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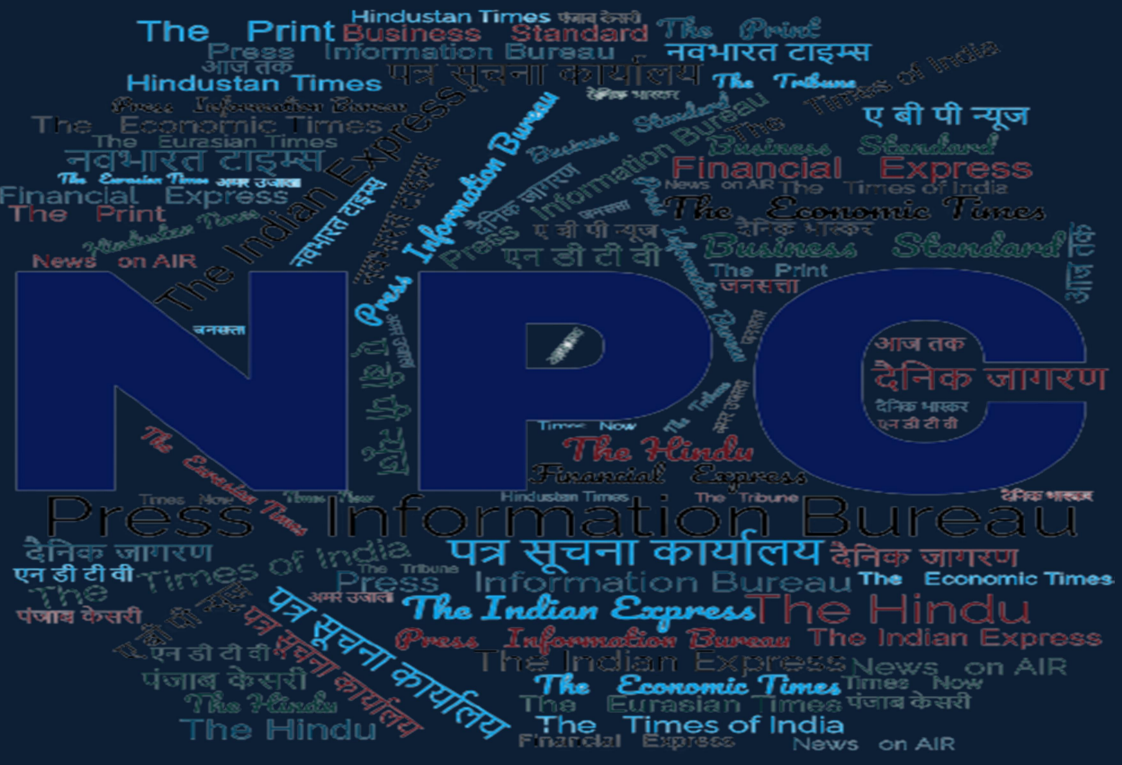
समाचार पत्रों से चयित अंश

Newspapers Clippings

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

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



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CONTENTS

DRDO News

DRDO Technology News

Udaipur Kiran

Thu, 26 Jan 2023

डीआरडीओ ने दिखाए सुरक्षा खतरों को बेअसर करने वाले राडार सिस्टम

रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) ने गणतंत्र दिवस परेड के दौरान कर्तव्य पथ पर अपनी झांकी में अत्याधुनिक रक्षा प्रणालियों का प्रदर्शन किया. डीआरडीओ की झांकी का विषय 'कम्युनिकेशन एंड न्यूट्रलाइजिंग थ्रेट्स' रखा गया. इस झांकी को चार भागों में बांटा गया था, जिसके पहले भाग में अंडरवाटर सर्विलांस प्लेटफॉर्म प्रदर्शित किया गया.

झांकी में पनडुब्बियों के लिए यूशस-2 जैसे सोना (Gold)र, जहाजों के लिए हम्सा शृंखला के सोना (Gold)र और हेलीकॉप्टर लॉन्च निगरानी के लिए कम आवृत्ति वाले डंकिंग सोना (Gold)र प्रदर्शित किये गए. झांकी के दूसरे भाग में डी4 काउंटर ड्रोन सिस्टम के साथ लैंड सर्विलांस, कम्युनिकेशन और न्यूट्रलाइजिंग प्लेटफॉर्म दिखाई दिए, जो रियल टाइम सर्च, डिटेक्शन, ट्रैकिंग और लक्ष्यों को बेअसर कर सकते हैं. क्विक रिएक्शन सरफेस टू एयर मिसाइल (क्यूआरएसएएम), बैटरी मल्टी फंक्शन राडार और मिसाइल लॉन्चर व्हीकल की दो इकाइयां भी झांकी में प्रदर्शित की गईं. क्यूआरएसएएम वायु-रक्षा प्रणाली सामरिक युद्ध क्षेत्र में भारतीय सेना को मोबाइल हवाई रक्षा कवर प्रदान करती है.

इसके अलावा सॉफ्टवेयर डिफाइंड रेडियो के दो संस्करण मैनपैक और हैंडहेल्ड भी इस झांकी का हिस्सा बने. डीआरडीओ ने सुरक्षित संचार के लिए सॉफ्टवेयर डिफाइंड रेडियो विकसित किया है. झांकी के तीसरे भाग में एरियल सर्विलांस एंड कम्युनिकेशन प्लेटफॉर्म एयरबोर्न अर्ली वार्निंग एंड कंट्रोल सिस्टम (एईडब्ल्यूएंडसी) और तापस मीडियम एल्टीट्यूड लॉन्ग एंड्योरेंस को प्रदर्शित किया गया.

