaboration between C-DAC and ATOS, which includes

making supercomputers in India, it said.The two sides also agree to work together for more secure and sovereign 5G/6G telecom systems. Both sides agreed to maintain a strong coordination in the framework of the G20. France reiterated its steadfast support for India's bid for a permanent membership of the UN Security Council as well as membership in the Nuclear Suppliers Group (NSG).

Building on a great tradition of over 60 years of technical and scientific space cooperation, and in order to address the contemporary challenges that have arisen in space, in particular maintaining a secure access to space for all, India and France have also agreed on setting up a bilateral strategic dialogue on space issues. "It will bring together experts from space and defence agencies, administration and specialised ecosystem to discuss security and economic challenges in outer space, the norms and principles applicable to space as well as unveil new areas of cooperation. The two sides agreed to hold the first dialogue this year at the earliest," the statement said.

https://m.economictimes.com/news/defence/india-france-agree-on-deeper-french-involvement-in-atmanirbhar-bharat-efforts-in-defence-sector/amp_articleshow/91340727.cms

The Indian EXPRESS

Thu, 05 May 2022

PM Modi, France's Macron talk Defence cooperation, voice 'serious concern' over Ukraine

India and France underscored that the "long-standing armament cooperation is testimony to the mutual trust between the two sides. Prime Minister Narendra Modi and France's Emmanuel Macron Wednesday discussed the situation in Ukraine and the defence cooperation in their first bilateral meeting since the French President got re-elected last month after a tough election. The two leaders met in Paris late on Wednesday, and a readout of their meeting came early Thursday. Modi, who was on a trip to Germany and Denmark, made a brief stopover to meet Macron in Paris on his way back to New Delhi.

The joint statement said, "France reiterates its strong condemnation of the unlawful and unprovoked aggression against Ukraine by Russian Forces" — a unilateral statement showing the divergence between New Delhi and France. But it also said, "India and France expressed serious concern at the ongoing conflict and humanitarian crisis in Ukraine. They unequivocally condemned civilian deaths in Ukraine and called for an immediate cessation of hostilities to bring parties together to promote dialogue and diplomacy to find an immediate end to the suffering of the people. Both countries underlined the need to respect the UN Charter, international law and the sovereignty and territorial integrity of states. The two leaders discussed the regional and global implications of the conflict in Ukraine and agreed to intensify coordination on the issue."

It also said that India and France express "deep concern about the current aggravation of global food security and nutrition, already impacted by the Covid-19 pandemic, and especially in developing countries They are committed to enabling a coordinated, multilateral response to

address the risk of aggravated food crisis because of the conflict in Ukraine, including through initiatives such as the Food and Agriculture Resilience Mission (FARM), which aims at ensuring well-functioning markets, solidarity and long-term resilience". On defence cooperation, both sides welcomed the ongoing intense cooperation across all defence domains. Joint exercises (*Shakti, Varuna, Pegase, Desert Knight, Garuda*) that "illustrate efforts towards better integration and interoperability wherever possible".

India and France underscored that the "long-standing armament cooperation is testimony to the mutual trust between the two sides. The six Scorpene submarines built at MDL in Mumbai illustrate the level of transfer of technology from France to India, in line with the "Make in India" initiative." "As seen in the timely delivery of the Rafale despite the pandemic, the two sides enjoy synergy in the field of defence. Taking forward this momentum, and based on their mutual trust, both sides agreed to find creative ways for France's deeper involvement in the "Aatmanirbhar Bharat" (Self-reliant India) efforts in advanced defence technology, manufacturing and exports, including through encouraging increased industry to industry partnerships,", the joint statement said.

Meanwhile, the statement also said, "maritime cooperation between India and France has reached new levels of trust and will continue through exercises, exchanges and joint endeavours throughout the Indian Ocean". On Indo-Pacific, the joint statement said that India and France have "built one of the premier strategic partnerships for advancing peace, stability and prosperity in the Indo-Pacific region. They share a vision of a free, open and rules-based Indo-Pacific region, based on the commitment to international law, respect for sovereignty and territorial integrity, freedom of navigation and a region free from coercion, tensions and conflicts."

