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समाचार पत्रों से चयनित अंश
Newspapers Clippings

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

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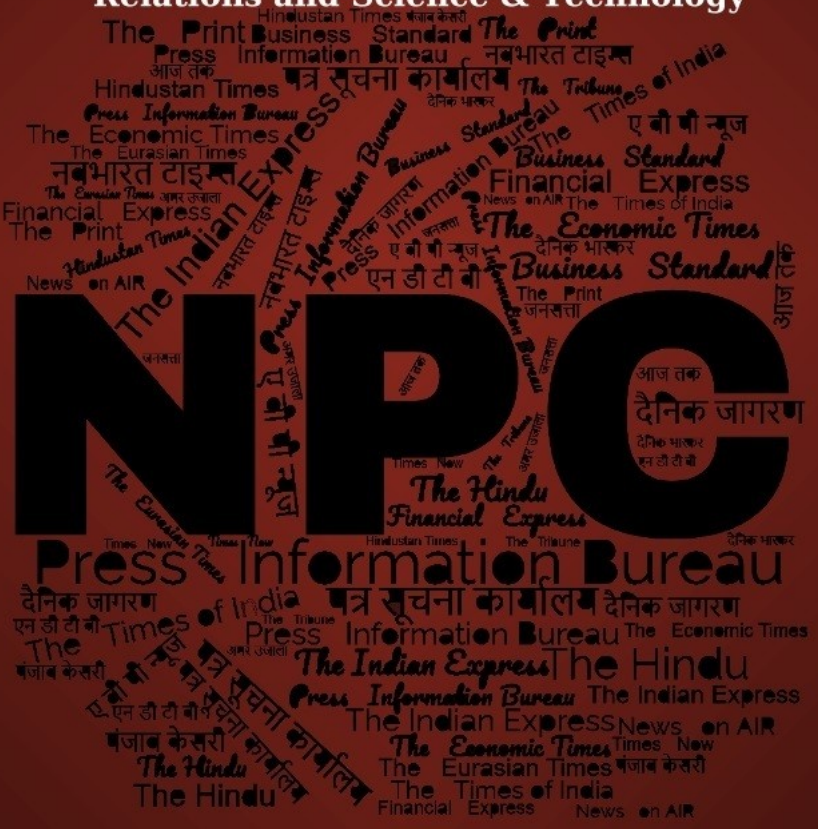

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DRDO News

DRDO Technology News

Mon, 05 Aug 2024

रक्षा क्षेत्र के लिए एयरफोर्स का बड़ा फैसला, **DRDO** और **BDL** को मिली अस्त्र मिसाइलों के उत्पादन की मंजूरी

भारतीय मिसाइल निर्माण क्षमताओं को बढ़ावा देने के लिए भारतीय वायु सेना ने अपने Su-3O और LCA तेजस लड़ाकू विमानों के लिए एस्ट्रा एयर टू एयर मिसाइलों के उत्पादन के लिए DRDO और BDL को मंजूरी दे दी है.

हाल ही में भारतीय वायु सेना के डिप्टी चीफ एयर मार्शल आशुतोष दीक्षित की हैदराबाद यात्रा के दौरान DRDO और BDL संयोजन को इस कार्यक्रम के लिए मंजूरी दी गई. सीनियर रक्षा अधिकारियों ने इंडिया टुडे को बताया कि DRDO इस प्रोजेक्ट के लिए विकास एजेंसी है, जबकि BDL इसके लिए उत्पादन एजेंसी है.

इस प्रोग्राम को भारतीय वायु सेना और भारतीय नौसेना के लिए रक्षा अधिग्रहण परिषद द्वारा मंजूरी दी गई थी, जिसके तहत 2022-23 में दोनों सर्विसेज के लिए 248 मिसाइलों का उत्पादन किया जाना था.

हवा से हवा में मार करने वाली मिसाइलों की एस्ट्रा सीरीज एस्ट्रा प्रोग्राम का हिस्सा है, जिसका मकसद भारतीय सशस्त्र बलों की हवाई युद्ध क्षमताओं को बढ़ाना है. एस्ट्रा मार्क 1 मिसाइल, मार्क 2 की पूर्ववर्ती है, जिसे पहले ही भारतीय वायु सेना और नौसेना दोनों में सफलतापूर्वक शामिल किया जा चुका है.

DRDO बना रहा स्पेशल मोटर

सीनियर रक्षा अधिकारियों ने इंडिया टुडे को बताया कि मौजूदा में एस्ट्रा मार्क 2 मिसाइलों पर काम चल रहा है और 130 किलोमीटर की मारक क्षमता वाली इस मिसाइल का पहला टेस्ट आने वाले महीनों में होने वाला है.

मिसाइल की रेंज बढ़ाने के लिए डीआरडीओ एक स्पेशल मोटर विकसित करने पर विचार कर रहा है. मौजूदा एस्ट्रा मार्क 1 मिसाइल की रेंज 100 किलोमीटर तक है, जिसे और भी बढ़ाया जा सकता है.

देश से ही हवा से हवा में मार करने वाला मिसाइल सिस्टम विकसित करने का सफर 2001 में शुरू हुआ, जब डीआरडीओ ने तमाम स्टेकहोल्डर्स के साथ चर्चा शुरू की. इसका मकसद विजुअल रेंज से परे दुश्मन के टार्गेट्स को भेदने में सक्षम मिसाइल सिस्टम को डिजाइन और विकसित करना था.

इसके बाद हैदराबाद की रक्षा अनुसंधान और विकास प्रयोगशाला (DRDL) को इस प्रोजेक्ट के लिए नोडल लैब के रूप में पहचाना गया. शुरुआती स्टडीज करने और प्रोजेक्ट को आगे बढ़ाने के लिए एक समर्पित टास्क फोर्स का गठन किया गया.

https://www.aajtak.in/india/news/story/bdl-gets-clearance-for-producing-200-made-in-india-astra-missiles-by-iaf-ntc-2000691-2024-08-05

THE ECONOMIC TIMES

Sun, 04 Aug 2024

IAF gives clearance to DRDO, BDL for Astra missile production

In a boost to indigenous missile manufacturing capabilities, the Indian Air Force has given clearance to public sector firm Bharat Dynamics Limited for the production of 200 Astra Mark 1 air-to-air missiles.

The Astra Mark1 missiles have been developed by the Defence Research and Development Organisation with BDL as its production agency. The production clearance to the BDL was given during a visit by the Indian Air Force Deputy Chief Air Marshal Ashutosh Dixit to Hyderabad recently, Indian Air Force officials said.

"The IAF Deputy Chief had visited the DRDO's Defence Research and Development Laboratory which is the development agency for the Astra missiles," they said.

"The approval for the over Rs 2,900 crore project was granted in 2022-23 by the Defence Acquisition Council and the production clearance has been given for that order now after completion of all tests and developments," defence sources said.

The Defence Research and Development Laboratory (DRDL) is the nodal lab for this project. The Astra missiles will be integrated on both the Russian-origin Su-30 as well as the indigenous LCA Tejas fighter aircraft after production.

The Indian Air Force is helping a lot of indigenous projects for missiles and three to four such programmes are nearing completion including air-toground missiles.

The Astra programme is being progressed gradually by the DRDO and IAF and they are now looking at testing the Mark 2 of the weapon system at around 130 Kms.

The plans are also afoot to test and develop a long-range Astra with a strike capability of 300 Kms.

https://economictimes.indiatimes.com/news/defence/iaf-gives-clearance-to-drdo-bdl-for-astra-missile-production/articleshow/112269092.cms

Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Fri, 02 Aug 2024

Indian Naval Ship Tabar Conducts Maritime Partnership Exercise (MPX) With Russian Naval Ship Soobrazitelny

Indian Navy's frontline frigate, INS Tabar arrived St. Petersburg, Russia on 25 Jul 24 for a four day visit to participate in 328th Russian Navy Day Parade celebrations. India and Russia share warm bilateral relations and maritime co-operation that span diverse fields. The visit by INS Tabar aimed to strengthen this longstanding friendship and also explore newer avenues of bolstering the relationship between the two countries.

INS Tabar, on departure from St. Petersburg, Russia successfully conducted Maritime Partnership Exercise (MPX) with the Russian Navy Ship Soobrazitelny on 30 Jul 2024. Participation of Indian Navy Ship Tabar in the 328th Russian Navy Day Parade and conduct of MPX marks a significant milestone in the maritime cooperation between India and Russia, reinforcing the commitment of both nations to maintain peace, stability and security in the region. The MPX involved a series of complex naval manoeuvers, including communication drills, Search & Rescue tactics and Replenishment at Sea serials. Ships from both navies demonstrated high levels of professionalism and interoperability.