झांकी के चौथे भाग ने डीआरडीओ की अनुसंधान गतिविधियों का प्रतिनिधित्व किया, जिसमें सेमीकंडक्टर आरएंडडी सुविधा का प्रदर्शन किया गया. इस भाग में डीआरडीओ ने सेमी-कंडक्टर,

डिटेक्टर और नेक्स्ट जेन सेंसर के क्षेत्र में भविष्य की तकनीकों को भी दर्शाया. स्वदेशी रूप से विकसित व्हील्ड आर्मर्ड प्लेटफॉर्म भी प्रदर्शित किये गए, जिसे 70 टन के ट्रेलर पर ले जाया जाता है. परेड के दौरान अर्जुन एमबीटी, नाग मिसाइल सिस्टम, ब्रह्मोस मिसाइल, शॉर्ट स्पैन ब्रिज और आकाश एनजी का भी प्रदर्शन किया गया.

https://udaipurkiran.in/hindi/drdo-showcases-radar-systems-to-neutralize-security-threats/

THE TIMES OF INDIA

Thu, 26 Jan 2023

Soldiers at 'Geo-Strategic' Areas: DRDO Turns to Startups, Academia for Key Tech

The Defence Research and Development Organisation (DRDO), India's lead defence research agency tasked with equipping the armed forces, is looking at a variety of new technologies to help prepare soldiers for multiple "geo-strategic" locations — ranging from high-humidity conditions to areas requiring anti-freeze equipment. And for this, the premier agency has turned to startups and academia for at least 21 such technologies. Internally, its Defence Research Laboratory (DRL) will lead the development activity. From apparel material that can prevent snake bites to formulations that can be used as alternatives to bathing or oral hygiene and from database on wild-edibles for emergency survival and real-time offline translation tools, startups and academia have been invited to participate in cutting-edge R&D.

According to DRL, a DRDO lab specialising in R&D of products and technologies for soldier support, protection, and emergency survival, academia, startups, institutions "can team-up with DRL for these cutting-edge targeted R&D in highly challenging areas of military research and be part of India's national self-reliance mission".

It adds that the list of 21 technologies/products is not "exhaustive" and that there would be "ample scope for dialogue on other novel ideas, products, technologies and knowledge" relevant to soldier support, protection and survival under emergency conditions. Experts and former armed forces officers TOI spoke with said that while some of these products are currently being used by soldiers but are imported, several others will be useful. They, however, reiterated that unless these technologies or products are delivered within a stringent timeline their benefits could be offset.

Former DGMO (director general of military operations) and 15 Corps commander Lt Gen (retd) AK Bhat told TOI: "I would differentiate some of these as "essential", some as "could be" some as aspirational technologies and products. For instance, technologies to protect soldiers at high-altitude and cold areas like Siachen are absolutely necessary as we will be working there more. It is a welcome move that the DRDO is working with startups and industries, which would help in achieving timelines and is in line with self-reliance."

https://timesofindia.indiatimes.com/city/bengaluru/soldiers-at-geo-strategic-areas-drdo-turns-to-startups-academia-for-key-tech/articleshow/97336223.cms

Defence News

Defence Strategic : National/International

Thu, 26 Jan 2023

Made-in-India Weapons Systems Flaunted at 74th Republic Day Parade

As India celebrated its 74th Republic Day today, Kartavya Path in the national capital witnessed the prowess of the armed forces armoured with hi-tech indigenously made equipment. The Republic Parade 2023 kicked off with a march by a contingent of the Egyptian Armed Forces. The first contingent in the uniform of the 61 Cavalry was led by Captain Raizada Shaurya Bali. The 61 Cavalry is the only serving active Horse Cavalry Regiment in the world, with the amalgamation of all the 'State Horse Units'.

The Indian Armed Forces has been rendering its selfless service to the nation and its countrymen, ensuring stability and dominance on the frontiers along the Line of Control (LoC), the Line of Actual Control (LAC) and worldwide through UN Peacekeeping missions.

Indian Army's Lethality, Accuracy and Reliability witnessed a leap with the acquisition of platforms like Akash Missile System, satellites, Modular Bridges, towed guns, utility helicopters, electronic warfare system and the likes of surface-to-air missiles.

This year, only Made-in-India weapon systems were showcased at the Republic Day parade including ammunition showcased India's indigenization power, including 21 Gun Salute through 'Made in India' 105 mm Indian Field Guns, recently inducted LCH Prachand, the K-9 Vajra howitzers, MBT Arjun, Nag anti-tank guided missiles, Akash air defence missiles, and the Quick Reaction Fighting Vehicles.

MBT Arjun

ARJUN of 75 Armoured Regiment was led by Captain Amanjeet Singh. MBT ARJUN', is third generation main battle tank developed indigenously by India's Defence Research and Development Organisation (DRDO).

Arjun features a 120 mm main rifled gun, 7.62 mm coaxial machine gun and a 12.7 mm anti-aircraft machine gun. It is powered by a 1400 HP Diesel engine and can achieve a maximum speed of 70 km/h (43 mph) and a cross-country speed of 40 km/h (25 mph). The newly developed Kanchan armour provides an all-around anti-tank warhead protection, much higher than available in comparable third-generation tanks. Its motto is motto 'Sahasam Vijayate'.

Nag Missile System (NAMIS)

The next detachment was of NAG Missile System of 17 Mechanised Infantry Regiment led by Lt Siddhartha Tyagi. The System popularly called NAMIS is a tank destroyer indigenously designed by the Defence Research & Development Laboratory Hyderabad, a lab of DRDO. It consists of a tracked Armoured Fighting Vehicle, which has a crew-less turret capable of firing six 'Nag' Anti-Tank Guided Missiles. NAMIS has been developed for the Recce and Support units of the Mechanised infantry to reinforce and enhance anti-tank capability along our borders during offensive and defensive operations.

