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समाचार पत्रों से चयित अंश Newspapers Clippings

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

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पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Sat, 09 Apr 2022 5:35 PM

पिनाका एमके-आई (और अधिक खूबियों के साथ) रॉकेट प्रणाली तथा पिनाका एरिया डेनियल म्यूनिशन रॉकेट प्रणाली का डीआरडीओ और भारतीय सेना द्वारा सफलतापूर्वक परीक्षण किया गया

पिनाका एमके- आई (और अधिक खूबियों के साथ) रॉकेट प्रणाली (ईपीआरएस) तथा पिनाका एरिया डेनियल मुनिशन (एडीएम) रॉकेट प्रणाली का पोखरण फायरिंग रेंज में रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) और भारतीय सेना द्वारा सफलतापूर्वक परीक्षण किया गया है। पिछले पखवाड़े में विभिन्न रेंज और युद्धक क्षमताओं के साथ कुल 24 ईपीआरएस रॉकेटों का परीक्षण किया गया। ट्रायल के दौरान परीक्षण के सभी उद्देश्यों को संतोषजनक तरीके से पूरा करते हुए इन रॉकेटों के द्वारा आवश्यक सटीकता और स्थिरता हासिल की गई थी। इन परीक्षणों के साथ ही, रक्षा उद्योग के द्वारा ईपीआरएस के टेक्नोलॉजी अब्सॉर्प्शन का प्रारंभिक चरण सफलतापूर्वक पूरा कर लिया गया है और इस क्षेत्र के भागीदार रॉकेट प्रणाली के उपयोगकर्ता परीक्षण / श्रृंखलाबद्ध उत्पादन के लिए तैयार हैं।

पिनाका रॉकेट प्रणाली को पुणे की आयुध अनुसंधान और विकास प्रतिष्ठान द्वारा विकसित किया गया है, जिसे डीआरडीओ के पुणे स्थित एक अन्य संस्थान उच्च ऊर्जा सामग्री अनुसंधान प्रयोगशाला के सहयोग से डिजाइन किया गया है।

ईपीआरएस रॉकेट प्रणाली का उन्नत संस्करण है, जो पिछले एक दशक से भारतीय सेना के साथ सेवा में है। उभरती आवश्यकताओं को पूरा करने के लिए इस प्रणाली को उच्च श्रेणी की प्रौद्योगिकियों के साथ उन्नत किया गया है। पिनाका के उन्नत रेंज संस्करण की प्रदर्शन प्रभावकारिता स्थापित करने के बाद प्रौद्योगिकी को रक्षा उद्योगों जैसे म्यूनिशन इंडिया लिमिटेड (एमआईएल) और इकोनॉमिक एक्सप्लोसिव्स लिमिटेड नागपुर में स्थानांतरित कर दिया गया था। इस अभियान के दौरान डीआरडीओ

से प्रौद्योगिकी हस्तांतरण के तहत एमआईएल द्वारा निर्मित रॉकेटों का परीक्षण किया गया। पिनाका रॉकेट प्रणाली में इस्तेमाल किए जा सकने वाले म्यूनिसन और फ़्यूज़ के विभिन्न रूपों का भी पोखरण फ़ील्ड फायरिंग रेंज में सफलतापूर्वक परीक्षण किया गया। रक्षा अनुसंधान एवं विकास विभाग के सचिव और डीआरडीओ के अध्यक्ष डॉ जी सतीश रेड्डी ने रिकॉर्ड समय में उन्नत प्रौद्योगिकियों पर आधारित नए डिजाइन के उन्नत रॉकेटों के परीक्षणों को पूरा करने के लिए टीमों को बधाई दी है।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1815264>



Sat, 09 Apr 2022

Pinaka MK-I, Pinaka area denial munition rocket systems successfully tested

Pinaka Mk-I (Enhanced) Rocket System (EPRS) and Pinaka Area Denial Munition (ADM) rocket systems have been successfully flight-tested by the Defence Research and Development Organisation (DRDO) and Indian Army at Pokhran firing ranges. A total of 24 EPRS rockets were fired for different ranges during the last fortnight. Required accuracy and consistency was achieved by the rockets meeting all trial objectives satisfactorily. These trials, the initial phase of technology absorption of EPRS by the industry has successfully been completed and the industry partners are ready for user trials/series production of the rocket system.

The Pinaka rocket system has been developed by Armament Research and Development Establishment, Pune, supported by High Energy Materials Research Laboratory, another Pune-based laboratory of DRDO. The EPRS is the upgraded version of the Pinaka variant which has been in service with the Indian Army for the last decade. The system has been upgraded with advanced technologies enhancing the range to meet the emerging requirements. After establishing the performance efficacy of the enhanced range version of Pinaka, the technology was transferred to the industries viz. Munitions India Limited (MIL) and Economic Explosives Limited Nagpur. Rockets manufactured by MIL under Transfer of Technology from DRDO were flight tested during this campaign. Different variants of munitions and fuzes which can be used in the Pinaka rocket system were also successfully test evaluated in the Pokhran field firing range.

<https://www.indiatoday.in/india/story/pinaka-mk-i-pinaka-area-denial-munition-rocket-systems-successfully-tested-1935517-2022-04-09>



**Press Information Bureau
Government of India**

Ministry of Defence

Fri 08 Apr 2022 3:31 PM

DRDO successfully flight-tests Solid Fuel Ducted Ramjet technology off Odisha coast

Defence Research and Development Organisation (DRDO) successfully flight tested Solid Fuel Ducted Ramjet (SFDR) booster at the Integrated Test Range (ITR), Chandipur off the coast of Odisha on April 08, 2022. The test successfully demonstrated the reliable functioning of all critical components involved in the complex missile system and met all the mission objectives.

The SFDR-based propulsion enables the missile to intercept aerial threats at very long range at supersonic speeds. The performance of the system has been confirmed from the data captured by a number of range instruments like Telemetry, Radar and Electro Optical Tracking Systems deployed by ITR. The SFDR has been developed by Defence Research and Development Laboratory, Hyderabad in collaboration with other DRDO laboratories such as Research Centre Imarat, Hyderabad and High Energy Materials Research Laboratory, Pune.

Raksha Mantri Shri Rajnath Singh has congratulated DRDO for the successful trial of SFDR. He termed it as an important milestone towards development of critical missile technologies in the country. Complimenting the teams involved in design, development and testing, Secretary, Department of Defence R&D and Chairman DRDO Dr G Satheesh Reddy said, with the successful trial of SFDR, the range of air-to-air missiles can be enhanced.

<https://pib.gov.in/PressReleaseDetailm.aspx?PRID=1814813>



**THE NEW
INDIAN EXPRESS**

Sat, 09 Apr 2022

SFDR boost for long range air to air missiles

The Defence Research and Development Organisation (DRDO) achieved yet another feat by successfully testing solid fuel-ducted ramjet (SFDR) booster from a defence facility off Odisha coast on Friday. The new technology will help develop long range air-to-air missiles. Defence sources said a prototype of an air-to-air missile based on the ramjet technology was flight tested from the Integrated Test Range (ITR) at about 10.30 am to check the performance of the system.

The test has successfully demonstrated the reliable functioning of all critical components involved in the complex missile system and met all the mission objectives.



After the ground booster phase the missile was guided to high altitude to simulate aircraft release conditions. Subsequently, the nozzle-less booster was ignited and it accelerated the system to the required Mach number for ramjet operation, said the sources. The performance of the system has been confirmed from the data captured by a number of range instruments like telemetry, radar and electro optical tracking systems (EOTS) deployed by ITR. Developed by Hyderabad-based Defence Research and Development Laboratory (DRDL) in collaboration with other DRDO laboratories, the SFDR based propulsion enables the missile to intercept aerial threats at supersonic speeds at very long range. All the subsystems including the booster and nozzle-less motor performed as expected. So far, the technology was available only with a handful of countries in the world. The successful validation of the technology will enable DRDO to develop long range air-to-air missiles.

Complementing the teams involved in design, development and testing, Secretary of Department of Defence R&D and DRDO Chairman Dr G Satheesh Reddy said with the successful trial of SFDR, range of air to air missiles can be enhanced. The air breathing ramjet technology will propel long range air-to-air missiles to engage with targets at supersonic speed and high accuracy. The missiles will provide a multi-layered aerial protection to important establishments from hostile attacks. Defence Minister Rajnath Singh congratulated DRDO for the successful test of SFDR and termed it an important milestone towards development of critical missile technologies in the country.