The Indian Navy remains committed to fostering partnerships with navies across the world. The MPX with the Russian Navy reinforces the strong bilateral naval ties, further strengthening our resolve and commitment towards ensuring enhanced cooperation in the maritime domain.

https://pib.gov.in/PressReleasePage.aspx?PRID=2040892

Press Information Bureau
Government of India

Ministry of Defence

Fri, 02 Aug 2024

Technology Development Fund Scheme

The steps taken by the Defence Research and Development Organisation (DRDO) towards the goal of Self-reliance through Technology Development Fund scheme are:

- TDF scheme aligns perfectly with the vision of 'Aatmanirbhar Bharat' by bringing new industries especially Startups & MSMEs in the fold of design and manufacturing of defence technology. Funding of upto Rs. 50 Cr is provided to the industry as grant.
- A total of 78 projects under TDF scheme at a cost of Rs. 333.21 Cr approx. has been sanctioned.
- So far, 27 technologies under 10 projects have been successfully developed under TDF scheme.

The details of the projects sanctioned under the TDF scheme during the current year (January 01, 2024 to June 30, 2024) are given below:

S No	**Name of the Project**	**Name of DA**	**Industry Status MSME/ Large/Startup (DA)**	**Industry Type (DA)**
1.	IRNSS based Timing Acquisition and Dissemination System	M/s Acord Software & System Pvt. Ltd., Bangalore	Large	Pvt. Ltd.
2.	Underwater Launched Unmanned Aerial System	M/s Sagar Defence Engg. Pvt. Ltd., Pune	Start-up	Pvt. Ltd.

3.	Development of Indigenous Scenario & Sensor Simulation Toolkit	M/s Oxygen 2 Innovation Pvt. Ltd., Noida	Start-up	Pvt. Ltd.
4.	Development of ICE Detection Sensor	M/s Craftlogic Labs Pvt. Ltd., Bangalore	MSME	Pvt. Ltd.
5.	Long Range ROV for UW object detection and neutralization	M/s IROV Technologies Pvt. Ltd., Kochi	Start-up	Pvt. Ltd.
6.	Development of Graphene Based Smart and E-Textiles for Multifunctional wearable application as EXP	M/s Aloha Tech Ventures Pvt. Ltd., Coimbatore	Start-up	Pvt. Ltd.
7.	75 KVA Constant Frequency Alternators EXP	M/s VEM Technologies Pvt. Ltd., Hyderabad	MSME	Pvt. Ltd.
8.	Radar Signal Processor with Active Antenna Array Simulator	M/s Data Patterns (India) Limited, Chennai	Large	Limited

This information was given by Raksha Rajya Mantri Shri Sanjay Seth in a written reply to Shri Vijay Baghel and others in the Lok Sabha today.

https://pib.gov.in/PressReleasePage.aspx?PRID=2040792

Press Information Bureau
Government of India

Ministry of Defence

Fri, 02 Aug 2024

14th India-Vietnam Defence Policy Dialogue held in New Delhi

The 14th India-Vietnam Defence Policy Dialogue took place in New Delhi on August 01, 2024. It was co-chaired by Defence Secretary Shri Giridhar Aramane and Deputy Minister of National Defence of Vietnam Senior Lieutenant General Hoang Xuan Chien.

During the meeting, the two sides reviewed the range of bilateral defence cooperation issues and noted the transformative progress in the ties after the signing of 'Joint Vision Statement on India-Vietnam Defence Partnership towards 2030' in June 2022 during the visit of Raksha Mantri Shri Rajnath Singh to Vietnam.

Vietnam proposed five focus areas for cooperation which included delegation exchanges and dialogue, staff-talks; Service-to-Service cooperation; Education and training; and Defence Industry cooperation. The Defence Secretary welcomed the five point proposal and proposed cooperation in emerging areas of concern for both countries like Cyber Security, Information Security, Military Medicine, Submarine Search & Rescue.

The Defence Secretary highlighted the potential of domestic defence industry to fulfill capacity and capability enhancement of Friendly Foreign Countries, and looked forward to fruitful partnership with Vietnam People's Armed Forces, and their industries. After the meeting, the Defence Secretary and the Deputy Minister of National Defence of Vietnam signed a Letter of Intent to strengthen cooperation in the field of training including exchange of instructors and experts.

Defence cooperation is one of the strong pillars of Comprehensive Strategic Partnership between India and Vietnam. Vietnam is an important partner in India's Act East Policy and in the Indo-Pacific Region.

https://pib.gov.in/PressReleasePage.aspx?PRID=2040680

Press Information Bureau
Government of India

Ministry of Defence

Sat, 03 Aug 2024

Visit Of INS Shalki To Colombo

Indian Navy's submarine INS Shalki, is in Colombo, Sri Lanka on a two day visit. The submarine was accorded a ceremonial reception by the Sri Lanka Navy on 02 Aug 24.

During the visit, the Commanding Officer is scheduled to call on the Commander of the Western Naval Area Rear Admiral WDCU Kumarasinghe, followed by visit and briefing of Sri Lanka Navy personnel onboard. Personnel from High Commission of India in Sri Lanka and Sri Lanka Defence Forces are also scheduled to visit the submarine.

INS Shalki is a Shishumar class diesel-electric submarine, commissioned into the Indian Navy on 07 Feb 1992. This is the first ever submarine to be built in India.

Earlier, Kalvari class submarines INS Karanj and INS Vagir had visited Colombo in Feb 2024 and Jun 2023 (to celebrate International Day of Yoga).

https://pib.gov.in/PressReleasePage.aspx?PRID=2041161

Press Information Bureau
Government of India

Ministry of Defence

Sun, 04 Aug 2024

CDS Gen Anil Chauhan to chair apex conference on financial synergy and cohesion in Armed Forces on Aug 5

Chief of Defence Staff Gen Anil Chauhan is scheduled to chair an apex level tri-service financial conference on 05 Aug 24 at Manekshaw Centre, New Delhi.

The conference is aimed to enhance cohesion and synergy in financial issues of the Armed Forces and will see the participation of senior officials from MoD, MoD (Fin), Controller General Defence Accounts, Integrated Financial Advisers of Services, Government e-Marketplace, Service Headquarters, and Indian Coast Guard Headquarters. The CDS will also deliver the keynote address.

The conference, aligned with the objectives set for the ongoing drive on integration and jointness in the Armed Forces, is being coordinated by HQ IDS to enhance cooperation and have greater synergy on financial issues.

Discussions are scheduled on aspects of Understanding the Perspectives of various stakeholders in Defence Finance and Finding Solutions to challenges faced in defence procurements. The Financial Advisor (Defence Services) and Director General (Acquisitions) will also give specific talks on the roles and actions undertaken by their organisations in expeditious procurement.

This apex level conference brings all stakeholders MoD, MoD (Fin), HQIDS, SHQs, Coast Guard and CGDA on one platform.

https://pib.gov.in/PressReleasePage.aspx?PRID=2041274

THE ECONOMIC TIMES

Sat, 03 Aug 2024

Indian submarine INS Shalki visits Sri Lanka

Indian submarine INS Shalki is on a two-day visit to Sri Lanka in reflection of growing maritime security cooperation between the two countries.

The Shishumar class diesel-electric submarine arrived in Colombo on August 2, the Indian Navy said on Saturday. India sends submarines to a handful of countries with whom it has close defence and strategic ties.

The Indian submarine's visit to Colombo comes against the backdrop of China's persistent attempts to enhance its strategic and military influence over the island nation.

The submarine was accorded a ceremonial reception by the Sri Lanka Navy on its arrival on Friday. INS Shalki was commissioned into the Indian Navy on February 7, 1992. It is the first ever submarine to be built in India.

Earlier, Kalvari class submarines INS Karanj and INS Vagir had visited Colombo in February this year and June last year. The Commander of the submarine was scheduled to call on the Commander of the Western Naval Area Rear Admiral WDCU Kumarasinghe, the Indian Navy said in a statement.

Personnel from High Commission of India and Sri Lankan defence forces personnel are also scheduled to visit the submarine, it said. India has been expanding its overall defence and strategic ties with Sri Lanka amid concerns over China's attempts to increase its military presence in the Indian Ocean.