It added that the Indo-France Indo-Pacific partnership encompasses defence and security, trade, investment, connectivity, health, and sustainability. Besides bilateral cooperation, India and France will continue to develop new partnerships in various formats with like-minded countries in the region and within regional organisations, it said. The first Indo-Pacific Ministerial Forum held in Paris in February 2022 during the French presidency of the Council of the EU launched an ambitious agenda at the EU level based on the EU Strategy for Cooperation in the Indo Pacific.

https://indianexpress.com/article/india/pm-modi-frances-macron-talk-defence-cooperation-voice-serious-concern-over-ukraine-7902269/

NewsOnAIR

Fri, 06 May 2022

From Rafale to Scorpene Submarines, the deepening of India-France defence ties

In the one-on-one delegation-level talks, the two leaders held discussions on the entire range of bilateral issues, including cooperation in defence, space, blue economy, and civil nuclear. Besides bilateral cooperation, the Indo-France partnership today encompasses defence and security, connectivity, technical & scientific space cooperation, and beyond. This article focuses

on the defence ties of both nations along with recent initiatives being taken to give a major fillip to combat capabilities.

The Saga of Defence Dialogues

India and France have a Ministerial level Defence dialogue, which has been held annually since 2018. The three services (Indian Army, Indian Navy, and Indian Air Force) also have regular defence exercises; viz. Exercise Shakti (Indian Army last participated in the Indo – France joint military exercise in November 2021 in France), Exercise Varuna (Indian Navy participated in the 20th edition of the Indo-French bilateral Naval exercise 'Varuna-2022' in April 2022) Exercise Garuda (Indian Air Force participated in the bilateral Indo-French large force employment warfare exercise in July 2019). Further in the recent meeting of the Prime Minister and French President both sides welcomed the ongoing intense cooperation across all defence domains. They noted that Joint exercises like (Shakti, Varuna, Pegase, Desert Knight, Garuda) illustrate efforts for better integration and interoperability wherever possible.

The Maritime Camaraderie and Project P-75

Maritime cooperation between India and France has reached a notch higher through new levels of trust through exercises, exchanges, and joint endeavors throughout the Indian Ocean. The proof in the pudding is 'P-75 Scorpene Project', under which six Scorpene submarines have been built by state-owned Mazagon Dockyard Limited (MDL) by the Transfer of Technology (ToT) from France under the 'Make in India' initiative. Importantly, the Scorpene-class submarines are one of the most advanced conventional submarines in the world, which are equipped with superior stealth features, such as low radiated noise levels, advanced acoustic silencing techniques, and the ability to attack with precision-guided weapons on board.

The contract for six Scorpene submarines from DCNS (Naval Group) was inked in October 2006. Under the deal, the first submarine INS Kalvari was commissioned in December 2017, while the second INS Khanderi was commissioned in September 2019.

The third scorpene class submarine INS Karanj was commissioned on 10 March 2021 and the Fourth Submarine, INS Vela was commissioned in the Indian Navy in November 2021. Besides this, the Fifth Submarine Vagir is under the Sea trials phase, whilst the sixth and last Submarine will also undergo Sea trials after launching. The Scorpene project has received the unconditional support, course correction, and active encouragement of the Department of Defence Production (MoD) and the Indian Navy throughout its various phases of construction.

Rafale's Reconnaissance

The purchase of Rafale aircraft can be considered the most historic step in the deepening of India-France defence ties. The Intergovernmental Agreement for the purchase of 36 Rafale fighter aircraft (30 fighter aircraft and 6 trainers) by India in flyaway condition was signed in New Delhi on 23 September 2016. As of February this year, India has now received 35 of the 36 Rafales. The twin-engine Rafale jets are capable of carrying out a variety of missions including ground and sea attacks, air defence and air superiority, reconnaissance, and nuclear strike deterrence.

https://newsonair.com/2022/05/05/from-rafale-to-scorpene-submarines-the-deepening-of-india-france-defence-ties/