<https://www.newindianexpress.com/states/odisha/2022/apr/09/sfdr-boost-for-long-range-air-to-air-missiles-2439917.html>

Business Standard

Sat, 09 Apr 2022

India to train Philippines military on BrahMos systems from July onwards

Filipino military personnel would start arriving in India from July-August onwards to receive training on operating the BrahMos supersonic cruise missile system. Having activated the first anti-ship cruise missile battalion earlier this month, Filipino military personnel would start arriving in India from July-August onwards to receive training on operating the BrahMos supersonic cruise missile system for which they signed a contract worth over USD 375 million in January. Government officials told ANI that presently, Indo-Russian joint venture company BrahMos Aerospace is helping the Philippines military in setting up the bases for the anti-ship missile system.

The first set of BrahMos missile system is expected to reach Manila in around the next 18 months. Their military personnel would start arriving in India for training on the missile system by July-August timeframe this year, the officials said. After activating their first BrahMos missile battalion, the Philippines Marine Corps stated that it will be operating one of the best antiship missile systems on the planet which can quickly detect, track, chase and destroy targets, media reports from the Philippines said. BrahMos Aerospace would impart training to the Philippines marine corps personnel in Delhi and Hyderabad where they have main production and training centres. The deal with the Philippines for the BrahMos missiles is the biggest ever export contract signed by India with any foreign country and is expected to open doors for many doors in southeast Asia.

The contract includes training of the firing and maintenance crew for the missiles. The missile system will be delivered to the Philippines within the stipulated timeframe. BrahMos Aerospace and DRDO have been working towards enhancing the capabilities of the BrahMos missile inducted already in the three services and its range has been extended successfully. The missile was at the centre of a controversy recently when it got accidentally fired during a routine inspection from a missile base in western India and landed in Pakistan without causing any significant damage. After the incident, the Philippines and some other countries had sought clarification on the issue. The Indian officials from Delhi had communicated the reasons for the incident and they understood the matter completely, officials said. The issue is over for all sides and now the Philippines military is preparing for its future with the BrahMos missile system.

https://www.business-standard.com/article/current-affairs/india-to-train-philippines-military-on-brahmos-systems-from-july-onwards-122040900475_1.html

Sun, 10 Apr 2022

DRDO working on an unmanned ground combat vehicle (UGCV) based on Arjun MK-1A MBT

In the April 2022 in the publication of DRDO's technology focus, it was mentioned that the DRDO's Combat Vehicles Research and Development Establishment (CVRDE) is working on the design and development of an Unmanned Ground Combat Vehicle (UGCV) based on the Arjun M-1A Main Battle Tank (MBT) that will feature the 120 millimetres main gun as the primary weapon. The DRDO plans to employ the Indigenous Geographical Information System (IGIS) to provide the unmanned tank operator with a visual perspective of the operational terrain and the location of the tank. This will be used to generate a feasible route for the tank to follow and reach an operator-defined target location.

Indigenous Engine

Combat Vehicles Research & Development Establishment (CVRDE), a premier establishment of DRDO is involved in the design and development of Battle tanks for Indian Army. CVRDE has taken initiative to develop indigenous engine to power futuristic combat vehicles. In this regard CVRDE designed 600hp engine ab-initio, which is compact, efficient, light weight due to incorporation of advanced technologies. The engine is comparable to contemporary battle tank engines. Ashok Leyland, a leading automotive industry is identified as Development cum Production Partner by CVRDE for manufacturing of 600hp engine. Ashok Leyland had applied modern & innovative methods and completed manufacturing of engine in a record time.

Successful induction of 600hp engine in Indian Army through the indigenous efforts of DRDO and Indian industry will result in development of series of engines for other battle tanks. This will lead to self-reliance in Tank Engine technology, which in turn result in plethora of advantages viz., Spin off technology for other applications, savings in FE, export of tank engines and generation of employment in Indian industry. according to the press release issued by CVRDE.

<http://www.indiandefensenews.in/2022/04/drdo-working-on-unmanned-ground-combat.html?m=1>

DRDO On Twitter



DRDO
@DRDO_India

Solid Fuel Ducted Ramjet (SFDR) successfully flight tested from Integrated Test Range (ITR), Chandipur off the coast of Odisha

@rajnathsingh
@SpokespersonMoD

pib.gov.in/PressReleaseDet...



5:44 PM · Apr 8, 2022 · Twitter for iPhone



DRDO
@DRDO_India

Pinaka Mk-I (Enhanced Range) Rocket System with advanced technology, various munitions and new fuzes successfully flight-tested in a series of trials held at Pokhran.

@DefenceMinIndia
@SpokespersonMoD

pib.gov.in/PressReleasePa...



7:00 PM · Apr 9, 2022 · Twitter for iPhone

Defence News

Defence Strategic: National/International

हिन्दुस्तान

Mon, 11 Apr 2022

अब रात के अंधेरे में भी नहीं बच पाएगा दुश्मन! इस तरह पैनी नजर रखेगी भारतीय सेना; ट्रिपल आईटी ने डीआरडीओ को भेजी तकनीक

अब भारतीय सेना रात के अंधेरे में भी दुश्मन की हर हरकत पर पैनी नजर रख सकेगी। इसके लिए ट्रिपल आईटी ने आधुनिक डीप-लर्निंग कृत्रिम बुद्धिमत्ता पर आधारित नई तकनीक विकसित की है। आर्टिफिशियल इंटेलिजेंस से जवान सीमाओं की सुरक्षा कर सकेंगे। यह अहम शोध दो साल में पूरा कर संस्थान के वैज्ञानिकों ने रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) को भेज दिया है। इस तकनीक

से बेहद कम रोशनी में या यूँ कहें कि अंधेरे में घटित होने वाले आपराधिक कृत्यों की साफ सुथरी तस्वीर मिल सकेगी। इस तकनीक को विजुअल सर्विलांस प्रक्रिया में भी प्रयोग लाया जा सकता है। देश की सुरक्षा एंजेंसियों की इस तकनीक से सुरक्षा संबंधी मसलों को हल करने में काफी मदद मिलेगी। संस्थान के इंफॉर्मेशन टेक्नोलॉजी विभाग के एसोसिएट प्रोफेसर सतीश कुमार सिंह ने बताया कि इस तकनीक को विकसित करने के लिए डीआरडीओ की ओर ग्रांट मिली थी।

गहरी रात के परिदृश्य में भी दिन के उजाले का होगा आभास

डॉ. सिंह ने बताया कि ट्रिपल आईटी के वैज्ञानिकों ने अपने प्रयासों से नाइट विजन तकनीक विकसित की। इस तकनीक के उपयोग से बहुत गहरी रात के परिदृश्य में भी दिन के उजाले का दृश्य वातावरण बनाना संभव है। अनिवार्य रूप से प्रौद्योगिकी अपनी दृष्टि की सीमा के तहत सभी जीवित और निर्जीव वस्तुओं के थर्मल हस्ताक्षर को पकड़ने और आभासी दृश्य को फिर से बनाने (रीक्रिएट) के लिए बहुत परिष्कृत संवेदन विधियों का उपयोग कर रही है। जैसे कि रात्रि के दृश्य को तेज धूप में कैद किया गया हो। विकसित तकनीक उपयोगकर्ताओं की ओर से अपने आसपास के अज्ञात इलाके में पर्यावरण को समझने में बहुत मददगार होगी।

<https://www.livehindustan.com/uttar-pradesh/story-prayagraj-news-now-enemy-will-not-be-able-to-survive-even-in-dark-indian-army-to-keep-close-watch-on-it-triple-it-sent-technology-to-drdo-6235228.html>



Fri, 08 Apr 2022

Are Drones The Future of Defence? Check Out These 5 Companies

The geopolitical chess game continues to progress on various fronts at an incredible rate. Over the last one week, reports are surfacing that Ukraine recaptured more territory around Kyiv from Russian soldiers, while a disputed cross-border strike in Russia is complicating peace talks. The implications of the current events are unknown, but commodity prices are spiking and that too aggressively.

Amid all this, the prospects of the defence sector have accelerated. The Russia-Ukraine war has made one thing very clear. The best way to avoid war is to be well prepared for it. Given the strained relationship we share with our two neighbours China and Pakistan, the defence sector plays a crucial role. So it should come as no surprise that defense is at the centre of *Atmanirbhar Bharat*. While you may have seen images of explosions and fights involving tanks and missiles in the Russia-Ukraine conflict, the little-known drones are finding their niche. Drones or Unmanned Aerial Vehicle (UAV), were behind the destruction of a Russian convoy by the

Bayraktar TB2, as claimed by the Ukrainian Air Force. These are the same drones the Azerbaijani forces used effectively in the 2020 Nagorno-Karabakh conflict against Armenia. So it's clear that drones are playing a critical role in Ukraine's defense against the Russian invasion. Drone technology is now a tool of frontline combat.