The docking of the Chinese missile and satellite tracking ship 'Yuan Wang' at Hambantota port in August 2022 had triggered a diplomatic row between India and Sri Lanka. Another Chinese warship docked at the Colombo port in August last year.

India has been supporting various capacity building measures of Sri Lankan defence forces including providing indigenously constructed Offshore Patrol Vessels.

https://economictimes.indiatimes.com/news/defence/indian-submarine-ins-shalki-visits-sri-lanka/articleshow/112249234.cms

TIMESNOW

Sat, 03 Aug 2024

From France to Noida: DAMROI's New Hub A GameChanger for IAF Mirage-2000 and Rafale Maintenance

This isn't "Make in India," but it is equally importantly, "Maintain in India." And the immediate beneficiary will be the Indian Air Force (IAF). DAMROI or Dassault Maintenance and Repair

Organisation, India, will be opening their facilities in Noida, Uttar Pradesh, and the IAF's Mirage-2000 and Rafale fighters can be serviced there.

This will ensure that the "turnaround" is quicker and less expensive. Currently, the IAF has about 50 Mirage-2000 fighters, purchased in the 1980s and two squadrons of 36 Rafales, acquired recently.

There is also the possibility of buying more Rafales-- it is one of the fighters being considered, the IAF needing more than 110 in the future. The French have been supportive in the past, notably when India faced sanctions from many countries after the nuclear explosions in 1998, and DAMROI will ensure a lot of help for the IAF.

It will be a huge investment and comes after the defence ministry's initiative in the recent changing of Foreign Direct Investment rules.

As a senior government official said: "This is the first time an international organisation is setting up an MRO. It is a huge investment and hopefully, others will follow. For us, it will be quicker...sending them to Noida and getting them back."

This, the first step, is likely to lead to further benefits.

In future, DAMROI could bring across machinery to Noida to manufacture spares for the fighters ensuring a sense of security, particularly during stressful periods. Besides, friendly countries that have the Mirage-2000 and the Rafale could get their planes serviced in Noida as opposed to sending them to France.

These include countries like Greece, Egypt and Qatar, all of which have the Rafale. Again, India has spoken of Make for the World. This, however, will be "Maintain for the world." Also, other major aviation sector manufacturers could be encouraged to set up MROs in India, now that there is a precedent.

The DAMROI initiative should lead to the growth of an industrial ecosystem around it. It is likely to mean additional employment in the aviation and related sectors. The all-important announcement is likely soon. Get Latest News Live on Times Now along with Breaking News and Top Headlines from India and around the world.

https://www.timesnownews.com/india/from-france-to-noida-damrois-new-hub-a-game-changer-for-iaf-mirage-2000-and-rafale-maintenance-article-112243712

नवभारत टाइम्स

Sat, 03 Aug 2024

पाकिस्तान को मिली आखिरी 'आसमानी आंख', भारत कोसों पीछे, इतना जरूरी क्यों है **AWACS?**

स्वीडिश कंपनी साब ने पाकिस्तान को ऑर्डर किए गए साब 2000 एरीये एयरबोर्न अर्ली वार्निंग एंड कंट्रोल एयरक्राफ्ट में से आखिरी विमान सौंप दिया है। ऑर्डर किए गए साब 2000 एरीये विमानों में से आखिरी विमान 2 जुलाई, 2024 को मिन्हास एयर बेस पर पाकिस्तान को डिलीवर किया गया, जो इन विमानों के बेड़े का होम बेस है। इस डिलीवरी के

साथ, पाकिस्तान वायु सेना के पास अब इस प्रकार के नौ विमान हैं, जो भारत के साथ सीमा पर गश्त करने में सक्रिय रूप से शामिल हैं। अंतिम वितरित विमान को तीसरे एयरबोर्न अर्ली वार्निंग स्क्वाड्रन में तैनात किया जाएगा, जो यूनिट को एयर बेस पर तैनात लड़ाकू विमानों के साथ समन्वय करने में भी मदद करेगा।

पाकिस्तान ने कब दिया था ऑर्डर

पाकिस्तान ने स्वीडिश कंपनी साब के साथ 2006 में साब एयरबोर्न अर्ली वार्निंग एयरक्राफ्ट की खरीद के लिए एक अनुबंध पर हस्ताक्षर किए थे। उस समय, पाकिस्तान ने छह साब 2000 एरीये विमानों का ऑर्डर दिया था, लेकिन आर्थिक कठिनाइयों के कारण, ऑर्डर को घटाकर चार यूनिट कर दिया गया था। 2017 और 2020 में, देश ने हर साल तीन विमानों का ऑर्डर दिया। अब पाकिस्तानी रक्षा मंत्रालय ने बताया है कि वह एक अतिरिक्त ऑर्डर देना चाहता है।

भारत के खिलाफ बड़ी तैयारी में पाकिस्तान

भारत के साथ बिगड़ते संबंधों के कारण, पाकिस्तानी सरकार आधुनिक लड़ाकू विमानों सहित नवीनतम हथियारों की खरीद के लिए बड़े ऑर्डर दे रही है। मिलिटर्नी की रिपोर्ट के अनुसार, पाकिस्तानी पायलटों ने चीनी पांचवीं पीढ़ी के जे-31 लड़ाकू विमानों पर प्रशिक्षण शुरू कर दिया है। नए विमान संभावित रूप से पाकिस्तान की वायु सेना की क्षमताओं को बढ़ाएंगे और देश को संयुक्त विमानन परियोजनाओं पर अधिक निकटता से सहयोग करने की अनुमति देंगे।

भारत के पास कितने अवाक्स

भारतीय वायु सेना तीन रूसी IL-76 'फाल्कन' अवाक्स और दो इंबरर नेत्र अर्ली वॉर्निंग एयरक्राफ्ट को संचालित करती है। इनमें से अधिकतर अवाक्स का संचालन चीन और पाकिस्तान की सीमा पर किया जाता है। अगर कोई अवाक्स मेंटीनेंस के लिए जाता है तो इसकी संख्या और ज्यादा कम हो जाती है। इससे भारत की आसमान से दुश्मन पर नजर रखने की क्षमता भी प्रभावित होती है। अवाक्स सिस्टम दुश्मन के क्षेत्र में अंदर तक जानकारी जुटाने के लिए लंबी दूरी के रडार से लैस होता है। यह दुश्मन की हर एक हवाई गतिविधि के बारे में अग्रिम जानकारी प्रदान करके युद्ध के समय महत्वपूर्ण भूमिका निभा सकता है।

अवाक्स सिस्टम जरूरी क्यों

अवाक्स प्लेटफॉर्म शक्तिशाली ग्राउंड बेस्ड रडार की सीमित क्षमताओं के पार जाकर जानकारी जुटाते हैं। अवाक्स गतिशील होते हैं और विभिन्न ऊंचाइयों पर उड़ सकते हैं। इससे उन्हें कम ऊंचाई पर उड़ने वाली मिसाइलों, विमानों या पृथ्वी की वक्रता के कारण जमीन पर मौजूद रडार की दृष्टि में न आने वाले वस्तुओं की पहचान भी कर पाते हैं। अवाक्स एक व्यापक मोर्चे को कवर कर सकता है, जिससे यह जमीन पर मौजूद रडार और सतह से हवा में मार करने वाली मिसाइलों के साथ समन्वय करके एक गहन नेटवर्क वाली एकीकृत वायु रक्षा (आईएडी) बना सकते हैं। यह दुश्मन के हवाई क्षेत्र पर भी नजर रख सकते हैं।

https://navbharattimes.indiatimes.com/world/pakistan/saab-delivers-last-saab-2000-erieye-awacs-aircraft-to-pakistan-indian-air-force-early-warning-system/articleshow/112249359.cms

नवभारत टाइम्स

Sat, 03 Aug 2024

एक सेंकड, तीन राउंड फायर और दुश्मन का सफाया... भारतीय सेना को मिलने वाली है **100** एडवांस 'वज्र' तोपें

भारत अपनी सैन्य ताकत को और भी मजबूत करने जा रहा है। मीडिया रिपोर्ट्स के मुताबिक सरकार ने सेना को आधुनिक बनाने के लिए 100 और K9 वज्र-टी तोपें खरीदने का फैसला किया है। ये तोपें स्वदेशी कंपनी लार्सन एंड