The Nag missile is a Fire & Forget ATGM with an effective range of 5 km. The tandem warhead with the capability to lock-on- before launch and top-attack, accurately hits the targets that are moving or trying to escape.

NAMIS is a game-changer and the successful development of this modern weapon system for the Indian Army has propelled India into the select club of countries which have developed their own fire-and-forget top-attack tactical ATGMs integrated on AFVs. Its motto is 'Satrah Mech - Har Maidan Fateh'.

BMP2/2 K

Next came to the saluting dais was the mechanised column of Infantry Combat Vehicle BMP-2 of Mechanised Infantry Regimental centre led by Captain Arjun Sidhu of 6 Mechanised Infantry Regiment.

ICV BMP-2 named SARATH, is a high mobility Infantry Combat Vehicle (ICV) which possesses lethal weapons and night fighting capability. It can operate effectively in all battlefield terrains of desert, mountainous region or high-altitude area. Its motto is 'Valour and Faith' which means (Veerta our Vishwas').

Quick Reaction Fighting Vehicle (QRFV)

The next detachment was of Quick Reaction Fighting Vehicle led by Captain Naveen Dhatterwal of the 3 Ladakh Scouts Regiment. These vehicles under Atma Nirbhar Bharat Scheme are being manufactured by TATA Advance System and Bharat Forge Limited for the Indian Army and is shining example of Indian Army's quest for self-reliance. This 4x4 wheeled Armoured Platform has full Armour Protection with a 360 Degree Turret which mounts a 7.62mm Medium Machine Gun, can carry 10 Fully Armed Troops. The vehicle is ideally designed for troops operating in Ladakh, Sikkim and Arunachal Pradesh.

The vehicle is also Mine and Bullet Proof which makes it suited as an Escort vehicle and special response for CI OPS. It has a maximum speed of 80 km/h with an OP range up to 600 km and can negotiate a gradient up to 25 degrees. The War Cry is "Ki Ki So So Lahargyalo" which means 'Victory to God.

K-9 Vajra-T (SP)

The next detachment was of K9 Vajra-T of 224 Medium Regiment (Self Propelled) led by Lt Prakhar Tiwari. K9 Vajra-T 155mm/52 Calibre Tracked Self Propelled has a firing range of 40 Kms. The Tracked Self Propelled Gun System can move at a maximum speed of 60 km/hr over arid desert terrain. It has been provided with all welded steel armour protection & the design incorporates Modular Azimuth Position System (MAPS) and Automatic Fire Control System. Its motto is Sarvada Sarva Pratham' which means 'Always the First'.

Brahmos

The next detachment was of Brahmos of 861 Missile Regiment led by Lieutenant Prajjwal Kala. BRAHMOS is a supersonic, high-precision, cruise missile having a range of 400 km with the capability to strike targets deep inside the enemy territory with precision and devastating effect. Its motto is "Swamiye Sarnam Aiyyapa".

10m Short Span Bridge

The 10m Short Span Bridge of 64 Assault Engineer Regiment led by Captain Shivashish Solanki, it is a mechanically launched Assault Bridge designed by DRDO to help Combat Engineers in Crossing formidable obstacles like Canal or Nallahs in a matter of minutes. The motto of 10 metres Short Span Bridge System was Agrani Ajay' which means 'Always Leading and Unconquerable.

These Bridges can be utilized by mechanised and armoured columns to speedily cross obstacles and destroy the enemy. These indigenous bridges signify that no obstacles remain impediments to the Mechanised

Forces of the Indian Army and are a step forward to Atmanirbharta in defence. The Regiment will celebrate 50 years of glorious history on 30 Sept 2023.

Mobile Microwave Node and Mobile Network Centre

Mobile Microwave Node and Mobile Network Centre of Corps of Signals was led by Major Mohd Asif Ahmed of 2 AHQ Signal Regiment with a motto of 'Teevra Chaukas' which means 'Swift and Secure? The column consists of two vehicles, a 'Mobile Microwave Node' and 'Mobile Network Centre Major Mahima Kataria of 2 AHQ Signal Regiment in charge of the Mobile Network Centre. The Mobile Microwave Node of the Indian Army is capable of extending high-speed operational communications to Tactical Battle Area.

The Node is mounted on a High Mobility Vehicle platform and housed in an NBC proof ruggedised shelter to provide matching mobility and sustenance to mobile mechanised operations. The vehicle can operate on optical, microwave and satellite media to provide triple play services to include voice, data and video to field formations in active hostilities.

The Mobile Network Centre is a next-generation network vehicle and enabler of network-centric operations.It hosts three core functionalities of Network Operations, Security Operations and the Data Centre. It acts as a force multiplier by enhancing battlefield transparency and increasing situational awareness. The vehicle has a crew of six led by an officer and is equipped with IMS core, aggregation routers access switches, large screen displays and high-speed processing platforms. The mobile node is developed indigenously and upholds the Aatmanirbhar Bharat Mission.

The next detachment is of AKASH weapon System of 27 Air Defence Missile Regiment -- 'the Amritsar Airfield', led by Captain Sunil Dasharathe accompanied by Lt Chetana Sharma of 512 Light AD Missile Regiment (SP).