The various uses of drones in modern warfare

There are drones across many categories from commercial quadcopters used for observing enemy movements and coordinating artillery strikes, to a combat-proven armed drones.

Let's look at various use cases of drones in a modern-day warfare.

Logistics support - Drones can be used to provide logistics support to soldiers who are either on the battlefield or in areas that are hard to access.

Drones can create supply chains that get to the troops without delays. Here, the risk of losing an individual also gets eliminated. When war zones and stations are hard to reach, drones come into play and take out conventional logistical methods. Drones can carry thousands of kilos of ammo, heavy weapons and even missiles. So you get an advantage here.

Data collection and surveillance - When it comes to data collection and surveillance, drones are considered to be the best source when one needs to sneak across borders. They can stay miles away and provide real-time updates.

Strikes and combat – The track record of precision and payload of combat drones and how well it can perform in a combat mission is spectacular. Combat drones can carry a lot of payloads and can fly for hours or even days in some cases. These were just a few use cases. In the years to come, drones may feature even more sophisticated technologies.

How drones are modernising the Indian Army

Drones are evolving Indian Army's defence tech applications and resource-multiplication. Last month, the Indian Army said it will soon operate Indian drones for surveillance. Last year, the Indian army had surveyed high-altitude zones in LAC via indigenous drones. Now, instead of keeping soldiers out in the cold for patrolling, drones act as their ears and eyes.

That's not all.

The Indian Army is also using drones to supply the booster doses of Covid-19 vaccines to the troops in the snowbound areas of Jammu and Kashmir. Slowly and steadily, the Indian Army is building a solid ecosystem for drones.

Indian companies that are making their mark

Drone stocks are making headlines. The increased usage of drones across industries has created a market opportunity that's too big to ignore.

Here are few drone companies in India you should keep a watch on.

Paras Defence & Space Tech

Through its subsidiary Paras Aerospace, Paras Defence primarily focuses on drone related aerospace technology development. This subsidiary was launched back in 2019. Paras Defence, via its subsidiary, has tied up with a few UAV manufacturers in Israel, Latvia, & Italy. This partnership helps the company in accessing state of the art solutions. Israel has been producing drones since 1980 for various applications. It has a strong legacy in this domain. In fiscal 2021, Paras Defence entered into a partnership with High Lander, which provides end-to-end solutions for the management of autonomous drone fleets. The company heavily focused on drones. It's one of the leading IDDM category private sector Indian firms catering to various defence segments. The company has received a lot of attention of late.

Zen Technologies

Zen Technologies was the sole listed player active in manufacturing drones in India. This changed when Paras Defence listed. Along with drone manufacturing, the company also provides defence training solutions and anti-drones solutions. The stock was hot property back in September 2021 when it doubled in a matter of weeks. This after it received large orders from Indian Air force, including for drones. It currently has a counter drone order of ₹ 100 crore, which will be executed in the next nine months.

Reliance Industries and Adani Enterprises

Back in August 2021, big corporates Reliance and Adani expressed interest to manufacture or assemble drones in India. Reliance will be participating via Jio Platforms, which owns Asteria Aerospace while Adani Enterprises has Adani Defence and Aerospace, a step-down subsidiary. Both groups showed interest after the new drone rules came out. They hope to take advantage of the PLI scheme.

L&T

Infra giant Larsen & Toubro (L&T) is also involved in drone industry. Almost two years ago, L&T entered into a pact with ideaForge, a drone manufacturer, to offer drones and allied systems for defence use.

Hindustan Aeronautics

Monopoly player Hindustan Aeronautics is developing a drone named 'Warrior'.

This drone is being developed to go into combat as a loyal wingman drone with existing manned fighter jets like LCA Tejas and Rafale. The drone, which is being developed along with a private player, will be capable of performing surveillance, reconnaissance, and early warning missions to aid its mission. It's expected that Warrior will launch in 2024. The company is also designing drones to carry payloads.

RattanIndia Enterprises

This penny stock has been making headlines ever since it announced its foray into the drone business. RattanIndia Enterprises has forayed into the drone business through its wholly owned

subsidiary NeoSky. The company is expecting the commercial rollout of products in the first quarter of fiscal 2023.

To conclude...

Militaries across the globe are investing heavily in drone technology. Drones are expected to become a part of life for everyone in the coming years. Drones will bring a variety of routine activities. But more importantly, they will give the needed boost to the defence sector. Until 2016, India's R&D efforts for drones had suffered due to restrictions imposed by Missile Technology Control Regime (MTCR). This regime considers drones as weapons. With India now a member of this cartel, it has better access to technologies and foreign partnerships. With help from DRDO, several Indian companies are now venturing into drone manufacturing through joint ventures with foreign firms. Drones are the future of defence. Don't be surprised if more companies tap into this evolving theme in the months and years to come.

<https://www.ndtv.com/business/are-drones-the-future-of-defence-check-out-these-5-companies-2870578>



Sun, 10 Apr 2022

Indian Coast Guard commissions latest Advanced Light Helicopter MK-III squadron in Bhubaneswar

In a boost to maritime security, the Indian Coast Guard (ICG) on Sunday commissioned the latest Advanced Light Helicopter (ALH-Dhruv) MK-III squadron in Bhubaneswar in Odisha. The most advanced variant of ALH will enhance maritime capabilities of force along West Bengal and Odisha Coast and beyond, said ICG officials. Manufactured by state-run aerospace behemoth Hindustan Aeronautics Ltd (HAL), the helicopter was commissioned in the presence of by Indian Coast Guard chief VS Pathania. The major variants of Dhruv are classified as Dhruv Mk-I, Mk-II, Mk-III & Mk-IV.

These helicopters are equipped with state-of-the art equipment like Surveillance Radar, Electro Optic Pod, Medical Intensive Care Unit, High Intensity Search Light, SAR Homer, Loud Hailer, Machine Gun and can perform other key roles, according to HAL. Last year in June, three ALH Mk-III were inducted into the stables of the Indian Coast Guard. The Indian Coast Guard is expected to induct 10 new ALH by May 2022, its spokesperson said in December last year. The ICG has concluded a contract for procurement of 16 helicopters from HAL, Bengaluru, which is in consonance with Aatmanirbhar Bharat Abhiyan, the spokesperson said.

ALH-Dhruv is a twin engine, multi-role, multi-mission new generation helicopter in the 5.5 ton weight class. The basic helicopter is produced in skid version and wheeled version. Dhruv is “type –certified” for Military operations by the Centre for Military Airworthiness Certification (CEMILAC) and civil operations by the Directorate General of Civil Aviation (DGCA), the

HAL said. The ICG has a total of 68 aircraft such as Dornier and ALH in its fleet currently. It also has a total of 158 ships including OPVs, FPVs, ACVs and PCVs in its fleet right now.

<https://www.timesnownews.com/india/indian-coast-guard-commissions-latest-advanced-light-helicopter-mk-iii-squadron-in-bhubaneswar-article-90756660>



Sun, 10 Apr 2022

The Agnipath of Agniveers- Tour of duty

The government of India has proposed a new concept of recruitment for the armed forces calling the youth to come forward as Agniveers to serve the motherland by treading the path of Agnipath. It is proposed that the youth will be sent on a tour of duty for a period of three years, and they will be eligible for government service. The thought is noble but is fraught with uncertainties. A profession of arms is not a career, it's a way of life. Traditionally generation after generation followed the footsteps of their fathers and in the present day the mothers too.

Indian Defense Forces have been a volunteer force for all ranks. There is no draft, volunteers are put through a selection process and tested for their medical fitness and put through rigorous training of approximately 44 weeks, in which a trainee is put through the basics of military training which encompasses physical training, drill, fieldcraft, weapon training while developing a strong bonding with co-trainees, which last a lifetime. The period of 44 weeks each recruit/trainee is under close observation and assessment and those who are weak, undisciplined, cannot imbibe the ethos, traditions of the services, are weeded out. This ensures that the young soldiers passing out from the regimental centres/training academies are responsible citizens trained to fight and kill and not mercenaries who are hired guns, who are neither accountable or responsible.

What are the challenges?

The Indian Army in particular is tasked to combat external threats but internal strive as well. Since independence the Indian Army has been in a state of No War No Peace. The Indian Army is trained to fight along the coastal plains, jungles, and plains with multiple obstacles, semi-desert/deserts, high altitude and super high altitude. To be a trained and skilled warrior is an investment of time and effort over several years. Regular training and honing battle procedures and drills so that the team from the rank and file to a unit functions as a well-oiled fighting machine. Fighting units operate in a buddy pair system, the faith, trust and confidence in accomplishing the mission is a criticality that cannot be ignored at the cost of National Security. A three-year tour of duty will be a challenge for the units who will not know what to do with young eager beavers engaged to perform in a serious profession of soldiering.