टुब्रो (L&T) बनाएगी। यह कदम भारत की सैन्य क्षमता को और भी मजबूत करेगा। इससे खासकर ऊंचाई वाले इलाकों में भारत की ताकत और बढ़ जाएगी।

चीन का सामना करने में मिलेगी मदद

इससे पहले भी भारत ने 100 K9 तोपें खरीदी थीं, जिन्हें रेगिस्तानी इलाकों में तैनात किया गया था। अब इन्हें चीन से सटे एलएसी के पास पहाड़ी इलाकों में तैनात करने के लिए ढाला जा रहा है। चीन के साथ बढ़ते तनाव के मद्देनजर भारत अपनी सैन्य रणनीति और साजो-सामान को मजबूत बनाने में जुटा है।

भारत में ही हुआ है निर्माण

K-9 वज्र असल में दक्षिण कोरियाई K9 थंडर 155mm तोप का भारतीय संस्करण है, जिसका निर्माण L&T कंपनी भारत में लाइसेंस के तहत करती है। भारतीय संस्करण में स्वदेशी तकनीक का इस्तेमाल किया गया है, जिसमें फायर कंट्रोल सिस्टम, डायरेक्ट फायर सिस्टम और गोला-बारूद प्रबंधन प्रणाली शामिल हैं। ये सभी L&T द्वारा ही विकसित और निर्मित किए गए हैं।

बेहद खास है ये तोप

K9 वज्र-टी तोपों को खास तौर पर कठिन परिस्थितियों में काम करने के लिए डिजाइन किया गया है। इन्हें -20°C तक के तापमान में भी काम करने लायक बनाने के लिए विंटर किट से लैस किया गया है। इन किट में खास बैटरी और लुब्रिकेंट शामिल हैं जो पहाड़ी इलाकों की भीषण ठंड में भी काम कर सकते हैं। K9 प्रोजेक्ट की सबसे खास बात यह है कि इसमें 80% से ज्यादा काम भारत में ही हुआ है। L&T के मुताबिक, वज्र-टी सिस्टम के आधे से ज्यादा पुर्जे भारत में ही बने हैं।

पलभर में दुश्मन का सफाया करने में सक्षम

K9 वज्र-टी अपनी मारक क्षमता के लिए जाना जाता है। इसमें 155mm की तोप लगी है जो 38 किलोमीटर तक निशाना लगा सकती है। तेजी से फायर करने की क्षमता, सेमी-ऑटोमेटिक लोडिंग सिस्टम और बैलिस्टिक खतरों और एंटी-पर्सनल माइंस के खिलाफ मजबूती इसे भारतीय सेना के लिए एक महत्वपूर्ण हथियार बनाती है। अपनी मारक क्षमता के अलावा, K9 वज्र अत्याधुनिक डिजिटल फायर कंट्रोल सिस्टम से लैस है और यह मल्टीपल राउंड सिमुल्टेनियस इम्पैक्ट (MRSI) जैसे जटिल मोड में भी काम कर सकता है, जिससे युद्ध के मैदान में इसकी प्रभावशीलता और बढ़ जाती है।

हर सेकंड में कर सकती है तीन राउंड फायर

K-9 वज्र में 155mm/52 कैलिबर की तोप लगी है जो हर 15 सेकंड में तीन राउंड फायर कर सकती है। यह 3 मिनट तक 6 से 8 राउंड प्रति मिनट की अधिकतम गति से फायर कर सकती है। HE (हाई एक्सप्लोसिव) प्रोजेक्टाइल के साथ, इसकी अधिकतम फायरिंग रेंज 30 किमी है लेकिन यह 40 किमी की अधिकतम फायरिंग रेंज तक पहुंचने के लिए K307 बेस ब्लीड HE गोला बारूद भी फायर कर सकता है। इसमें पांच लोगों का दल होता है जिसमें एक ड्राइवर, कमांडर, गनर और दो लोडर शामिल हैं।

https://navbharattimes.indiatimes.com/india/indian-army-is-going-to-get-100-advanced-k9-vajra-cannons/articleshow/112242686.cms

THE ECONOMIC TIMES

Sat, 03 Aug 2024

Despite engine delays, production of indigenous LCA jets on

Despite delays in the deliveries of jet engines, India is marching on with the production of indigenous light combat aircraft (LCA) to meet requirements of the air force, with 14 airframes and integrated systems expected to be completed in the current financial year.

The latest version of the aircraft-LCA Mk1A-is currently undergoing extensive flight tests and the first fighter is likely to be delivered within two months. The air force has ordered 83 of these aircraft. While airframes are being manufactured and all other systems integrated on production aircraft, the delay in supply of GE 404 engines by the US manufacturer has led to a lag in delivery. The first LCA Mk1A was scheduled to be handed over in July.

Sources said GE, which is facing supply chain issues in manufacturing the engines as some suppliers closed production due to Covid-related complications, is expected to start supplies by October this year.

It is learnt that manufacturer Hindustan Aeronautics Limited (HAL), which had been mandated to deliver 16 aircraft this financial year, has devised a plan in which the manufacturing of air frames and integration of all other systems will go on, with the engines to be fitted at a later stage when GE manages to streamline supplies.

As per projections, at least 14 air frames in a ready-to-go state should be available within the financial year. For now, the aircraft maker will keep manufacturing the aircraft and completing all tests with standby engines that it has in inventory. Once the engine supplies start coming, they will be integrated on the completed airframes-a process that can take a few weeks-before being handed over to the air force.

Two production lines for the LCA Mk1A are currently active in Bengaluru while a third at Nashik is likely to be operational by October. The first aircraft from the Nashik line is expected to be ready this financial year as well.

Each of the lines can make eight aircraft per year. Even with the engine delays, the delivery of all 83 jets on order is expected to be completed within the 2028 deadline. Sources said that at present, the first LCA Mk1A aircraft is undergoing flight tests and will shortly demonstrate firing of indigenous weapons such as the Astra beyond visual range (BVR) air-to-air missile.

The second production aircraft is undergoing ground trials while four more are in an advanced stage of manufacturing. India is already in talks with GE for significantly increasing the order for its GE 404 engines that will be required for an additional order of 97 LCA Mk1A aircraft that has been approved by the government. The approach is to place orders well in time to avoid any delays in deliveries.

https://economictimes.indiatimes.com/news/defence/despite-engine-delays-production-of-indigenous-lca-jets-on/articleshow/112252308.cms

ANI
South Asia's Leading Multimedia News Agency

Sun, 04 Aug 2024

IAF Deputy Chief inaugurates Solar Industries' Chaff manufacturing plant in Nagpur

: In a boost to the Make in India initiative, Indian Air Force Deputy Chief Air Marshal Ashutosh Dixit, inaugurated Chaff Plant at Economic Explosives Limited (EEL), Nagpur on July 31, Solar Industries said in a release.

EEL is a 100 per cent subsidiary of Solar Industries India Limited. Chaff is one of the most widely used and effective expendable electronic countermeasure device. It is dispensed into the atmosphere to deny radar acquisition, generate false targets and disrupt tracking by enemy radar.

Solar has set up the first fully indigenous state-of-the art production plant at Nagpur. Until now, the country had been fully dependent on import. Chaff 118, Chaff 50mm and Chaff 26mm, along with impulse cartridges manufactured at this most advanced facility of Solar Group, are used in different aircrafts such as Jaguar D-II, D-III, MIG29, Mirage 2000, Bison, LCA, Apache, Chinook, Embraer, AWACS, Cth/Ctk, AHWSI, LCH, etc.

The Chaff payloads were developed by EEL with Technology Support from Defence Laboratory, Jodhpur, under the category of Buy Indian-IDDM (Indigenously Designed, Developed and Manufactured).

EEL has got airworthiness certificate from the Air Force Inspecting Authorities for the Chaff payloads manufactured in-house, thus paving the way for fitment on aircraft, helicoptersand other airborne platforms. Keeping in view the huge requirement of Chaffs by Armed Forces, EEL is augmenting its manufacturing capacity, which will be completed in another six months. This is a first modern and advanced technology in the country.

https://www.aninews.in/news/national/general-news/iaf-deputy-chief-inaugurates-solar-industries-chaff-manufacturing-plant-in-nagpur20240804141819/

THE ECONOMIC TIMES

Mon, 05 Aug 2024

French Air and Space Force to take part in Tarang Shakti exercise in Tamil Nadu

A contingent from the French Air and Space Force will participate in India's first multilateral air exercise, Tarang Shakti-2024, which is set to begin at Air Force Station Sulur in Tamil Nadu on August 6.