Akash Weapon System is the first indigenously developed Air Defence System capable of firing Short Range Surface to Air Missile (SR-SAM), against enemy aerial platforms. Its motto is "Akaash-e-Shtrun Jahi". In the sky two Dhruv Helicopters and two Rudra Helicopters integrated with weapon systems demonstrated their power dominance. The Advanced Light Helicopters, Rudra, are also referred to as flying tanks. The Rudra formation was led by Colonel R S Jamwal, Sena Medal of 205 Army Aviation Squadron (UH) with National Flag, followed by Lt Col Sumit

Kumar Uniyal and Lt Col Puneet in two Rudra helicopters and Lt Col Vijayat Goyat in the last Dhruv helicopter.

Wheeled Armoured Platform - WHAP 8x8 on 70 ton trailer

Wheeled Armoured Personnel Carrier, WhAP 8x8, carried on a specialist 70-ton Trailer are indigenously designed and developed by DRDO.

WhAP is a modular, 8x8 wheeled combat platform. WhAP is a state-of-the-art customisable platform for roles such as Infantry Vehicle, CBRN Vehicle, ATGM carrier etc. The Armoured Personnel Carrier variant on display is integrated with 30mm turret, composite armour and innovative blast protection. This amphibious vehicle can cross rivers and canals and its maximum on-road speed is 100 km/h.

The 70-ton trailer is equipped with state-of-the-art hydraulic suspension for better mobility, steerable axles and hydraulic ramp for ease of loading and unloading of heavy payloads. The trailer which is capable of negotiating sharp turns and gradients has undergone extensive trials with MBT Arjun as payload.

Notably, the Defence Services witnessed path-breaking reforms to transform the military into a modern, self-reliant, youthful and tech-savvy force. The seamless modernization plan focused upon developing 'Force Capabilities', the creation of Self Reliant Defence ecosystem with Make in India pursuit and a learner and agile Army driven by technology.

https://www.ndtv.com/india-news/made-in-india-weapons-systems-flaunted-at-74th-republic-day-parade-3725747

The Tribune

Thu, 26 Jan 2023

Indian 105-mm Field Guns Replace Vintage 25-Pounders for 21-Gun Salute During 74th R-Day Parade

The ceremonial 21-gun salute during the 74th Republic Day celebrations at Kartavya Path was fired by 105-mm Indian field guns as they replaced the vintage artillery with 25-pounder guns that traditionally did the thundering salute. Associated with the 2281 Field Regiment, seven 1940-era cannons formed the part of the artillery that had been firing the ceremonial salute during the Republic Day celebrations on Rajpath (now Kartavya Path).

Made in the United Kingdom, these vintage guns had participated in the World War II, according to sources. India's military prowess and cultural heritage was displayed during the parade that started around 10:30 AM and ended close to noon time after a fly past. As per tradition, the national flag was unfurled followed by the National Anthem with a booming 21-gun salute. The ceremonial salute was given with 105-mm Indian field guns. "The iconic 21 Gun Salute….For the first time ever, the Gunners of 8711 Field Battery (Ceremonial) presented the traditional 21

#GunSalute by the indigenously made 105 mm Indian Field Guns #IFG on the occasion of #RepublicDay23. #IndianArmy #OnPathToTransformation," the Army tweeted. It also shared a few pictures of the indigenously-made IFGs on Twitter. The duration of the ceremonial 21-Gun Salute coincides with the length of the National Anthem.

Chief of Staff Delhi Area Maj Gen Bhavnish Kumar at a press interaction on January 23 had said that this year the 21-Gun Salute will be fired by the 105 mm Indian field guns replacing the 25-pounders. The defence ministry on Wednesday had said the IFGs will replace the vintage 25-pounder guns, reflecting upon the growing 'Aatmanirbharta' (self-reliance) in defence. During a press interaction here on Monday, Chief of Staff Delhi Area Maj Gen Bhavnish Kumar said, "We are transitioning towards indigenisation" and the "time is not far when all are equipment will be 'swadeshi'". All equipment from the Army that will be showcased during the 74th Republic Day celebrations are made-in-India, he had said. "This year the 21-Gun Salute will be fired by the 105 mm Indian field guns replacing the 25-pounders," he had said.

During the 2017 R-day ceremony, a senior Army official had told PTI that each 25-pounder gun is handled by a team of three personnel, "and ideally all seven fire in a cyclical fashion until the 21st round is fired when hay of ...jay jay hay is being sung or played".

Asked about the reason behind the move of replacing the 25-pounders, Maj Gen Kumar said, "Since the 105-mm Indian Field Gun is an indigenised gun, so we want to use this to replace the 25-pounder guns used earlier for the 21-Gun Salute. And, it is a matter of pride that we are showcasing our indigenous gun for this too". The 105 IFG (Indian Field Gun) was designed in 1972. The Gun Carriage factory, Jabalpur and Field Gun Factory, Kanpur, manufacture it. They are in service since 1984, he said. These field guns are compact light and they can also be airdropped. It is a very good Indian gun, Maj Gen Kumar said.

Army sources said these guns (25-pounders) are "obsolete and phased out of the Army now. And, presently being used as warm trophies in various army establishments like the Artillery Centre, etc".

https://www.tribuneindia.com/news/nation/indian-105-mm-field-guns-replace-vintage-25-pounders-for-21-gun-salute-during-74th-r-day-parade-473980

नवभारत टाइम्स

Wed, 25 Jan 2023

यूक्रेन युद्ध में फेल हुआ तो रूसी टी-72 को भारत ने किया अपग्रेड, हाहाकारी बन गया हाइब्रिड टैंक