Rationale – Tour of Duty

The political leadership have views that Indian youth needs to be 'disciplined' and 'desh-bhakti', love for country above all else. It seems an easy path to generate more employment opportunities for the underprivileged youth. Bring about an egalitarian culture for parity and tolerance nationwide, without any prejudice against women, religion or politics. Create an economically

strong India, with peace and amity, internally and externally. The political leaders have turned their focus mainly on the military, paramilitary and Department of Defence Production.

The 'takeaway' that the political leadership hopes for is not just inculcation of self-discipline and value system of the military by youth, but also vocational training with some technical content, which would help them find employment in the civic 'milieu' in India or abroad. It will also ameliorate the 'fighting strength' shortfalls that armed forces have been lamenting for a long time. Now the regimental recruitment is from specific catchment areas. This is likely to become 'pan India', In a survey conducted by the Ministry of Labour & Employment, amongst 62 MSMEs and 43 Pvt, Ltd and Public enterprises, almost 98% responded that they would prefer to have a disciplined labour force with a military background.

The Flaw in the Proposal

I do not disagree that jobs have to be created, the youth should be disciplined, love and respect for the country is supreme. The current recruitment procedures allow the volunteers to join irrespective of colour, caste, creed and religion. Discipline is because the serving personnel have restricted rights and are under the Defence Services Regulations and the respective Acts of the service. A veteran is not under these restrictions and hence the newly found freedom is often seen as a vacuum and pressure release valve to give vent to feelings throttled over the years, what is the guarantee that a youngster who has been fast-tracked into the services and has had to endure the hardships against his/her will not be disgruntled. A trip to the hills of Kullu-Manali will reflect the number of Israeli released soldiers who seek nirvana in the good weed available.

Cost-Benefit Analysis

The total cost (from pre-commissioning training up to severance package) for an SSC officer serving for a 10-year term works out to 5.12 Crores and for a 14-year term it climbs up to 6.93 Crores. If an officer gets the PC, the liability for his pay and allowances up to an age of 54 years is another 3 Crores while about 9 Crore is spent in pensions up an age of 75 years. Compared to the above, the end-to-end cost of a Tour of Duty combatant is being projected as 80-85 Lakhs. The above demonstrates how easy it is to take the public, especially the simple and trusting serviceman for a ride. The calculations seem to convey that the cost of a Tour of Duty combatant is only 80-85 lakhs, while that of a regular commissioned officer who serves till the age of 54 years is 9.93 crores. Of course, what has not been conveyed is that the Tour of Duty combatant is serving for only three years, while the regular officer is serving for approximately 33 years. It would, therefore, not take one Tour of Duty combatant but 11 of them to replace one regular officer. The cost would thus be anything between 8.8 to 9.35 crores! Where then, is the saving? Only in terms of pensionary benefits? And what do we lose? Growth within the organization, stability, experience & skills, motivation.

The above calculation also mentions that 9 crores would be spent on pensions for a regular officer up to the age of 75 years. How did they arrive at that figure? If, as stated, the officer retires at the age of 54, then he will draw a pension for 21 years or 504 months. 9 crores would thus translate into a monthly pension pay out of 1.75 lakhs per month. Who is getting that amount? While we do not see any other service or organization carrying out any significant cost-cutting measures, the Armed Forces continue to be the favourite whipping boys of the financial mandarins. Reduce the manpower, reduce the intake, accept existing shortfalls in manpower, reduce the availability of experienced, battle-hardened soldiers, and reduce the quality or capabilities of weapons and equipment. But expect the same level of competence and dedication. All for a few dollars less.

Ex-gratia Payment – Compensation

The employment of the youth will be in low-intensity conflict, line of control and line of actual control, casualties will occur, a greenhorn vis a vis an experienced soldier is likely to be high and its transient impact on morale and fighting efficiency in the rank and file has to be deliberated upon. The compensation being paid this day will have to be budgeted for, will these numbers be more or less, needs to be worked out realistically, and will we be penny wise and pound foolish? Considering this number is rupees one crore plus on an average. Let me refer back to the Galwan like situation, a clash that was fought with raw courage and left the conscripted soldiers of the PLA at a loss. It is suggested that the Territorial Army is a platform and has multiple roles wherein volunteers serve, without diluting the combat efficiency of fighting units. Specific assignments to handle social media, hacking, cyber security and OSINT data collection need to be explored.

<https://www.financialexpress.com/defence/the-agnipath-of-agniveers-tour-of-duty/2487189/lite/>



Fri, 08 Apr 2022

Govt reserves 25% defence procurement budget for domestic private industry

The amount set aside for domestic defence procurement this year is 68% of the defence services capital acquisition budget, which is ₹1.24 lakh crore. As part of its efforts to encourage the private sector to take part in defence production, the Union defence ministry has earmarked 25% of the domestic capital acquisition budget or ₹21,149 crore for the sector, the ministry said in a statement on Friday. This comes two months after India set aside 68% of the capital procurement budget for the entire domestic industry during 2022-23 to promote self-reliance in the defence sector. This translated into an amount of ₹ 84,597.89 crore.

India allocated ₹5.25 lakh crore for military spending in this year's budget, including a total capital budget of ₹1.52 lakh crore for the modernisation of the armed forces. This year's capital outlay is 12.8% higher than the budget estimates for 2021-22 when it was ₹1.35 lakh crore. The amount set aside for domestic defence procurement this year is 68% of the defence services capital acquisition budget, which is 1.24 lakh crore.

India set aside ₹70,221 crore — 64% of the military's capital budget — for domestic defence procurement last year, compared to ₹ 51,000 crore, or 58% of the capital budget, in 2020-21.

<https://www.hindustantimes.com/india-news/govt-reserves-25-defence-procurement-budget-for-domestic-private-industry-101649442599636.html>

Defence Minister Rajnath Singh arrives in Washington to attend India-US 2+2 dialogue

Defence Minister Rajnath Singh arrived in Washington DC on Sunday as part of his five-day US visit which includes the India-US 2+2 ministerial dialogue. Rajnath will be in the US from April 10 to April 15 to hold talks with US leadership on ways to deepen the India-US strategic partnership. "I would be leaving New Delhi tonight for a visit to the United States from April 10 to April 15. I look forward to attending the Fourth India-US 2+2 Ministerial Dialogue in Washington DC. Also, I shall be visiting INDOPACOM headquarters in Hawaii, during this visit," Defence Minister said in a tweet on Saturday. US Secretary of Defense Lloyd Austin will welcome Indian Defence Minister in an enhanced honour cordon ceremony at the Pentagon on April 11 (Sunday). India and the US are set to hold the 2+2 dialogue between Defence Minister Rajnath Singh, External Affairs Minister (EAM) S Jaishankar and their respective American counterparts on Sunday. "The Dialogue would enable both sides to undertake a comprehensive review of cross-cutting issues in the India-US bilateral agenda related to foreign policy, defence and security with the objective of providing strategic guidance and a vision for further consolidating the relationship," a Ministry of External Affairs (MEA) statement read.

"The 2+2 Dialogue will also provide an opportunity to exchange views about important regional and global developments and how we can work together to address issues of common interest and concern," the statement added. The US State Department in a media has note informed that US State Secretary Antony Blinken and Secretary of Defense will welcome their Indian counterparts in Washington DC on Sunday. The US State Department said, "The relationship between the world's largest democracies is built on a foundation of common values and resilient democratic institutions, and the shared Indo-Pacific interests of a rules-based international order that safeguard the sovereignty and territorial integrity, uphold human rights and expands regional and global peace and prosperity."

The EAM, who will be visiting the US on April 11-12, will also meet his counterpart, Secretary of State Blinken separately and is also scheduled to meet senior members of the US administration to advance India-US strategic global partnership, MEA spokesperson Arindam Bagchi informed during a briefing. Ahead of the 2+2 dialogue, Secretary of State Antony Blinken on Tuesday spoke with EAM Jaishankar on a phone call to review regional and global priorities, including the situation in Ukraine. The last 2+2 Ministerial Dialogue between the two countries was held in October 2020 in New Delhi. India and the United States held a bilateral 2+2 inter-sessional meeting in September last year in Washington and exchanged assessments on developments in South Asia, the Indo-Pacific region and the Western Indian Ocean. Ahead of the 2+2 dialogue between India and the US, Prime Minister Narendra Modi is scheduled to hold a virtual meeting with US President Joe Biden on Monday.