The French contingent will comprise three Rafale fighter jets, one Multirole Tanker Transport (MRTT) aircraft, and one A400M, with a total of 160 Air Force personnel, according to French Embassy in India press release.

In the press release, the French Embassy in India stated, "Three other nations are participating in the first phase of this exercise, including EU Member States Germany and Spain, which have been partners of the Pacific Skies deployment from Alaska to India.

The French contingent's participation forms part of its two-month long mission across the Indo-Pacific region, which started in France at the end of June and will conclude on August 15, according to the French Embassy in India press release.

The French Embassy in India further stated, "The mission's goals are to demonstrate France's ability to protect its sovereignty as a resident nation of the Indo-Pacific with several territories in the region, promote the rule of law and multilateralism in this zone, and enhance interoperability with key partners like India. By the end of its mission, the PEGASE 24 will have made stopovers in 13 partner nations and taken part in three major exercises throughout this period, including Tarang Shakti."

The French Ambassador to India, Thierry Mathou, called India a "trusted strategic partner" for France and said that France is proud to participate in India's first multilateral air exercise.

Mathou said, "As India's trusted strategic partner, France is proud to participate in India's first-ever multilateral air exercise and contribute to making it a success. Our contingent joins India as part of an extended deployment in the Indo-Pacific, which reflects France's commitment as a resident power of the region."

"I also wish to highlight the European dimension of Tarang Shakti with EU Member States Germany and Spain participating, too. France is a strong supporter of Europe's role as an active stakeholder of security and stability in the Indo-Pacific," he added.

To mark the conclusion to Tarang Shakti and France's PEGASE 24 deployment, France's Chief of Air Staff, General Stephane Mille, will arrive in India for an official visit from August 12-14. General Mille will attend the closing ceremony of the exercise at AFS Sulur, meet his counterpart and key officials in Delhi, and speak at the National Defence College.

The French Embassy in India stated, "Military cooperation between France and India has been particularly intense since the beginning of 2024. A major joint army exercise, SHAKTI, took place in Meghalaya in May, the French Navy took part in the 'Milan' multinational exercise in February in the Bay of Bengal, and the first-ever India-France-UAE air trilateral exercise was held in January off the coast of Mumbai."

"CDS General Anil Chauhan made his first official visit to France in April, while the French chiefs of Army Staff and Naval Staff visited India. The French and Indian navies, too, are gearing up for their bilateral VARUNA drills, slated later in the year," it added.

The armed forces of France and India maintain an intense schedule of exercises that go back decades and illustrate the trust underpinning the France-India strategic partnership.

These include the VARUNA Navy exercises (dating back to 1983), GARUDA Air exercises, and SHAKTI Army exercises. France and India have also participated in each other's multilateral exercises, like the France-led La Perouse naval drill in 2022 and the ORION megaexercise in 2023.

In January this year, French President Emmanuel Macron and Prime Minister Narendra Modi "expressed satisfaction with the increasing complexity and interoperability of India-France joint defence exercises across air, sea and land and agreed to consider a distinct joint tri-services exercise."

https://economictimes.indiatimes.com/news/defence/french-air-and-space-force-to-take-part-in-tarang-shakti-exercise-in-tamil-nadu/articleshow/112278116.cms

The Tribune

Mon, 03 Aug 2024

Capital outlays at the core of defence capabilities

-By Lt Gen Pradeep Bali (retd)
(Military Commentator)

This calendar year has seen the tabling of two Budgets — the interim one on February 1 and the full one for 2024-25 on July 23. The allocations for the defence sector have not seen any major variation, belying hopes that Modi 3.0 would focus more on capability enhancement of the armed forces. The defence expenditure as a share of the total expenditure has declined from 17.8 per cent in 2016-17 to 13.9 per cent in 2023-24 (revised estimates) and 12.9 per cent for the current fiscal. Overall spending for FY 2024-25 has increased only by 4.8 per cent over FY 2023-24. Adherence to fiscal strictness in government expenditure may partially explain why the Modi government has kept the increase in defence expenditure minimal.

The Ministry of Defence (MoD) has a total allocation of Rs 6,21,941 crore. Within this kitty, 27.7 per cent is for planned capital acquisitions, aimed at equipping the armed forces with advanced technology and weaponry, 14.8 per cent for revenue expenditure, 53.3 per cent for salaries and pensions, and 4.2 per cent for civil organisations under the MoD. To boost indigenous defence production, Rs 1,05,518 crore has been allocated for domestic capital procurement out of the total capital head.

The continuing inimical activities by our northern and western neighbours, the need to ensure maritime security, and having the ability to deter the enemy on land, in the sea and the air, are inescapable realities that narrow down our options. A robust financial outlay for defence is thus imperative for any FM. However, a cursory look at the outlays indicates a largely status quoist approach. Factoring in inflation makes percentage increases largely cosmetic and just about adequate to meet immediate needs. Any attempted dexterity in spending is hemmed in by committed liabilities consuming the larger part of capital outlays.

Though the defence expenditure is the largest component of the Union Budget, one sees little result-oriented discussion and informed debates on it. Even the well-thought-out recommendations

of the Standing Committee for Defence remain bereft of action. A long-standing recommendation, which had also been projected by the 15th Finance Commission, was the creation of a non-lapsable modernisation fund for defence and internal security. However, this has not matured into a working mechanism. The security situation in the neighbourhood as well as globally remains unpredictable. We, however, have been mostly reactive in dealing with any crisis to the extent that even funding is met in an emergency mode.

Building capacities and developing capabilities need time, while intentions can change rapidly. Cost-intensive infusion of high-end technology in military systems and equipment, which in the present day also includes cyberspace, space and unmanned platforms, has to be ongoing. While planning for our defence, we need to clearly understand that capital outlays are the foundation of capabilities.

The ‘capital good, revenue bad’ analysis is a regular part of discussions on the defence budget. This is more of a slogan than a cogent analysis. The revenue head includes expenditures on sustenance, operational preparedness, continuing procurement and maintenance of in-service equipment. The situation we face in J&K and on the borders with China and Pakistan makes a manpower-intensive posture imperative and inevitable. Salaries and pensions are a function of the size of the forces needed to be maintained, based not only on operational needs but also on the methods of application in such a scenario. The cost of the human resource required for this is as necessary as any weapon platform. The ‘capital versus revenue’ argument is not of much consequence outside of account books. It also needs no reiteration that defence pensions are a sovereign promise to the soldier and his family for his service to the nation.

As much as 75 per cent of the outlay for modernisation will be spent on sourcing from the domestic industry, in line with the focus on Aatmanirbharta, and Rs 43,000 crore will be spent on imports dedicated to capital acquisitions. The lead times necessary to develop, produce and deploy critical technologies and weapon systems are considerable. Boosting indigenous production of defence equipment has to be an important pillar of our defence policy, but this will be a long, ongoing process and cannot meet current requirements in an optimal manner. Then again, our indigenisation efforts must be freed from stifling procedures.

There has to be a concerted effort for encouraging startups and private players in defence production by an underwritten assurance of confirmed orders for viable products within a clear timeline, failing which the project could be foreclosed.

Unlike in the past, the current defence budget does not spell out distribution of capital expenditure among the three services, on the grounds of fostering jointness. This obstructs the estimation of service-wise share. This also leads to an issue of concern from the past — the lapsing of the capital budget of the Army. While the Navy and the Air Force are platform-centric in their capital inventory, with big budget systems, the Army has a huge inventory of small and medium-level weapons and equipment. The fault lies primarily in procedural delays, overshooting trial timelines and contractual issues, most of which are beyond the control of the Army HQ directorates dealing with procurement. The acquisition vertical of the MoD should be fully accountable for this and reasons need to be ascertained for missing the expenditure targets.

The defence budget must be capability-driven and not intention-driven. A firm step in this direction would be to make the capital budget ‘non-lapsable’ and ‘roll-on’ in nature, with a five-year time

span. A non-lapsable military modernisation fund must be created and a Defence Commission constituted to ensure that this is utilised optimally by being the bridge between Service HQs and the Cabinet Committee on Security. A draft Cabinet note for such a fund has been under consideration by the government for quite some time now and needs to be approved expeditiously. Any nation keen to raise the quality of life of its citizens requires serious efforts and substantial resources. India, too, is engaged in this journey towards development. We must never forget, however, that the sine qua non of Viksit Bharat is Surakshit Bharat.

https://www.tribuneindia.com/news/comment/capital-outlays-at-the-core-of-defence-capabilities/#:~:text=Within%20this%20kitty%2C%2027.7%20per,civil%20organisations%20under%20the%20MoD.