भारत अब अपनी बारी का इंतजार नहीं कर रहा, दूसरों के अनुभवों से भी सीखकर नई जरूरतें पूरा करने की दिशा में तेज कदम बढ़ा रहा है। धूर्त पड़ोसी चीन की संभावित साजिशों से निपटने के लिए भारत अपनी रक्षा तैयारियां लगातार तेज कर रहा है। रक्षा क्षेत्र में भारत की तत्परता का आलम यह है कि यूक्रेन युद्ध से सीखकर अपने टैंकों को अपग्रेड करने का फैसला कर लिया है। यूक्रेन पर हमले में रूसी टैंक कारगर साबित नहीं हो रहे हैं। इसलिए भारत चौकन्ना हो गया है क्योंकि हमारे पास भी वही रूसी टैंक हैं।

यूक्रेन युद्ध में रूसी टैंकों की दुर्गति से भारत ने ली सीख

भारतीय सेना ने रूसी टैंक के अपने बेड़े को विध्वंसक बनाने के लिए इसे अपग्रेड करने का फैसला लिया है। इसके मुताबिक अब दो घातक टैंकों टी-72 और टी-90 की खासियतों के आधार पर सेना के टैंकों को अपग्रेड किया जाएगा। अभी भारतीय सेना के पास टी-72 मेन बैटल टैंक (MBT) है। यूक्रेन में इसकी दुर्गति देखकर भारतीय सेना ने इसे नई टेक्नॉलजी से लैस करने का फैसला किया है ताकि इसकी मारक क्षमता बढ़ाई जा सके।

भारत ने बना लिया टी-72 और टी-90 टैंकों का हाइब्रिड

भारतीय सेना टैंकों को अपग्रेड करके अपने बेड़े को आधुनिक युग के युद्धों के मुताबिक बनाना चाहती है। चूंकि यूक्रेन युद्ध के दौरान रूसी टैकों का प्रदर्शन उत्साहजनक नहीं रहा है, इसलिए भारतीय सेना एहितयातन टैंकों की क्षमता बढ़ाने की जरूरत महसूस कर रही है। यूक्रेन युद्ध में रूसी टैंक टी-72 उम्मीद पर खरा नहीं उतरा। इससे सबक लेकर रूस ने अपने टी-90 टैंक को भी अडवांस बनाने की प्रेरणा ली। रूस अब यूक्रेन के खिलाफ युद्ध में निर्णायक फैसले पर पहुंचने की तैयारियों में टैंक का टी-90एम वेरियेंट डेवलप कर रहा है।

हाहाकारी हो गया हाइब्रिड टैंक

इधर, भारतीय सेना ने टी-72 टैंक की मेन बॉडी और टी-90 भीष्म के बुर्ज (Turret of T-90 Tank) को मिलाकर नया वर्जन बना ली है। यह हाइब्रिड टैंक टी-72 के मुकाबले ज्यादा घातक साबित हो रहा है। इसमें एक्सप्लोसिव रिएक्टिव आर्मर (ERA) भी लगाया गया है जिसे रक्षा अनुसंधान एवं विकास संगठन (DRDO) ने अर्जुन मेन बैटल टैंक (Arjun MBT) के लिए बनाया था। इस हाइब्रिड टैंक में एटीजीएम भी लगे हैं। नए हाइब्रिड टैंक का परीक्षण हो चुका है और अब कुछ महीनों में इसे सेना में शामिल भी कर लिया जाएगा। फिर इस गर्मी में उसका रेगिस्तान में ट्रायल भी किया जाएगा।

https://navbharattimes.indiatimes.com/india/indian-army-made-hybrid-tank-mixing-t-72-with-t-90-after-russian-tank-underperformed-in-ukaraine-war/articleshow/97304161.cms

Thu, 26 Jan 2023

Budget 2023: Here's how much Govt has Allocated to Defence Sector in Last Five Years

The announcement of the Union Budget for the year 2023-2024 is just a few days away. The Union Finance Minister will table the Union Budget on February 1, 2023. Ahead of the announcement, take a look at how much of the Budget the government has allocated to the Defence sector in the past five years.

India’s Defence sector is strategically important. India has one of the world's largest military forces, with a strength of more than 14.4 lakh active personnel. India’s Defence Budget includes an allocation for the three defence services: Army, Navy and Air Force. The Defence Budget also includes an allocation for the ordnance factories, research and development, and capital outlay.

Take A Look At The Share Of Funds Allocated To Defence Sector In The Union Budget In Last Five Years:

2018-2019

In the year 2018-19, the Ministry of Defence was allocated Rs 4,04,365 crore (including pensions) for expenditure across the various services, production establishments, and research

and development organisations. This comprises 16.6 per cent of the Budget of 2018-19 and 2.2 per cent of India's estimated GDP.

Out of the total funds allocated to Defence Industry, for Defence Pension, an amount of Rs 1,08,853.30 crore was provided. The revised estimates for 2018-19 was Rs 4,05,194 crore.

2019-2020

In 2019-20, the Ministry of Defence was allocated Rs 4,31,011 crore (including pensions) for expenditure across various services, production establishments, and research and development organisations. This was about 15.47 per cent of the central government's Budget for 2019-20 and 2 per cent of India's estimated GDP. The revised estimates for 2019-20 was Rs. 4,48,820 crore.

The Budgeted estimates for 2019-20 grew by 6.4 per cent over the revised estimates of 2018-19. The increase was the highest for the capital outlay component. Out of the total funds allocated to Defence Industry, for Defence Pension, an amount of Rs 1,12,079.57 crore was provided.

2020-2021

In 2020-21, the Ministry of Defence was allocated Rs 4,71,378 crore. This includes expenditure for salaries of armed forces and civilians, pensions, modernisation of armed forces, production establishments, maintenance and research and development organisations. Out of the total funds allocated to Defence Industry, for Defence Pension, an amount of Rs 1,33,825 crore. The revised estimates for 2020-21 was Rs 4,84,736 crore.