<https://economictimes.indiatimes.com/news/india/defence-minister-rajnath-singh-arrives-in-washington-to-attend-india-us-22-dialogue/articleshow/90765063.cms>

Fri, 08 Apr 2022

India-US to talk about military trade; Focus on UAVs, fighter jets, satellite launch and Russia-Ukraine crisis

Free and open Indo-Pacific, joint production of military platforms, new technologies, drones and global issues of mutual interest are topping the agenda of the fourth India-US 2+2 Ministerial Dialogue on April 11, 2022.

MEA announces the visit

On Thursday the Ministry of External Affairs (MEA) announced the visit of external affairs minister Dr S Jaishankar to the US for the 2+2 ministerial from April 11-12, in Washington DC. Both defence Minister Rajnath Singh and external affairs minister Dr Jaishankar will have joint dialogue with their counterparts Secretary of State Antony Blinken and Secretary of Defence Lloyd Austin.

Objective of the visit

Bilateral agenda related to foreign policy, defence and security and providing strategic guidance and vision for further consolidating of relations. The dialogue between the two countries next week will also provide an opportunity to the two sides to discuss and exchange views on the regional and global developments and how the two sides can work together to address issues which are of common interest and concern.

On Social Media

Secretary of State Blinken wrote on social media that the two countries mark 75 years of US-India diplomatic relations. Adding, the fourth 2+2 Ministerial Dialogue will reaffirm the strategic growing partnership between the two countries. Also, as part of an ongoing and regular dialogue, Dr Jaishankar will also have a separate meeting with his American counterpart and to further advance the India-US Comprehensive Global Strategic Partnership, according to MEA he is scheduled to meet senior members of the US Administration.

Importance of the visit of the two top ministers to the US

The visit comes at a time when the Russia-Ukraine crisis has deepened, and the UN General Assembly has adopted a resolution to suspend the rights of membership of the Russian Federation in the Human Rights Council. The West and its allies are pushing for more strict sanctions against Russia, countries like Iran, Russia have started accepting payments for oil imports in local currencies, and the pressure is on India to take a stand against Russia. Military trade, Indo-Pacific, QUAD (India, Japan, Australia and the US) and QUAD of Israel, UAE, the US and India, deepening of military ties, maritime security, are on the table for both sides to talk about.

Military trade to touch \$ 25 billion soon.

In 2016, US under the Trump administration has designated India as a Major Defence Partner, following this in 2018, India was elevated to Strategic Trade Authorization Tier 1 status. Under this status India will get a license-free access to an entire range of military and dual-use technologies. These technologies have been regulated by the US Department of Commerce. The military trade between the two countries is expected to touch USD 25 bn by 2025. The trade between the two sides is through Foreign Military Sales (FMS) route. Both countries have already inked critical agreements for deepening defence cooperation like the Compatibility and Security Agreement (COMCASA), Logistics Exchange Memorandum of Agreement (LEMOA), Communications, the Industrial Security Agreement (ISA) and BECA.

Deals expected to be discussed

Deals including 57 fighters for the Indian Navy's aircraft carrier, 114 combat aircraft for the Indian Air Force, UAVs for the three services, equipment for the Special Forces, large aircraft infrared countermeasure, a missile defence system for large aircraft, the Integrated Air Defence Weapon System (IADWS), and more.

Space Cooperation

The two countries are expected to talk about deeper cooperation in Outer Space, and the launch of the jointly developed NASA-ISRO Synthetic Aperture Radar (NISAR) satellite in 2023. Space agencies of both countries are already working together in the Satellite Navigation (SatNav) and the US Congress has in principle decided to designate the Indian Regional Navigation Satellite System (IRNSS) as an "allied system".

KC-46 Tanker for the IAF

Recently, state owned Hindustan Aeronautics Limited (HAL) and Israel Aerospace Industries (IAI) had signed an agreement for the conversion of the B767 class of civil aircraft to a Multi Mission Tanker Transport (MMTT) aircraft. Last year, in an exclusive interaction with Financial Express Online, Torbjorn Sjogren, VP, International Government & Defence, Boeing Global Services, had said that the company is in talks with the Indian Air Force (IAF) KC-46 tanker which is a derivative of the Boeing 767 passenger aircraft.

Financial Express Online had reported recently that the F/A-18 Super Hornet will be on the agenda of 2+2 Ministerial Dialogue. Recent reports indicate that next month F/A-18 Super Hornet aircraft will land in Goa for the trials. These aircraft are expected to be shortlisted for the Indian Navy's requirement of 57 deck based jets for the IAC 1. Also, according to sources, the numbers of the aircraft needed for the aircraft carrier could go up as the Russian-Ukraine crisis continues and the upgrade of the existing MiG-29K could get delayed.

Will the F-15EX feature in talks?

Ahead of the dialogue, Boeing vice president and F-15 program manager Pratt Kumar was in India. The company has offered F-15EX for the requirement of 114 fighter jets for IAF. Sources

have told Financial Express Online that he had met with senior officers in the Ministry of Defence. UAVs from General Atomics is another big ticket item which is going to be discussed when defence minister Rajnath Singh will discuss the pending deals with his counterpart and other senior officers in the Biden administration. Also, sale of a USD 189 Large Aircraft Infrared Countermeasure, a missile defence system for large aircraft used by VVIPs is pending. Another deal valued at USD 1.867 billion — the Integrated Air Defence Weapon System (IADWS) has yet to fructify. This was already approved by the previous US administration for sale to India. A deal estimated to cost USD 5 million is Communications Security Account and Equipment. A relatively small deal is a very important component for enhancing interoperability and is used for advancing communication.

Leasing Option

Since the Indian armed forces are open to the idea of leasing military platforms to meet urgent requirements, this too will be discussed with the US side on Monday.

<https://www.financialexpress.com/defence/india-us-to-talk-about-military-trade-focus-on-uavs-fighter-jets-satellite-launch-and-russia-ukraine-crisis/2486076/>

THE ECONOMIC TIMES

Fri, 08 Apr 2022

India-US defence ties to stay on ambitious course bound by common vision for Indo-Pacific: Pentagon

Bound by "shared values and a common vision" for a free and open Indo-Pacific region, the US and India will continue to chart an ambitious course in their bilateral defence partnership to meet the challenges of the 21st century, the Pentagon has said. In a statement on Thursday, ahead of the fourth 2+2 ministerial dialogue to be held here on April 11, the Pentagon said US Defence Secretary Lloyd Austin and Secretary of State Antony Blinken will host Indian Defence Minister Rajnath Singh and External Affairs Minister S Jaishankar.

"Bound by shared values and a common vision for a free and open Indo-Pacific region, the United States and India will continue to chart an ambitious course in the bilateral defence partnership," the Pentagon said in the statement. India, the US and several other world powers have been talking about the need to ensure a free, open and thriving Indo-Pacific in the backdrop of China's rising military manoeuvring in the region. China claims nearly all of the disputed South China Sea, though Taiwan, the Philippines, Brunei, Malaysia and Vietnam all claim parts of it. Beijing has built artificial islands and military installations in the South China Sea. Since its inception in 2018, the 2+2 Ministerial has allowed the US and India to work toward building an advanced, comprehensive defence partnership that is poised to meet the challenges of the 21st century, the Pentagon said.

This year's 2+2 Ministerial Dialogue will span the full breadth of the partnership - including defence, science and technology cooperation, climate, public health, and people-to-people ties, it said. According to the State Department, this year's event will celebrate 75 years of diplomatic

relations and reaffirm the importance of the US-India Comprehensive and Global Strategic Partnership in ensuring international peace and security.

"It will reaffirm our shared commitment to a free, open, and prosperous Indo-Pacific region," it said. The 2+2 Ministerial is an important opportunity to advance the shared objectives across the breadth of the US-India strategic partnership, including enhancing people-to-people ties and education cooperation, building diverse and resilient supply chains for critical and emerging technology. It would also be aimed at scaling up climate action and public health cooperation and developing a trade and investment partnership to increase prosperity for working families in both countries, it said.

"It is also a chance to highlight the growing Major Defence Partnership between the United States and India. The relationship between the world's largest democracies is built on a foundation of common values and resilient democratic institutions, and the shared Indo-Pacific interests of a rules-based international order that safeguards sovereignty and territorial integrity, upholds human rights and expands regional and global peace and prosperity," the State Department said.

<https://economictimes.indiatimes.com/news/defence/india-us-defence-ties-to-stay-on-ambitious-course-bound-by-common-vision-for-indo-pacific-pentagon/articleshow/90723682.cms>



Mon, 11 Apr 2022

India forms high-level committee to decide on curtailed predator drone deal with US

Amid a strong push by Prime Minister Narendra Modi government for 'Make in India' in defence, the Defence Ministry has formed a committee under a three star-rank officer to decide on the curtailed deal for buying predator drones from the US. As per the plans, India was earlier planning to acquire 30 of these high-altitude long-endurance drones equipped with strike capability, including missiles, which were to be equally distributed among the three services.