THE ECONOMIC TIMES

Mon, 05 Aug 2024

US says military moves in Middle East aimed at de-escalating tensions

The U.S. is deploying additional military might in the Middle East as a defensive measure with a goal of deescalating tensions in the region, a White House official said on Sunday.

Regional tensions have increased following the assassination on Wednesday of Ismail Haniyeh, the leader of the Palestinian Islamist group Hamas, in Tehran a day after an Israeli strike in Beirut killed Fuad Shukr, a senior military commander from the Lebanese group Hezbollah. Both groups are backed by Iran.

There are mounting fears that Israel's war against Palestinian militants in Gaza, which began last October after attacks on the Jewish state, could escalate into a wider Middle East conflict. Iran and Hamas have blamed Israel for Haniyeh's killing in the Iranian capital, and they, together with Hezbollah, have vowed revenge. Israel has not claimed or denied responsibility.

U.S. President Joe Biden will convene his national security team in the situation room on Monday to discuss developments in the Middle East, the White House said, adding that he would speak with Jordan's King Abdullah as well.

U.S. news service Axios reported that U.S. Secretary of State Antony Blinken told his counterpart from G7 countries that Iran and Hezbollah could start attacking Israel as early as Monday, citing three sources briefed on the call.

But Blinken, according to Axios, said it was unclear how Iran and Hezbollah would attack and did not know the exact timing. When asked about the report, the State Department referred to a readout of the call, where it said the ministers discussed "the urgent need for deescalation in the Middle East."

The Pentagon said on Friday it would deploy additional fighter jets and Navy warships to the region.

"The overall goal is to turn the temperature down in the region, deter and defend against those attacks, and avoid regional conflict," Jonathan Finer, the White House's deputy national security adviser, said on CBS' "Face the Nation" program.

The U.S. and Israel are preparing for every possibility, Finer added. There was a "very close call" of regional conflagration in April, Finer said, when Iran launched an attack on Israeli territory with drones and missiles after what it called an Israeli strike on its consulate in Damascus on April 1 that killed seven officers of the Islamic Revolutionary Guard Corps in the Syrian capital.

The U.S. wants to be prepared should that situation rise again, Finer added. In a call with his Israeli counterpart, the Pentagon said U.S. Defense Secretary Lloyd Austin reiterated the United States' support for Israel's security and "right to self-defense against threats from Iran, Lebanese Hizballah (Hezbollah), Houthis, and other Iranian-backed terrorist groups."

Blinken spoke with Iraqi Prime Minister Mohammed Shia al-Sudani on Sunday and emphasized "the importance of all parties taking steps to calm regional tensions, avoid further escalation, and advance stability," the State Department said.

'Prudent Planning'

Biden on Saturday expressed hope that Iran would stand down despite its threat to avenge Haniyeh's killing. The U.S. on Wednesday urged its citizens who wish to leave Lebanon to start making plans immediately. "This is no prediction about future events. It is prudent planning for them and for our government," Finer said on CBS.

The British government advised its nationals to leave Lebanon. Canada told its citizens to avoid all travel to Israel, saying the regional conflict endangers security. Haniyeh's death was one in a series of killings of senior Hamas figures in the Gaza war - with nearly 40,000 Palestinians killed, according to Gaza's health ministry - and it fueled concern of a wider Middle East conflict.

Hamas said it has begun a "broad consultation process" to choose a new leader to replace Haniyeh, who was the face of the group's international diplomacy. The U.S. and international partners including France, Britain, Italy and Egypt continued diplomatic contacts seeking to prevent further regional escalation.

Jordan's foreign minister, Ayman Safadi, will travel to Iran on Sunday in a rare visit to discuss regional developments with his Iranian counterpart, Iranian state media reported. Violence continued on Sunday in the Palestinian territories.

At least 25 Palestinians were killed and several others injured on Sunday in an Israeli strike targeting two schools that were sheltering displaced people near Gaza City, the official Palestinian news agency WAFA said.

Another strike hit a tent inside a hospital compound in central Gaza, killing at least five people, Gaza health officials said, after another round of talks ended without result.

https://economictimes.indiatimes.com/news/defence/us-says-military-moves-in-middle-east-aimed-at-de-escalating-tensions/articleshow/112274873.cms

FINANCIAL EXPRESS
Read to Lead

Sat, 03 Aug 2024

Akash-BrahMos-Scorpene: The Growing India-Brazil Defence Cooperation

India and Brazil are set to deepen their military cooperation with the forthcoming visits of two high-level delegations. The Commander of the Brazilian Navy and the Commander of the Armed Forces, along with senior officials, are scheduled to visit India soon (Aug-Sept, 2024).

“These visits are significant as they aim to finalize a Memorandum of Understanding (MoU) regarding the maintenance of `Scorpene’ submarines in Brazil, a key focus area of the bilateral talks,” a top diplomat told FinancialExpress.com.

This collaboration underscores the growing partnership between the two nations, reflecting a mutual commitment to enhancing defence capabilities and achieving self-reliance in critical areas. “The discussions will also explore potential acquisitions of military aircraft and new defence technologies, highlighting the multifaceted nature of this evolving relationship,” said the diplomat quoted above.

One of the key areas of cooperation between India and Brazil revolves around the maintenance of the `Scorpene’ submarines. As part of an ambitious effort to achieve self-reliance in defence production, India has been working towards indigenizing submarine maintenance capabilities. This initiative aims to enable India to perform essential tasks, repairs, and upgrades locally, thus reducing dependence on foreign technology and expertise.

FinancialExpress.com has reported previously that during a recent visit by a Brazilian delegation, led by the Commander of the Brazilian Navy and the Commander of the Armed Forces, discussions with Vice Admiral Sandeep Naithani, Chief of Materiel, focused on this very goal. Brazil’s valuable expertise in naval matters, particularly in submarine maintenance, provides a unique opportunity for India to accelerate its progress in this domain. By sharing knowledge and best practices, the two countries can bolster their naval preparedness, contributing to regional security in the Indian Ocean and beyond.

Indian Air Force’s Interest in Embraer’s C-390

Another significant aspect of the growing India-Brazil military ties is the potential acquisition of Embraer’s C-390 aircraft by the Indian Air Force (IAF). The Brazilian aircraft manufacturer has proposed the C-390 as a candidate for India’s Medium Transport Aircraft (MTA) requirement, which includes up to 80 aircraft. The C-390 is a versatile platform capable of fulfilling various roles, including military transport and aerial refuelling.

Embraer’s partnership with Mahindra Aerospace adds another layer of potential collaboration. The proposal includes not only manufacturing the C-390 in India but also the possibility of producing the E2 series regional commercial jet domestically. This initiative aligns with India’s ‘Make in

India' program, emphasizing domestic production and technological advancement in the aerospace sector.

Historical and Ongoing Cooperation

The India-Brazil defence relationship has been steadily growing over the years. In 2022, a landmark visit by a Brazilian Navy delegation, led by Vice Admiral Liberal Enio Zanelatto, marked a significant moment in this partnership. The delegation visited the Western Naval Command and Mazagon Dock Shipbuilders Limited (MDL) in Mumbai, where they observed the construction of the 'Scorpene' class submarines. They also inspected an Indian Navy Kalvari (Scorpene) class submarine, further deepening their understanding of India's naval capabilities.

These visits have facilitated discussions on various topics, including submarine technology, defence and security cooperation, and the shared maritime interests of both nations. The Brazilian Navy's interest in collaborating with India for the maintenance of their Scorpene-class submarines highlights the mutual benefits of this partnership. Additionally, discussions have also extended to the potential building of frigates for the Brazilian Navy, with India being shortlisted as a candidate for this project.

Expanding Defence Equipment Cooperation

Beyond submarines and aircraft, the two countries are exploring other areas of defence cooperation. The Brazilian Army has expressed interest in India's Akash Missile, a surface-to-air missile system developed by Bharat Electronics Limited (BEL). Although no formal decision has been announced, the establishment of a BEL office in Sao Paulo signifies a step towards greater defence collaboration. While this office will be for marketing purposes, it lays the groundwork for future engagements.