The expenditure on defence constitutes 15.5 per cent of the central government's Budget and 2.1 per cent of India's estimated GDP for 2020-21. The Budgeted Estimates for 2020-21 grew by 5 per cent over the revised estimates of 2019-20. The increase was the highest for defence pensions.

2021-2022

In 2021-22, the Ministry of Defence was allocated Rs 4,78,196 crore. This includes expenditure on salaries of armed forces and civilians, pensions, modernisation of armed forces, production establishments, maintenance, and research and development organisations. Out of the total funds allocated to Defence Industry, for Defence Pension, an amount of Rs 1,15,850 crore. The revised estimates for 2021-22 was Rs 5,02,884 crore.

In 2021-22, expenditure on salaries and pensions had the largest share of the defence Budget (Rs 2,58,628 crore, constituting 54 per cent of the defence Budget). Capital outlay of Rs 1,28,150 crore, formed 27 per cent of the Defence Budget.

2022-2023

In the year 2022-23, the Ministry of Defence was allocated a total Budget of Rs 5, 25,166 crores, which is 13.31 per cent of the total Budget. This included an amount of Rs 1.19 lakh crore for Defence Pensions. Total allocation under Capital Outlay of Defence Services enhanced to 1.52 lakh crore

In a major announcement during her Budget speech, Nirmala Sitharaman said that To reduce imports and promote self-reliance, the Budget for 2022-23 proposed that 68 per cent of the defence capital procurement Budget will be earmarked for the domestic industry. This increased from 58 per cent in 2021-22.

https://news.abplive.com/business/budget/budget-2023-union-budget-2023-india-budget-2023-union-budget-2023-news-nirmala-sitharaman-defence-sector-1577841

FINANCIAL EXPRESS
Read to Lead

Wed, 25 Jan 2023

Indian Army Looks for Jet Pack Suits; Defence Ministry Issues RFP for Made-In-India Content

The Ministry of Defence (MoD) has issued a Request For Proposal (RFP) for 48 Jet Pack suits. The RFP is being made as an emergency procurement through the Fast Track Procedure (FTP) under the Buy Indian Category. The indigenous content requirement is greater or equal to 60% if it has at least 50% indigenous design. The RFP highlights that the Jet Packs will be delivered at COD Agra. The warranty period is three years after completing the Joint Receipt Inspection (JRI), while the CMC is five years after the three-year warranty. The Earnest Money Deposit (EMD) amount is Rs 70 lakh. January 27 is the last day to submit pre-bid queries, while the date and time of the pre-bid meeting are on 31 January 2023. The later date to submit the bid as stipulated in the RFP is February 7

The RFP states that the government has invited responses only from Original Equipment Manufacturers (OEM) or Authorised Vendors or Government Sponsored Export Agencies (applicable in the case of countries where domestic laws do not permit direct export by OEM). The end users of these Jet Pack suits are the Indian Armed Forces.

The service life and shelf life should be at least a decade for these Jet Pack suits. “The Bidder is required to give details of the reliability model, reliability prediction and its validation by designer/manufacturer to ensure the reliability of stores throughout Service/shelf life. The efficacy of the reliability model/prediction/validation would be verified during technical and environmental evaluation,” the RFP highlights. The RFP highlights the training of the crew as required, “A training package for the exercise of operators and operator trainers to undertake the

operation of equipment and training of quality assurance personnel for QA of equipment would be required to be carried out in English language and in Hindi if needed. This training shall give the operators the necessary knowledge and skills to operate. The block, the syllabus and details of the movement to be conducted are to be decided by the Directorate General of Infantry (Inf-7) and the vendor.

The bidder will define the syllabus in consultation with the Buyer at the time of the Contract Negotiation Committee (CNC). All training requirements such as training aids, projection system, complete equipment with accessories/options, technical literature, spares, test equipment/test set-up, charts, training handouts, powerpoint presentations, computer-based training (CBT), documentation, simulators etc. will be catered by the bidder."

The bidder is expected to demonstrate the jetpack suit on a "No Cost, No Commitment" basis with one unit. The technical specifications are as follows: the system's total weight (excluding the human) must not exceed 40 kilograms. It must have features for a safe take-off, flight and landing post-training of the user.

The jet pack suit should have a modern propulsion system, including turbine engines/electric and hybrid systems. The maximum speed should be at least 50 kilometres per hour. The payload capacity should be at least 80 Kg. The jet pack's flight time should be eight minutes of flight time.

The jet pack suits should be capable of operating in temperatures ranging between a minimum of -150C to -100C and a maximum between 400C to 450C. The operational altitude should be up to 3000 meters. The equipment should operate satisfactorily in plains, mountains, deserts and high-altitude areas up to 3000m.

The suit should be capable of being stored in weatherproof packages and be capable of being transported by land, sea or air as required. The equipment should have adequate securing straps on the body for safe flight. The jet pack should preferably be black and have a helmet of suitable safety standards.

https://www.financialexpress.com/defence/indian-army-looks-for-jet-pack-suits-defence-ministry-issues-rfp-for-made-in-india-content/2959872/

नवभारत टाइम्स

Thu, 26 Jan 2023

इंडियन आर्मी को मिलेंगे 6 अपाचे

पहले अपाचे अटैक हेलिकॉप्टर की डिलिवरी फरवरी 2024 में

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■ **नई दिल्ली :** सेना को अगले साल 6 अपाचे हेलिकॉप्टर मिल जाएंगे। पहला अपाचे हेलिकॉप्टर फरवरी 2024 में डिलिवर होगा। अपाचे अटैक हेलिकॉप्टर पर आर्मी एविएशन के पायलट और टेक्निशियंस की ट्रेनिंग पिछले साल दिसंबर से शुरू हो गई है। फरवरी 2024 में पहले अपाचे हेलिकॉप्टर की डिलिवरी के बाद अगले तीन महीने में सभी 6 अपाचे आर्मी को मिल जाएंगे। अभी अमेरिका में इंडियन आर्मी एविएशन के चार पायलट और सात टेक्निशियंस की ट्रेनिंग चल रही है।