"A committee has been formed under a Lieutenant General-rank officer of the Integrated Defence Staff headquarters to decide on the number of Predator drones that the three services should buy to meet their requirements till the time indigenous development of similar equipment can be done," government sources told ANI. Sources said the three services have requirements for these drones which can be used for surveillance as well as attacking enemy targets from standoff distances. Almost all the defence deals planned through the import route had either been scrapped or put on hold by the Defence Ministry on the directions of the Prime Minister's Office in favour of indigenous weapon systems.

India is operating two predator drones which were hired on lease from an American firm and they have been helping the Navy to keep track of activities in the Indian Ocean Region. The movement of Chinese research vessels and Anti piracy Escort Force is also constantly monitored by the two drones acquired on lease from the Americans. has acquired 12 American P-8I anti-

submarine warfare and surveillance planes for keeping an eye on the IOR and was working on getting six more of these planes. However, after the government's instructions on import programmes, the government would soon decide on the project too shortly.

In line with the Prime Minister's directions, the Indian Navy is now charting an indigenous roadmap for all its requirements of weapon systems and equipment. PM Modi has been giving a lot of stress on indigenisation and also recently told armed forces and other stakeholders that only made in India systems can provide them with unique solutions.

<http://www.indiandefensenews.in/2022/04/india-forms-high-level-committee-to.html>



Fri, 08 Apr 2022

रूस-यूक्रेन जंग से सबक लेगी भारतीय सेना, युद्धक टैंकों की डिजाइनिंग में होंगे अहम बदलाव

रूस और यूक्रेन के बीच जारी जंग से सबक लेकर भारतीय सेना भविष्य को ध्यान में रखते हुए नए सिरे से रणनीतियां बनाने में जुट गई है। इस जंग ने जहां कई तरह के सवाल खड़े किए हैं, वहीं युद्ध कौशल को लेकर कई नई बातें भी सामने आई हैं। अब तक के जंग से स्पष्ट हो चुका है कि इसमें बख्तरबंद वाहनों के मुकाबले एंटी-टैंक मिसाइलें सफल रही हैं, जिससे भारतीय सेना भी सबक लेने जा रही है। रूस-यूक्रेन में जारी जंग के बीच कई रिपोर्ट्स से यह सामने आया है कि रूसी बख्तरबंद वाहनों की कमजोरी का फायदा उठाने के लिए यूक्रेन ने टैंक-रोधी निर्देशित मिसाइलों का व्यापक पैमाने पर इस्तेमाल किया है और महत्वपूर्ण सफलता भी हासिल की है। इस पर भारतीय सशस्त्र बलों की भी नजर है। यह इसलिए और भी अहम हो जाता है, क्योंकि वहां टैंकों सहित जिन भी उपकरणों का इस्तेमाल हो रहा है, उनमें बहुत से उपकरण आम हैं।

भविष्य में किए जा सकते हैं अहम बदलाव

समाचार एजेंसी ANI ने सरकारी सूत्रों के हवाले से दी रिपोर्ट में कहा है कि इस संबंध में जो भी जानकारी आ रही है, उसका विश्लेषण किया जा रहा है और भविष्य में मुख्य युद्धक टैंकों को विकसित किए जाने के क्रम में इन खूबियों को उसमें शामिल किया जा सकता है, जिसका इस्तेमाल भारतीय सेना करेगी। इससे भारतीय सेना की ताकत और बढ़ेगी तथा दुश्मनों से उत्पन्न होने वाले खतरों से मुकाबले में उसकी क्षमता में इजाफा होगा। भारतीय सेना रूसी बख्तरबंद वाहनों के सबसे बड़े इस्तेमालकर्ताओं में से एक रही है, जिसमें T-90, T-72 और BMP सीरीज के लड़ाकू वाहन शामिल हैं। भारतीय सेना पूर्व में इन्हें केवल पाकिस्तान के साथ लगने वाली रेगिस्तानी व मैदानी सीमाओं पर ही तैनात करती थी, लेकिन अब ये चीनी सीमा पर भी भारतीय प्रतिरोध की पहचान बन गए हैं। लद्दाख से लेकर सिक्किम तक बड़ी संख्या में चीन से लगने वाली सीमा पर इनकी तैनाती की गई है।

बीस साबित हो रही हैं टैंक रोधी मिसाइलें

रूस-यूक्रेन जंग की बात करें तो इसे 46 दिन हो चुके हैं। इस दौरान अमेरिका, यूरोप के देशों ने रूस पर कड़े प्रतिबंधों की घोषणा की है तो ये कार्ल गुस्ताफ एंटी-टैंक रॉकेट लॉन्चर, NLAWs और AT-4s जैसे एंटी-टैंक, एंटी-एयरक्राफ्ट उपकरणों की आपूर्ति भी धड़ल्ले से यूक्रेन को कर रहे हैं। बख्तरबंद वाहनों के संचालन से जुड़ी जानकारी रखने वाले अधिकारियों के मुताबिक, टैंकों का डिजाइन जहां कम से कम तीन-चार दशक पुराना है, वहीं टैंक रोधी मिसाइलों और रॉकेटों को नवीनतम जरूरतों के अनुसार डिजाइन किया गया है और मौजूदा समय में यह बीस साबित हो रहा है।

<https://www.timesnowhindi.com/india/article/indian-army-to-incorporate-lessons-from-russia-ukraine-as-anti-tank-missiles-achieve-significant-success-against-armour/398855>



Fri, 08 Apr 2022

DSA 2022: China's Poly Defence displays GAM-10X anti-tank guided missile system



Poly Defence's GAM-100 short-range ATGM has a maximum speed of 170 m/s. (Janes/Shivanand BM)

State-owned Chinese company Poly Defence displayed its indigenously developed GAM-10X anti-tank guided missiles (ATGMs) at the Defence Services Asia (DSA) 2022 exhibition in Kuala Lumpur. The GAM-10X series consists of the GAM-100 and GAM-102. The former is a short-range ATGM with an effective range of 200–2,500 m, while the latter is a medium-range system with an effective range of 300–4,000 m. The systems use uncooled components and self-developed infrared (IR) core ships, which significantly decreases the warm-up period, according to Poly Defence.

The GAM-100 variant has a length of 1,200 mm and a weight of 13 kg. The missile has a maximum speed of 170 m/s. The individual shoulder and soft-launch profiles permit firing from

a fighting position or confined spaces. It features a tandem-shaped charge, which allows a penetration depth of 800 mm. The whole system is composed of a GAM-100 anti-tank missile, a launch tube assembly, and a command launch unit. The missile sports an IR seeker in its nose and is stabilised in flight by way of spring-loaded fins. Fins are located aft of the missiles at midway point and at the tail. Once launched from its holding tube, the missile's fin automatically folds out and the projectile is guided to its target by the IR imaging homing seeker. The GAM-102 missile's modular design allows for integration and installation on a variety of vehicle platforms, from light all-terrain vehicles to tracked infantry fighting vehicles. According to Poly Defence, the missile adopts a high-explosive tandem-charged armour penetration warhead that is able to realise about 1,000 mm penetration depth.

<https://www.janes.com/defence-news/news-detail/dsa-2022-chinas-poly-defence-displays-gam-10x-anti-tank-guided-missile-system>

Science & Technology News



Sat, 09 Apr 2022

Making India a bio-defence and virus attenuation hub

As the Indian economy tries to bounce back the economy after Covid-19, and the Union Budget 2022-23 laid down the vision of “Amrit Kaal”, where the country aims to be the third largest economy in the world, can we afford another lockdown from a new strain of virus? In January 2022, post the double dose of vaccination several people got affected by Covid-19, although the fatality was lot less. This led to states like Delhi, Maharashtra and West Bengal to announce local lockdown measures. The threat of the pandemic is real, and it can come back in some form in the future. The only way forward to achieving our growth target and reach “Amrit Kaal” may be to have a better pandemic management. In this regard, Indian home-grown companies can play a key role in coming up with innovative products for virus attenuation.