Hindustan Times

Fri, 06 May 2022

Defence minister Rajnath Singh makes indigenisation pitch, cites Ukraine conflict

Defence minister Rajnath Singhj said recent conflicts, especially the situation in Ukraine, indicate that not just defence supplies, but commercial contracts are also prone to be affected Defence minister Rajnath Singh on Thursday made a strong pitch for achieving 'aatmanirbharta' (self-reliance) in the defence sector and other spheres while referring to the possible fallout of the ongoing Russia-Ukraine conflict that has driven home the message to become self-reliant. "Our past experiences have taught us that India cannot depend on imports. Recent conflicts, especially the situation in Ukraine, have told us that not just defence supplies, but commercial contracts are also prone to be affected when it comes to national interests," Singh said, while delivering the 37th Air Chief Marshal PC Lal Memorial Lecture.

The event was attended by Indian Air Force chief Air Chief Marshal VR Chaudhari, Air Force Association president Air Chief Marshal RKS Bhadauria (retd) and senior officers of the air force. His comments came at a time when complications from the sanctions imposed on Russia by the US and its allies on the back of the war in Ukraine have posed new challenges for the India-Russia defence relationship and assigned fresh urgency to reduce dependence on imported military hardware to stay battle-ready.

The global backlash against Russia has also raised questions about the fate of new projects and spares procurement for existing Russian-origin weapons, maintenance and servicing of legacy equipment and creating an alternative payment system for defence trade with Russia amid the banking sanctions. Self-reliance in defence has been India's focus during the last five-six years, and the country has made noticeable progress, said former director-general of military operations Lieutenant General Vinod Bhatia (retd). "The Ukraine crisis, and its fallout, has given new impetus to indigenisation. Strategic autonomy comes with self-reliance," Bhatia said.

The minister said that the steps taken by the government to boost self-reliance will empower domestic manufacturers and help India emerge as an exporter of military hardware. In a renewed push for self-reliance, India imposed a phased ban on the import of 310 different weapons and systems during the last two years, and also earmarked funds in the defence budget for buying military hardware from domestic manufacturers. Singh highlighted the importance of achieving greater synergy and collaboration among the defence services through joint vision, training, planning and execution of operations.

"The ongoing process of integration of the armed forces is aimed at not only increasing the combined capability, but also efficiency. There have been deliberations regarding the envisaged changes. This consultative process will continue till the implementation of the reforms," Singh said, stressing that the success of the reforms will depend as much on the vision of the planners as it will on those who implement it. India is working on a roadmap for the military's theaterisation to best utilise the resources of the three services for future wars and operations. India's first chief of defence staff (CDS) General Bipin Rawat was spearheading the

theaterisation drive. His death in a helicopter crash last December was seen as a setback to the ongoing military reforms.

"Theaterisation appeared to have taken a backseat after General Rawat's demise, but the minister's comments have shifted the focus on its speedy implementation," Bhatia added. To be sure, the government has still not appointed Rawat's successor. The current theaterisation model to enhance tri-service synergy seeks to set up four integrated commands -- two land-centric theatres, an air defence command and a maritime theatre command. The minister highlighted the need to leverage technology to defend the country against space-guided attacks and protect its space assets. "Steps are being taken by our adversaries for military use of space. This is likely to have an adverse effect on our interests. We need to identify and be fully prepared for the evolving challenges."

He said military planners also needed to assess the nature of future wars through a closer look at the situation in Syria, Iraq, Afghanistan, and the Ukraine conflict. "Although these trends are suggestive, but we can gain a deeper understanding by correlating them with our local threats." Singh said expensive weapons and platforms alone did not ensure victory, and it was critical to employ them innovatively. "Be it precision-guided munition, unmanned aerial vehicles or anti-tank weapons…Technology is a force multiplier, but without its innovative deployment, state-of-the-art equipment will be a mere display."

https://www.hindustantimes.com/india-news/defence-minister-rajnath-singh-makes-indigenisation-pitch-cites-ukraine-conflict-101651771735523.html

Science & Technology News

Thu, 05 May 2022

A new approach to reproduce human and animal movements in robots

In recent years, developers have created a wide range of sophisticated robots that can operate in specific environments in increasingly efficient ways. The body structure of many among these systems is inspired by nature, animals, and humans. Although many existing robots have bodies that resemble those of humans or other animal species, programming them so that they also move like the animal they are inspired by is not always an easy task. Doing this typically entails the development of advanced locomotion controllers, which can require considerable resources and development efforts.