आर्मी एविएशन कुछ वक्त पहले तक यूटिलिटी हेलिकॉप्टर ही ऑपरेट करती रही है लेकिन हाल ही में आर्मी एविशन को स्वदेशी लाइट कॉम्बैट हेलिकॉप्टर भी मिले हैं। यह आर्मी एविएशन को मिले पहले अटैक हेलिकॉप्टर हैं। लाइट कॉम्बैट हेलिकॉप्टर की पहली स्क्वॉड्रन को पिछले साल नंबर में ईस्टर्न सेक्टर में लाइन ऑफ एक्चुअल कंट्रोल के पास मीसामारी में तैनात किया गया है। आर्मी के लिए 6 अपाचे हेलिकॉप्टर की डील फरवरी 2020 में साइन हुई थी। कैबिनेट कमिटी ने अमेरिका से 39 अपाचे हेलिकॉप्टर लेने को स्वीकृति दी थी। इसके बाद इंडियन एयरफोर्स के लिए 22 अपाचे हेलिकॉप्टर लेने की डील सितंबर 2015 में साइन हुई। सरकार ने तय किया कि अब जो भी अपाचे हेलिकॉप्टर की खरीद होगी वह आर्मी के पास जाएंगे। एयरफोर्स को सभी 22 अपाचे अटैक हेलिकॉप्टर मिल गए हैं।

अभी मिले हैं स्वदेशी लाइट कॉम्बैट हेलिकॉप्टर

इसकी आखिरी खेप में पांच हेलिकॉप्टर आए जो जुलाई 2020 में आए। उस वक्त ईस्टर्न लद्दाख में लाइन ऑफ एक्चुअल कंट्रोल पर भारत चीन के बाद तनाव चरम पर था। एयरफोर्स के सभी 22 अपाचे हेलिकॉप्टर ऑपरेशनल रेडी हैं और ईस्टर्न लद्दाख में भी तैनात हैं। चीन के साथ तनाव के बीच अपाचे हेलिकॉप्टर वहां लगातार उड़ान भी भर रहे थे।

आर्मी के लिए 6 अपाचे लेने की डील करीब 800 मिलियन डॉलर में साइन हुई। अपाचे अटैक हेलिकॉप्टर दुनिया के सबसे आधुनिक और घातक हेलिकॉप्टर माने जाते हैं। अमेरिका ने खुद अपाचे अटैक हेलिकॉप्टर का इस्तेमाल पनामा से लेकर अफगानिस्तान और इराक तक में किया। अपाचे अटैक हेलिकॉप्टर में दो जनरल इलैक्ट्रिक T700 टर्बोशैफ्ट इंजन हैं और आगे की तरफ एक सेंसर फिट है जिससे यह अंधेरे में भी उड़ान भर सकता है।

THE TIMES OF INDIA

Thu, 26 Jan 2023

Invent in India: India's Defence Tech Indigenisation should be via an Ecosystem Involving Companies, Universities, IITs

Editorial

Yesterday's R-Day parade had all the usual display of military hardware – with one difference, there was a fair number of India-manufactured weapons. Arjun MK-1 main battle tank, K-9 Vajra self-propelled howitzer, BrahMos and Nag missiles and choppers. India isn't and should never be a nation-state that seeks war. But India's neighbourhood isn't a peaceful one. So, while seeking peace, it has to muscle up militarily, and indigenisation is the best way to do that. Having largely relied on foreign defence platforms over the years, the belated indigenisation push is certainly welcome. Roughly 60% of India's defence hardware is of Russian origin. And the Ukraine war has thoroughly exposed this outdated 'Potemkin arsenal'.

GoI's four positive indigenisation lists – more than 400 defence items that have to be procured domestically – are a good start. However, the country is still confronted with gaps in indigenous development capabilities for high-tech platforms. For example, even the import content for the indigenous Tejas fighter continues to be around 50%. Therefore, the focus now ought to be on increasing the level of indigenisation. That can happen only through ramping up the quality of R&D. This is where civilian and defence R&D can create a mutually reinforcing technology ecosystem. Many of the world's widely used products and services have military-civilian dual applications. The internet, space rockets, GPS and radar are merely the most famous examples. Microwaves, canned food, duct tape, aviator sunglasses, synthetic rubber tyres, freeze-drying – and many more are results of defence-related research. Drones are the latest example of military research changing civilian life. Defence research has even had an enormous impact on healthcare. Blood transfusion, EpiPens and even the basic concept of ambulances originated in the needs of armed forces.