The current strategy for tackling the virus is onenhancing “personal safety” through vaccination, masks, social distancing andclosing of schools, colleges, malls, workplaces. This is leading to manifold losses. Travel and tourism came to a halt. Malls and offices had to close down. Students could not go to schools and colleges. For students, going to school helps in enhancing social skills, joint project participation, clearing doubts and learning by doing in laboratories. One cannot eat in a restaurant without opening the mask. Therefore, there is need for more holistic product development and policy approach focusing on “Mass Safety” in buildings and enclosed spaces. A recent survey by ICRIER found that a few Indian start-ups have come up with products for “Mass Safety”, which uses innovative technologies for bio-defence and virus attenuation. Some of these products have gone through proper due diligence, laboratory testing and certification and are now being used in the domestic market and are exported. For example, Shycocan, a coronavirus and influenza virus attenuation device, is exported to UAE (Dubai),

Oman, Kuwait, Australia, Singapore, Vietnam, Thailand, Philippines, Malaysia, Europe, South Africa, Botswana, Nigeria, and Ghana. It is being used by companies such as Jubilant Lifesciences, Jubilant Ingrevia, Wallace Pharmaceuticals, DRDO, Indian Army and by retail businesses, restaurants and entertainment hubs. It has also helped schools and colleges reopen safely. However, for such use and to scale-up these” Make in India” products, there is need for government approval, support and right policies.

During the consultations, respondents pointed out that to grow in a relative new area like technology for bio-attenuation, companies can only become successful globally by becoming successful in their home country first. Support of the government will accelerate the scale-up and this support can be subject to proper due diligence like evaluation of the laboratory test reports and certifications. Further, the consultation felt clarity on the right nodal agency for bio-defence and virus attenuation products approval will be extremely beneficial for start-ups. During the consultations, stakeholders pointed out that they face three key issues: First, as this is a new category of devices, there is uncertainty on the correct ministry/nodal department who should be approached; second, with no clear set of guidelines, even the departments approached are unable to support the start-ups and third, they are unable to get the processes and requirements online. Unlike large firms, start-ups have limited bandwidth to do physical visits to ministries and departments. Therefore, for ease of doing business there is a need to set up a streamlined process for evaluation and support of innovative products. Indian start-ups must compete globally, and policy support will help them to scale-up. Indian companies are coming up with innovative technologies and India is the third largest technology start-up hub in the world.

One nodal agency like DPIIT could fast-track the processes of approval by coordinating with other ministries/ department, according to the stakeholders. India cannot afford to let go the multi-million-dollar opportunities to create Unicorns in innovative technologies, through delays in approval process. India is signing trade agreements at a fast pace. The trade deal with the UAE was signed in a record time and negotiations with the UK and Australia, will close soon. Consultations revealed that the trade deals are a lucrative opportunity for innovative firms provided the domestic processes are in place and the Government endorses indigenous technologies by start-ups. India needs to put in its domestic processes in place and then seek mutual recognition in standards and processes in key export markets. The Government can be an enabler to help Indian companies emerge as leaders in this area like Bio-Attenuation.

<https://www.dailypioneer.com/2022/columnists/making-india-a-bio-defence-and-virus-attenuation-hub.html>



Sat, 09 Apr 2022

IIT Madras launches first affordable, Made-In-India prosthetic knee called 'Kadam'

IIT Madras researchers have launched the country's first Made-in-India polycentric prosthetic knee. Called 'Kadam', the affordable prosthetic knee can transform the lives of thousands of

above-knee amputees through not just mobility with ease, but also increased community participation, access to education, livelihood opportunities and overall well-being.

Who created the prosthetic knee?

It was developed by a team at TTK Center for Rehabilitation Research and Device Development (R2D2) at IIT Madras, which also developed and commercialized 'Arise,' the country's first standing wheelchair and NeoFly-NeoBolt, an active wheelchair and motorized add-on for seamless indoor-outdoor mobility.

The WHO states that only 1 in 10 people in need, have access to assistive technology and they are not available in adequate numbers and at affordable prices. R2D2 headed by Prof. Sujatha Srinivasan has been working to fill that gap.

R2D2 is involved in research related to human movement, and the design and development of rehabilitation and assistive devices for people with movement impairments. The R2D2 centre engineers user-centric affordable products for rehabilitation needs in India and beyond, works with clinical specialists, NGOs, and hospitals, among others, to field-test the designs, and fosters a research environment to evaluate assistive device designs from biomechanical and functional standpoints. The polycentric knee has been developed in association with Society for Biomedical Technology (SBMT) and Mobility India.

SBMT, which supported the development, was established under DRDO by former President Dr. APJ Abdul Kalam to enable indigenous medical device development.

Mobility India, an NGO in Bengaluru, will mass manufacture and take Kadam to the market along with overseeing the processes of fitment and training and ensuring easy access for the users.

Features Of The Prosthetic Knee

The unique aspects of Kadam include:

- Suitable for short/long residual limbs after transfemoral (above-knee) amputation
- Polycentric 4-bar knee joint provides the user better control of flexion-extension
- Made of high strength materials: aluminium alloy - Al 6061 T6, stainless steel-SS 304
- Customizable stability adjustment depending on the user's need
- Frictional swing control adjustment for different walking speeds
- Patented 4-bar geometry (Indian Patent No. 338006) provides stability even on uneven terrain, and improved ground clearance
- Provides maximum knee flexion of 160 degrees or more (range limited by socket)
- Multi-centric user testing conducted with users walking on different surfaces and steep slopes
- ISO 10328 Compliant for Proof strength, Ultimate Strength, Fatigue Strength for P4 condition (80 kg user weight)

What makes kadam better than others?

Kadam has advantages over a hinge joint because of the multiple axes of rotation, which provide the user greater control over the prosthesis while walking and maximum knee flexion of 160 degrees to make it easy to sit in cramped spaces like buses and autos. It is designed for durability with high strength stainless steel and aluminium alloy along with hard chrome plated

EN8 pins and high fatigue life polymer bushings. Indigenously developed Kadam is affordable and at the same time, of high quality and performance, complying with ISO 10328 standards including 30 lakh cycles of fatigue testing.

provides stability, reduces the risk of stumbling and its patented geometry is specifically optimized for use on uneven terrains. Through Mobility India, extensive clinical trials have been conducted in various geographical settings urban, periurban and rural, the feedback from which have ensured that the design is user-centric and functional in different environments. Users instantly recognize the stable nature of the knee. The ability of the user to let go of the safety of parallel bars in the very first trial is a testimony to the performance of the knee.

Word on the prosthetic knee

“What bridges the world of a differently-abled person with that of others is technology,” said Thiru Johny Tom Varghese IAS, State Commissioner for Persons with Disability, Government of Tamil Nadu, at the launch.

<https://www.indiatoday.in/education-today/news/story/iit-madras-first-affordable-made-in-india-prosthetic-knee-kadam-1935464-2022-04-09>



TECH INDIA EXPRESS

Sun, 10 Apr 2022

New System Allows Severely Motor-Impaired Individuals To Type Quickly and Accurately

For individuals who communicate using a single switch, a new interface learns how they make selections, and then self-adjusts accordingly. In 1995, French fashion magazine editor Jean-Dominique Bauby suffered a seizure while driving a car, which left him with a condition known as locked-in syndrome, a neurological disease in which the patient is completely paralyzed and can only move muscles that control the eyes. Bauby, who had signed a book contract shortly before his accident, wrote the memoir “The Diving Bell and the Butterfly” using a dictation system in which his speech therapist recited the alphabet and he would blink when she said the correct letter. They wrote the 130-page book one blink at a time.

Technology has come a long way since Bauby’s accident. Many individuals with severe motor impairments caused by locked-in syndrome, cerebral palsy, amyotrophic lateral sclerosis, or other conditions can communicate using computer interfaces where they select letters or words in an onscreen grid by activating a single switch, often by pressing a button, releasing a puff of air, or blinking. But these row-column scanning systems are very rigid, and, similar to the technique used by Bauby’s speech therapist, they highlight each option one at a time, making them frustratingly slow for some users. And they are not suitable for tasks where options can’t be arranged in a grid, like drawing, browsing the web, or gaming.

A more flexible system being developed by researchers at MIT places individual selection indicators next to each option on a computer screen. The indicators can be placed anywhere — next to anything someone might click with a mouse — so a user does not need to cycle through a

grid of choices to make selections. The system, called Nomon, incorporates probabilistic reasoning to learn how users make selections, and then adjusts the interface to improve their speed and accuracy. Participants in a user study were able to type faster using Nomon than with a row-column scanning system. The users also performed better on a picture selection task, demonstrating how Nomon could be used for more than typing.

“It is so cool and exciting to be able to develop software that has the potential to really help people. Being able to find those signals and turn them into communication as we are used to it is a really interesting problem,” says senior author Tamara Broderick, an associate professor in the MIT Department of Electrical Engineering and Computer Science (EECS) and a member of the Laboratory for Information and Decision Systems and the Institute for Data, Systems, and Society. Joining Broderick on the paper are lead author Nicholas Bonaker, an EECS graduate student; Emlil-Mari Nel, head of innovation and machine learning at Averly and a visiting lecturer at the University of Witwatersrand in South Africa; and Keith Vertanen, an associate professor at Michigan Tech. The research is being presented at the ACM Conference on Human Factors in Computing Systems.