Moreover, the upcoming visit of the Brazilian delegation to India will include meetings with BrahMos Aerospace authorities. This engagement suggests potential discussions around the BrahMos missile, supersonic cruise missile developed jointly by India and Russia.

"Such meetings could pave the way for future acquisitions or collaborations in missile technology, further enhancing the strategic partnership between the two countries," the diplomat said.

Conclusion

The growing military cooperation between India and Brazil is a testament to their shared commitment to enhancing defence capabilities and achieving self-reliance. From submarine maintenance and aircraft acquisition to potential missile collaborations, the partnership covers a wide range of defence technologies and strategies.

As both nations continue to engage in high-level discussions and exchanges, the significance of their cooperation extends beyond bilateral ties. It contributes to regional stability and underscores the importance of international collaboration in addressing common defence challenges. The future of India-Brazil defence relations looks promising, with both countries poised to benefit from their deepening partnership.

https://www.financialexpress.com/business/defence-akash-brahmos-scorpene-the-growing-india-brazil-defence-cooperation-3572880/

Press Information Bureau
Government of India

Ministry of Science & Technology

Fri, 02 Aug 2024

New technology can help fabricate cost-effective & efficient piezoelectric devices for wearable applications

Researchers have found a droplet microfluidics technology to produce microspheres with high electroactive (EA) phase that can lead to piezoelectric devices for wearable applications, serving as self-powered sensors for monitoring diverse physiological signals.

Polymer microspheres, notable for their increased surface area and enhanced interface capabilities, have attracted substantial interest. However, existing methods for their production possess drawbacks such as shape irregularities and high energy requirements. To address these limitations, microfluidic techniques have emerged, offering benefits like tunability, size and shape control, efficiency and so on. Over the past years, microspheres of PVDF have been produced via microfluidics but the presence of high EA phase in them remains a challenge.

Researchers from Institute of Nano Science and Technology (INST), Mohali, an autonomous institute of Department of Science and Technology have introduced droplet microfluidics technology, combined with off-chip thermal polymerization technique to synthesize tunable Polyvinylidene fluoride (PVDF) microspheres to engineer high EA phase. The obtained microspheres exhibited uniformity and monodispersity with a narrow size distribution.

The high EA phase of microspheres was engineered through flow rates of oil and polymer solution in the microfluidic device and extensive characterization was carried out to verify the piezoelectric response of the microspheres.

The team brought about uniformity and size control (126-754 µm) of the microspheres. By adjusting flow rates and optimizing reaction temperature, the EA phase was enhanced to around 82%. Additionally, artificial intelligence (AI) was used as a vital tool in enabling accurate predictions for microsphere diameter and phases, reducing the need for extensive laboratory optimization prior to droplet generation in microfluidics. This work was recently published in the *Chemical Engineering Journal, Elsevier.*

As a proof of concept, the researchers explored the application of PVDF microspheres in the development of a flexible piezoelectric device that can seamlessly integrate with different parts of human body like elbow, knee, etc., through wearables. It underwent varying degrees of compression at different rates, depending on specific body movement, harnessing the energy generated by body movements that would otherwise go waste. This generated electrical response

proved to be substantial, providing enough output voltage (around 23V) to operate low-power devices.

Integration of this technology into wearables opens new pathways for efficient energy harvesting from human motion, paving the way for sustainable and self-sufficient wearable devices. The method offers numerous advantages, including simplicity, cost-effectiveness, high efficiency and control, making it highly significant for applications in biomedical sector, self-powered devices, and beyond. The research highlights the collaborative potential of microfluidics, polymer science, and AI, propelling the development of intelligent materials.

https://pib.gov.in/PressReleasePage.aspx?PRID=2040825

Press Information Bureau
Government of India

Ministry of Science & Technology

Sat, 03 Aug 2024

Council Scientific and Industrial Research (CSIR)- National Physical Laboratory (NPL) organizes a three-day program on Aerospace, Electronics, Instrumentation & Strategic Sector (AEISS) theme under the One Week One Theme

Council Scientific and Industrial Research (CSIR)- National Physical Laboratory (NPL) hosted a three-day workshop on AEISS theme from 2nd to 4th August at the NPL campus, as part of its 'One Week One Theme' initiative with participating labs CSIR-CSIO, CSIR-CEERI, and CSIR-IIP.

Prof. Venugopal Achanta, Director of CSIR-NPL, extended a warm welcome to attendees. Subsequently, Dr. Abhay Anant Pashilkar, Director of CSIR-NAL and AEISS Theme Director, delivered a keynote address. He elaborated on the AEISS theme, outlining its pivotal role in achieving Atmanirbhar Bharat, Swasth Bharat, and Make in India initiatives. He also discussed the projected targets associated with the AEISS theme.

Dr. P. C. Panchariya, Director of CSIR-CEERI, highlighted the crucial role of the AEISS theme in driving industrial growth. He also elaborated on the significance of a single window system for smooth and straightforward technology transfer.

Dr. S. K. Dubey, the workshop convenor, outlined the three-day agenda. This included a student-scientist interaction session, a Startup/MSME/Industry meet, and a focus on Women in AEISS. He concluded by proposing a vote of thanks. Over 60 students participated in the student-scientist interaction program. They explored the exhibition and engaged with scientists during the second session. A science quiz based on the exhibition concluded the first day of the event.

Brief event is scheduled as follows:

Day 1: Inaugural Function followed by an Exhibition showcasing the latest technologies and innovations in the field of science. As part of the Jigyasa program, school students are invited to visit the exhibition to increase their awareness of upcoming advancements and inspire their interest in science and technology. The product demonstrations of cutting-edge technologies are the focus of the exhibition at the NPL museum.

Day 2: Focus on Industry Collaborations, highlighting technologies developed and sold to industries by CSIR. Industries will have a platform for Panel Discussions where they can showcase their technologies and interact with leading experts. The day will also feature various Talks from Renowned Scientists, providing insights into their work's significance and enlightening us about new research and technologies. The Networking Sessions to foster collaboration and knowledge sharing.

Day 3: Celebrating Women in AEISS recognizing that women are equal contributors in every field. The final day will celebrate the achievements of women in science and technology, featuring Talks on New and Interesting Research by women scientists. These sessions aim to motivate and inspire young girls to pursue careers in technology development. These talks focus on critical topics and future trends.

https://pib.gov.in/PressReleasePage.aspx?PRID=2041070

The Indian EXPRESS

Mon, 05 Aug 2024

ISRO-NASA mission to ISS: 40 years after Rakesh Sharma, Subhanshu Shukla to be 2nd Indian to travel to space

Group captain Subhanshu Shukla will most likely become the first Indian in space in 40 years with Indian Space Research Organisation (ISRO) naming him the ‘prime’ astronaut for the first ISRO-NASA mission to the International Space Station, scheduled for any time after October this year.

ISRO on Friday said it had selected Shukla, 39, and Group Captain Prasanth Balakrishnan Nair, 48, for the Axiom-4 mission, and named Shukla as the ‘prime’ astronaut, meaning he would be the one who would go to the International Space Station. Nair is the backup for this mission. He will take over in case Shukla is unable to go due to any reason.

Only one Indian has ever been in space till now – Rakesh Sharma – who was wing commander when he flew on a Soviet spacecraft in 1984.

Shukla and Nair are among the four Indian air force officers selected for India’s first manned space mission, Gaganyaan, that is now tentatively scheduled for next year. The two will undergo further mission-specific training for the next eight weeks, an ISRO official said.

All four selected officers have already undergone rigorous training for the Gaganyaan mission.

Axiom-4 is the fourth mission by private space company Axiom Space in collaboration with NASA. The spacecraft would be launched by a SpaceX rocket. Apart from Shukla, three other

astronauts — one each from Poland, Hungary and the United States — will travel to the International Space Station. India's partnership in this mission was a result of an agreement between New Delhi and Washington during Prime Minister Narendra Modi's trip to the United States last year.

The Axiom-4 spacecraft would remain docked with the ISS for 14 days. Besides the astronauts, it will carry cargo, and supplies, for the ISS.

The exact date of the launch is not yet decided. NASA, on its website, says the mission was scheduled not earlier than October 2024. However, Poland's space agency POLSA, in a separate announcement today, said the mission was expected only next year. Shukla, 39, a fighter pilot who hails from Lucknow in UP, was commissioned in the IAF in 2006 and has over 2,000 hours of flying experience. He has flown a variety of IAF fighter jets including Sukhoi-30 MKIs, MiG-21s, MiG-29s, Jaguars, Hawks, Dorniers, and the AN-32 aircraft. Nair is a recipient of the sword of honour at the Air Force Academy and was commissioned in the IAF in 1998. He is a category A flying instructor and a test Pilot with over 3000 hours of flying experience. He is an alumnus of the United States Staff College and has commanded Sukhoi-30 squadron.