Researchers at DeepMind have recently created a new technique that can be used to efficiently train robots to replicate the movements of humans or animals. This new tool, introduced in a

paper pre-published on arXiv, is inspired from previous work that leveraged data representing real-world human and animal movements, collected using motion capture technology.

"We investigate the use of prior knowledge of human and animal movement to learn reusable locomotion skills for real legged robots," the team at DeepMind wrote in their paper. "Our approach builds upon previous work on imitating human or dog Motion Capture (MoCap) data to learn a movement skill module. Once learned, this skill module can be reused for complex downstream tasks." A large part of the robot locomotion controllers developed in the past have modular designs, in which a system is divided into different parts (i.e., modules), which interact with each other. While some of these controllers have achieved promising results, developing them often requires significant engineering efforts. In addition, modular designs are typically task-specific, thus they do not generalize well across different tasks, situations, and environments.

As an alternative to these controllers, some researchers have proposed a method called "trajectory optimization," which combines a motion planner with a tracking controller. These approaches require less engineering than modular controllers, yet they often need to perform extensive computations and thus can be too slow to be applied in real-time. In their paper, Steven Bohez and his colleagues at DeepMind introduced an alternative approach for training humanoid and legged robots to move in ways that resemble the locomotion styles of humans and animals. Their technique summarizes the motor skills of humans and animals from data collected with motion capture technology, then uses this data to train real-world robots.

When developing their approach, the team completed four main stages. Firstly, they re-targeted motion capture data to real-world robots. Subsequently, they trained a policy to imitate desired motion trajectories in the motion capture data within a simulated environment. "This policy has a hierarchical structure in which a tracking policy encodes the desired reference trajectory into a latent action that subsequentially instructs a proprioception-conditioned low-level controller," the researchers wrote in their paper. After they trained this policy to imitate reference trajectories, the researchers were able to reuse the low-level controller, which has fixed parameters, by training a new task policy to output latent actions. This allows their controllers to replicate complex human or animal movements in robots, such as dribbling a ball. Finally, Bohez and his colleagues transferred the controllers they developed from simulations to real hardware.

"Importantly, due to the prior imposed by the MoCap data, our approach does not require extensive reward engineering to produce sensible and natural looking behavior at the time of reuse," the researchers wrote in their paper. "This makes it easy to create well-regularized, task-oriented controllers that are suitable for deployment on real robots." So far, the team at DeepMind evaluated their approach in a series of experiments, both in simulation and real-world environments. In these tests, they successfully used their technique to train the controller to replicate two main behaviors, namely walking and ball dribbling. Subsequently, they evaluated the quality of the movements achieved using their approach on two real-world robots: the ANYmal quadruped and OP3 humanoid robots.

The results collected by Bohez and his colleagues are very promising, suggesting that their approach could help to develop robots that emulate humans and animals more realistically. In their next studies, they would like to train their policies on new animal and human behaviors, to then try and replicate them in robots. "We want to extend our datasets with a larger variety of

behaviors and further explore the range of downstream tasks that the skill module enables," the researchers wrote in their paper.

https://techxplore.com/news/2022-05-approach-human-animal-movements-robots.html

Thu, 05 May 2022

The quest for an ideal quantum bit: New qubit breakthrough could revolutionize quantum computing

A new qubit platform could transform quantum information science and technology. You are no doubt viewing this article on a digital device whose basic unit of information is the bit, either 0 or 1. Scientists around the world are racing to develop a new type of computer based on the use of quantum bits, or qubits. In a paper published on May 4, 2022, in the journal *Nature*, a team led by the U.S. Department of Energy's (DOE) Argonne National Laboratory has announced the creation of a new qubit platform formed by freezing neon gas into a solid at very low temperatures, spraying electrons from a light bulb's filament onto the solid, and trapping a single electron there. This system has the potential to be developed into perfect building blocks for future quantum computers.