On the clock

In the Nomon interface, a small analog clock is placed next to every option the user can select. (A gnomon is the part of a sundial that casts a shadow.) The user looks at one option and then clicks their switch when that clock’s hand passes a red “noon” line. After each click, the system changes the phases of the clocks to separate the most probable next targets. The user clicks repeatedly until their target is selected. When used as a keyboard, Nomon’s machine-learning algorithms try to guess the next word based on previous words and each new letter as the user makes selections. Broderick developed a simplified version of Nomon several years ago but decided to revisit it to make the system easier for motor-impaired individuals to use. She enlisted the help of then-undergraduate Bonaker to redesign the interface.

They first consulted nonprofit organizations that work with motor-impaired individuals, as well as a motor-impaired switch user, to gather feedback on the Nomon design. Then they designed a user study that would better represent the abilities of motor-impaired individuals. They wanted to make sure to thoroughly vet the system before using much of the valuable time of motor-impaired users, so they first tested on non-switch users, Broderick explains.

Switching up the switch

To gather more representative data, Bonaker devised a webcam-based switch that was harder to use than simply clicking a key. The non-switch users had to lean their bodies to one side of the screen and then back to the other side to register a click. “And they have to do this at precisely the right time, so it really slows them down. We did some empirical studies which showed that they were much closer to the response times of motor-impaired individuals,” Broderick says.

They ran a 10-session user study with 13 non-switch participants and one single-switch user with an advanced form of spinal muscular dystrophy. In the first nine sessions, participants used Nomon and a row-column scanning interface for 20 minutes each to perform text entry, and in the 10th session they used the two systems for a picture selection task. Non-switch users typed 15 percent faster using Nomon, while the motor-impaired user typed even faster than the non-switch users. When typing unfamiliar words, the users were 20 percent faster overall and made half as many errors. In their final session, they were able to complete the picture selection task 36 percent faster using Nomon. “Nomon is much more forgiving than row-column scanning.

With row-column scanning, even if you are just slightly off, now you've chosen B instead of A and that's an error," Broderick says.

Adapting to noisy clicks

With its probabilistic reasoning, Nomon incorporates everything it knows about where a user is likely to click to make the process faster, easier, and less error-prone. For instance, if the user selects "Q," Nomon will make it as easy as possible for the user to select "U" next. Nomon also learns how a user clicks. So, if the user always clicks a little after the clock's hand strikes noon, the system adapts to that in real time. It also adapts to noisiness. If a user's click is often off the mark, the system requires extra clicks to ensure accuracy.

This probabilistic reasoning makes Nomon powerful but also requires a higher click-load than row-column scanning systems. Clicking multiple times can be a trying task for severely motor-impaired users. Broderick hopes to reduce the click-load by incorporating gaze tracking into Nomon, which would give the system more robust information about what a user might choose next based on which part of the screen they are looking at. The researchers also want to find a better way to automatically adjust the clock speeds to help users be more accurate and efficient.

They are working on a new series of studies in which they plan to partner with more motor-impaired users. "So far, the feedback from motor-impaired users has been invaluable to us; we're very grateful to the motor-impaired user who commented on our initial interface and the separate motor-impaired user who participated in our study. We're currently extending our study to work with a bigger and more diverse group of our target population. With their help, we're already making further improvements to our interface and working to better understand the performance of Nomon," she says.

"Nonspeaking individuals with motor disabilities are currently not provided with efficient communication solutions for interacting with either speaking partners or computer systems. This 'communication gap' is a known unresolved problem in human-computer interaction, and so far there are no good solutions. This paper demonstrates that a highly creative approach underpinned by a statistical model can provide tangible performance gains to the users who need it the most: nonspeaking individuals reliant on a single switch to communicate," says Per Ola Kristensson, professor of interactive systems engineering at Cambridge University, who was not involved with this research. "The paper also demonstrates the value of complementing insights from computational experiments with the involvement of end-users and other stakeholders in the design process. I find this a highly creative and important paper in an area where it is notoriously difficult to make significant progress." This research was supported, in part, by the Seth Teller Memorial Fund to Advanced Technology for People with Disabilities, a Peter J. Eloranta Summer Undergraduate Research Fellowship, the MIT Quest for Intelligence, and the National Science Foundation.

<https://techindiaexpress.in/new-system-allows-severely-motor-impaired-individuals-to-type-quickly-and-accurately/>



Sun, 10 Apr 2022

Exotic Black Hole Behavior: 10 New Gravitational Waves Found in LIGO-Virgo's O3a Data

In the last seven years, scientists at the LIGO-Virgo Collaboration (LVC) have detected 90 gravitational waves signals. Gravitational waves are perturbations in the fabric of spacetime that race outwards from cataclysmic events like the merger of binary black holes (BBH). In observations from the first half of the most recent experimental run, which continued for six months in 2019, the collaboration reported signals from 44 BBH events. But outliers were hiding in the data. Expanding the search, an international group of astrophysicists re-examined the data and found 10 additional black hole mergers, all outside the detection threshold of the LVC's original analysis. The new mergers hint at exotic astrophysical scenarios that, for now, are only possible to study using gravitational wave astronomy. "With gravitational waves, we're now starting to observe the wide variety of black holes that have merged over the last few billion years," says Physicist Seth Olsen, a Ph.D. candidate at Princeton University who led the new analysis. Every observation contributes to our understanding of how black holes form and evolve, he says, and the key to recognizing them is to find efficient ways to separate the signals from the noise.

Olsen will describe how his group found the mergers on April 11 during a session at the APS April Meeting 2022. He will also field questions from the media during an online press conference April 11 at 10 a.m. EDT. Notably, the observations included phenomena from both high- and low-mass black holes, filling in predicted gaps in the black hole mass spectrum where few sources have been detected. Most nuclear physics models suggest that stars can't collapse to black holes with masses between about 50 and 150 times the mass of the sun. "When we find a black hole in this mass range, it tells us there's more to the story of how the system formed," says Olsen, "since there is a good chance that an upper mass gap black hole is the product of a previous merger." Nuclear physics models also suggest that stars with less than twice the mass of the sun become neutron stars rather than black holes, but almost all observed black holes have been more than 5 times the mass of the sun. Observations of low-mass mergers can help bridge the gap between neutron stars and the lightest-known black holes. For both the upper and lower mass gaps, a small number of black holes had already been detected, but the new findings show that these types of systems are more common than we thought, Olsen says.

The new findings also include a system that scientists had never seen before: A heavy black hole, spinning in one direction, engulfing a much smaller black hole that had been orbiting it in the opposite direction. "The heavier black hole's spin isn't exactly anti-aligned with the orbit," Olsen says, "but rather tilted somewhere between sideways and upside down, which tells us that this system may come from an interesting subpopulation of BBH mergers where the angles between BBH orbits and the black hole spins are all random." Identifying events like black hole mergers requires a strategy that can distinguish meaningful signals from background noise in observational data. It's not unlike smartphone apps that can analyze music—even if it's played in a noisy public place—and identify the song that's being played. Just as such an app compares the

music to a database of templates, or the frequency signals of known songs, a program for finding gravitational waves compares the observational data to a catalog of known events, like black hole mergers.

To find the 10 additional events, Olsen and his collaborators analyzed LVC data using the “IAS pipeline,” a method first developed at the Institute for Advanced Studies and spearheaded by Princeton astrophysicist Matias Zaldarriaga. The IAS pipeline differs in two important ways from the pipelines used by the LVC. First, it incorporates advanced data analysis and numerical techniques to improve on the signal processing and computational efficiency of the LVC pipelines. Second, it uses a statistical methodology that sacrifices some sensitivity to the sources that LVC approaches are most likely to find in order to gain sensitivity to the sources that LVC approaches are most likely to miss, such as rapidly spinning black holes. Previously, Zaldarriaga and his team have used the IAS pipeline to analyze data from earlier runs of the LVC, and similarly identified black hole mergers that were missed in the first-run analysis. It’s not computationally feasible to simulate the entire universe, Olsen says, or even the staggeringly wide range of ways in which black holes might form. But tools like the IAS pipeline, he says, “can lay the foundation for even more accurate models in the future.” Other collaborators on the analysis include Tejaswi Venumadhav at the University of California at Santa Barbara and the Tata Institute of Fundamental Research; Jonathan Mushkin and Barak Zackay at Weizmann Institute of Science; and Javier Roulet at the University of California at Santa Barbara.

<https://scitechdaily.com/exotic-black-hole-behavior-10-new-gravitational-waves-found-in-ligo-virgos-o3a-data/>