India's Gaganyaan mission is dependent on experience gained from the ISS mission by the Indian astronauts.

"This particular activity (Indo US collaboration on a space mission) is something that the US wants and India also finds it beneficial for the Indian space programme because once an Indian prepares to go to the ISS they will undergo a training in the US and they are going to come back and discuss how the training and this will help design our Gaganyaan better," ISRO chairman Somanath said in 2023.

https://indianexpress.com/article/technology/science/isro-astronauts-indo-us-mission-to-international-space-station-9491435/

ThePrint

Fri, 02 Aug 2024

Scientists identify Ladakh as potential analogue research site to conduct Moon, Mars mission studies

With the Indian Space Research Organisation's ambitious roadmap for its space programme in mind, scientists have proposed Ladakh as a potential site for the country's first analogue research station where conditions of the Moon and Mars can be emulated to test experiments. Gaganyaan, the country's first human spaceflight, landing the first Indian on the Moon by 2040, and sending an Indian astronaut to the International Space Station (ISS) are some of India's aspirational space projects.

A preprint study by Binita Phartiyal from the Birbal Sahni Institute of Palaeosciences (BSIP), Aloke Kumar from the Indian Institute of Science (IISc), and Shubhanshu Shukla, one of the four

astronaut designates for the Gaganyaan mission, pitched Ladakh as an ideal site for India's first analogue research station for its similarity to the lunar topography. Its terrain is also ideal for conducting experiments similar to those that will be conducted in ISRO's future Mars missions.

"India has set ambitious targets for its space programme and that necessitates the construction of terrestrial research stations that can simulate extra-terrestrial conditions. We believe that this is an opportune time for establishing an analogue research station in Ladakh, benefiting a diverse group of researchers," the research read.

Phartiyal told ThePrint that most of the existing analogue research sites in the world are located in extreme conditions. This helps researchers conduct space experiments and crew training because the conditions come close to the original mission conditions.

"Ladakh meets all the criteria for a potential analogue research station. The altitude provides it is a semi-arid desert, it has next to no vegetation as it is above the tree line, and it also has a variety of environments such as hot springs, frozen lakes, and hypersaline lakes, which are conditions that are very close to the conditions on the Moon and on Mars. India does not have an analogue station till now. Ladakh will be the perfect location for the first one," she said.

Elaborating how such a site will help the country's ambitions of landing the first Indian on the Moon and venturing into more human spaceflight and interplanetary missions, Phartiyal said that apart from just providing training for living in isolation, the analogue research station will also prepare astronauts to collect relevant data in addition to the research work being conducted in the region by the scientists.

"Astronauts will require training in a place similar to the original site to ensure the best samples are collected," she said.

Kumar, however, caveated that at the current stage, this is just a scientific proposal that aims to set the stage for the possibility of such a site in India. ISRO or the government will have to make a decision on actualising this.

"This is a prelude. Since India has taken a leap in its space programme by preparing for its first human spaceflight, such a site will serve great educational purposes. There is a lot of interest in India's space programme now. An indigenous effort such as this will give a greater thrust to the space programme and research around it," he told ThePrint.

An analogue research station is a place that has conditions similar to a planet or planetary body in terms of its topography and environment, among others. These stations act as testing grounds for relevant technologies, help advance technology readiness levels (TRL) and engineering integration, and help with human studies, crew training and research around geological, geomorphological, habitability, and life detection, among others.

The similarity in conditions helps scientists replicate interplanetary mission experiments and train astronauts under specific conditions.

Currently, there are 33 analogue research stations in the world. Some of the prominent ones are the BIOS-3 in Russia, which is a closed-loop biodome located at the Institute of Biophysics; HERA at US's Johnson Space Centre, a two-storey, four-port habitat; SHEE in Europe, a self-deployable portable habitat for extreme conditions; and the Mars Desert Research Station (MDRS) in US's

Utah, which is a private property developed for research, having multiple observatories and an analogue habitat.

Why Ladakh has been chosen

Researchers said that Ladakh's conditions were found to be a close match to the Moon and Mars because its dry, cold, and arid desert has abundant rocky ground, loose rock blanketing the mountain slopes, vast flat land, segregated ground ice and permafrost, rock glaciers, dunes, drainage networks, and catastrophic flooding make it geomorphologically similar to an early Mars and Moon.

"Hanley's dark skies in Ladakh are also a major astro-tourist attraction. The volcanic rocks and serpentinite exposures, the saline lakes, and the active and hydrothermal systems can give a clue to the processes and chemistry of the Martian grounds (geochemical fidelity)," the findings said.

Researchers also said that while the region was not naturally rich in craters, these can be created, as was done during the preparation of the Apollo missions at the Black Point lava and the Cinder Lake site. At these sites, craters were artificially created to test the working of rovers, vehicles, and equipment, and practise astronaut training.

"Sufficient isolation of the place also encourages the feeling of self-sufficiency and survival among the crew, a requirement for actual missions," the researchers said.

They added, "The Ladakh environment, characterised by its sub-zero temperatures, limited precipitation, rivers and lakes, comparatively low atmospheric pressure, hot-water springs, and relatively high ultraviolet flux, is an analogue for Mars and the Moon."

Phartiyal said that BSIP, Lucknow, has recently constituted the Earth and Planetary Exploration Group (EPEG) to look into astro-biological research. According to her, this EPEG group has expertise in chemical sciences, biological sciences, and geological sciences for exploring the Earth and conducting planetary exploration studies in the dedicated theme of 'Search for Life in the Extra-terrestrial Environments and Beyond'.

https://theprint.in/science/why-remote-ladakh-was-identified-as-site-for-indias-mars-moon-research-studies/2205135/

THE TIMES OF INDIA

Mon, 05 Aug 2024

Gaganyatri will conduct five experiments in space during ISS trip, says Isro chief; Nasa chief welcomes Indo-US space trip pact

Isro chairman S Somanath has announced that a Gaganyatri, who will be sent to the International Space Station (ISS) as part of a recent partnership with Nasa and US space company Axiom, will be "conducting five experiments," some of which have been developed in India and will be

onboard Axiom-Mission 4. During an online interaction with citizens, Somanath said, “We will also conduct some international experiments in collaboration with other space agencies, which are currently under discussion and at development stages.”

He further elaborated that when an Indian astronaut goes to the ISS, the objective is not just limited to experiments but also encompasses the entire process of learning.

“A Gaganyatri flying to the ISS will help us understand how India should prepare for Gaganyaan. When the astronaut experiences the flight, we can learn from how they conduct the mission and how the spacecraft docks with the ISS. Working with an international crew already stationed there will provide us with valuable knowledge. The prime astronaut on this mission will also receive training on how to conduct the mission,” the Isro chief added.

Nasa will be launching IAF Group Captain Shubhanshu Shukla as India’s Gaganyatri to the ISS. Welcoming the move, Nasa administrator Bill Nelson posted on X:

“Congratulations, ISRO. We look forward to welcoming the first ISRO astronaut to the International Space Station! This is a monumental step forward for the US-India partnership in space.”

“The experiences gained during this mission will be beneficial for the Indian Human Space Programme and will also strengthen human spaceflight cooperation between ISRO and Nasa,” the Indian space agency stated.

Meanwhile, Group Captain Shubhanshu Shukla’s family in Lucknow is elated after hearing about his selection for the ISS trip. His father, Shambhu Dayal Shukla, a retired govt officer, said the family is not nervous about the expedition but filled with pride.

His mother, Asha Shukla, described Shubhanshu, their youngest child, as “cool-minded” and someone who handles every situation calmly.

“Initially, I was resistant to his joining the armed forces and hoped he would pursue a civil service career. But when he was selected [for the armed forces], I didn’t object. When we received the news [of his selection for the ISS mission], nothing could match that moment. When the PM presented him with the astronaut badge, it was an unforgettable experience,” his father told mediapersons.

https://timesofindia.indiatimes.com/india/gaganyatri-will-conduct-five-experiments-in-space-during-iss-trip-says-isro-chief-nasa-chief-welcomes-indo-us-space-trip-pact/articleshow/112273624.cms