To realize a useful quantum computer, the quality requirements for the qubits are extremely demanding. While there are various forms of qubits today, none of them is optimal. What would make an ideal qubit? It has at least three sterling qualities, according to Dafei Jin, an Argonne scientist and the principal investigator of the project. It can remain in a simultaneous 0 and 1 state (remember the cat!) over a long time. Scientists call this long "coherence." Ideally, that time would be around a second, a time step that we can perceive on a home clock in our daily life. Second, the qubit can be changed from one state to another in a short time. Ideally, that time would be around a billionth of a second (nanosecond), a time step of a classical computer clock.

Third, the qubit can be easily linked with many other qubits so they can work in parallel with each other. Scientists refer to this linking as entanglement. Although at present the well-known qubits are not ideal, companies like IBM, Intel, Google, Honeywell, and many startups have picked their favorite. They are aggressively pursuing technological improvement and commercialization. "Our ambitious goal is not to compete with those companies, but to discover and construct a fundamentally new qubit system that could lead to an ideal platform," said Jin. While there are many choices of qubit types, the team chose the simplest one — a single electron. Heating up a simple light filament you might find in a child's toy can easily shoot out a boundless supply of electrons.

One of the challenges for any qubit, including the electron, is that it is very sensitive to disturbance from its surroundings. Thus, the team chose to trap an electron on an ultrapure solid neon surface in a vacuum. Neon is one of a handful of inert elements that do not react with other elements. "Because of this inertness, solid neon can serve as the cleanest possible solid in a vacuum to host and protect any qubits from being disrupted," said Jin. A key component in the team's qubit platform is a chip-scale microwave resonator made out of a superconductor. (The

much larger home microwave oven is also a microwave resonator.) Superconductors — metals with no electrical resistance — allow electrons and photons to interact together at near to absolute zero with minimal loss of energy or information.

“The microwave resonator crucially provides a way to read out the state of the qubit,” said Kater Murch, physics professor at the Washington University in St. Louis and a senior co-author of the paper. “It concentrates the interaction between the qubit and microwave signal. This allows us to make measurements telling how well the qubit works.”

“With this platform, we achieved, for the first time ever, strong coupling between a single electron in a near-vacuum environment and a single microwave photon in the resonator,” said Xianjing Zhou, a postdoctoral appointee at Argonne and the first author of the paper. “This opens up the possibility to use microwave photons to control each electron qubit and link many of them in a quantum processor,” Zhou added. The team tested the platform in a scientific instrument called a dilution refrigerator, which can reach temperatures as low as a mere 10 millidegrees above absolute zero. This instrument is one of many quantum capabilities in Argonne’s Center for Nanoscale Materials, a DOE Office of Science user facility.

The team performed real-time operations to an electron qubit and characterized its quantum properties. These tests demonstrated that the solid neon provides a robust environment for the electron with very low electric noise to disturb it. Most importantly, the qubit attained coherence times in the quantum state competitive with state-of-the-art qubits. “Our qubits are actually as good as ones that people have been developing for 20 years,” said David Schuster, physics professor at the University of Chicago and a senior co-author of the paper. “This is only our first series of experiments. Our qubit platform is nowhere near optimized. We will continue improving the coherence times. And because the operation speed of this qubit platform is extremely fast, only several nanoseconds, the promise to scale it up to many entangled qubits is significant.”

There is yet one more advantage to this remarkable qubit platform.“Thanks to the relative simplicity of the electron-on-neon platform, it should lend itself to easy manufacture at low cost,” Jin said. “It would appear an ideal qubit may be on the horizon.”

https://scitechdaily.com/the-quest-for-an-ideal-quantum-bit-new-qubit-breakthrough-could-revolutionize-quantum-computing/amp/