India's large defence needs and fiscal support for domestic weapons systems are a starting point. GoI must help create a network of big companies that can manufacture weapon systems and components, technology entrepreneurs who will experiment with new tech and IITs and the better universities that can provide talented young researchers and scientists. This is doable, if GoI thinks creatively.

https://timesofindia.indiatimes.com/blogs/toi-editorials/invent-in-india-indias-defence-tech-indigenisation-should-be-via-an-ecosystem-involving-companies-universities-iits/

THE HINDU

Wed, 25 Jan 2023

412 Gallantry Awards and other Defence Honours Announced Ahead of R-Day

President of India Droupadi Murmu has approved 412 gallantry awards and other defence decorations to armed forces personnel and others on the eve of the 74th Republic Day. Major Shubhang and Naik Jitendra Singh will receive the Kirti Chakra while Cdr Nishant Singh from the Navy, who lost his life in a MiG-29K fighter crash, will be remembered with the Nao Sena Medal (Gallantry). The awards include six Kirti Chakras (four posthumous), 15 Shaurya Chakras (two posthumous), 93 Sena Medals (Gallantry) (four posthumous), one Nao Sena Medal (Gallantry) posthumous, seven Vayu Sena Medals (Gallantry), 29 Param Vishisht Seva Medals (PVSM), three Uttam Yudh Seva Medals (UYSM), 53 Ati Vishisht Seva Medals (AVSM), 10 Yudh Seva Medals (YSM), 40 Sena Medals (Devotion to Duty), 13 Nao Sena Medals (Devotion to Duty) (five of them posthumous), 14 Vayu Sena Medals (Devotion to Duty) and 128 Vishisht Seva Medals (VSM).

Two of the Kirti Chakras and seven of the Shaurya Chakras were for Army personnel. The President has also awarded one President's Tatrakshak Medal (Distinguished Service), three Tatrakshak Medal (Gallantry) and Tatrakshak Medal (Meritorious Service) to Indian Coast Guard personnel.

Defence Minister Rajnath Singh has approved 62 Mentioned in Despatches to armed forces personnel. These include 55 Chief of Army Staff Recommendations: 27 for Operation Rakshak, 13 for Operation Snow Leopard, two for Operation Orchid, six for Operation Rhino, one for Operation Nongkee and six others. This also includes seven Chief of Air Staff Recommendations.

Major Shubhang is from the Dogra Regiment and was with 62 Rashtriya Rifles (RR) and Naik Jitendra Singh is from Rajput Regiment and with 44 RR. Their awards will recognise counterinsurgency operations in Kashmir. Major Shubhang led his team through inhospitable, rugged and thickly vegetated terrain in extreme weather conditions in Budgam district in April 2022. Major Shubhang's citation said the he displayed nerves of steel to allow suspects to reach as close as ten meters, before challenging them. Terrorists opened fire and an Under Barrel Grenade Launcher fire had injured the officer and two personnel of his team. "Undeterred, Major Shubhang exhibited unparalleled valour despite sustaining gunshot wound on left shoulder and neutralised a hardcore terrorist in an intense extremely close quarters firefight." Naik Singh's citation praised his indomitable spirit, exemplary initiative and supreme bravery in neutralising a hardcore terrorist and injuring another in an operation on April 27, 2022 in Pulwama district.

"Realising mortal danger to his buddy and troops in cordon, Naik Singh, displaying supreme gallantry, crawled towards the terrorist and injured him in another close gunfight. Subsequently, he fell unconscious and was evacuated to 92 Base Hospital," his citation stated.

The Shaurya Chakras were awarded to Major Aditya Bhadauria from the Kumaon Regiment and with 50 RR, Captain Arun Kumar from the Kumaon Regiment and with 13 RR, Captain Yudhvir Singh from the Mechanised Infantry and with 09 RR, Captain Rakesh T.R. from 9 Para Special Forces and Lance Naik Vikas Choudhary with Jammu and Kashmir Rifles and with 3 RR. The honours also went to Naik Jasbir Singh from 9 Jammu and Kashmir Rifles and Constable Mudasir Ahmad Sheikh with Jammu and Kashmir police posthumously.

https://www.thehindu.com/news/national/412-gallantry-awards-and-other-defence-honours-announced-ahead-of-r-day/article66433364.ece

THE HINDU

Wed, 25 Jan 2023

Indian-made Scorpène-class 'Silent Killer' Submarine INS Vagir

By Sumeda

The story so far: INS Vagir, the fifth of the Kalvari-class submarines under Project-75, has been commissioned into the Indian Navy at a time when China is making forays into the strategically important Indian Ocean region. The submarine has been built indigenously by Mazagon Dock Shipbuilders Limited (MDL) and designed by French naval defence company Naval Group (formerly known as DCNS) as part of the Indian Navy's Project-75. While four of the Kalvari-class submarines have already been commissioned, the last is likely to join the fleet by 2024.

INS Vagir takes its name from the sand shark, a deep-sea predator endemic to the Indian Ocean. It will form part of the Western Naval Command's submarine fleet. As per the Ministry of Defence, the submarine's induction will boost the capabilities of the armed forces, enabling them to further the maritime interests of the country in deterring the enemy, and conducting intelligence, surveillance and reconnaissance (ISR) to provide decisive blows in times of crisis.

What are Scorpène-class submarines?

In October 2005, India signed a $3.75-billion deal as part of Project-75 for the indigenous construction of six diesel-electric attack submarines in collaboration with the Naval Group of France— for the transfer of technology of its Scorpène-class. One of the most advanced conventional submarines, referred to as the "most silent underwater killer machines" in the world, Scorpène-class submarines are equipped with potent weapons and sensors to neutralise

threats above or below the sea. France's Naval Group says that the third-generation air-independent propulsion (AIP) system and stealth and autonomous features of the Scorpène class give the submarine 18 days of autonomy at sea. These submarines are capable of missions related to combat against surface ships and submarines, intelligence gathering, and special operations, and can operate both in the open sea and shallow waters.

The six Scorpène-class submarines of P75 have been designed to operate in all theatres and undertake missions involving anti-surface warfare, anti-submarine warfare, intelligence gathering, mine-laying and area surveillance. They also have a SONAR suite and sensor suite.

The modern technology used in Scorpène submarines ensures superior stealth features such as advanced acoustic absorption techniques, low radiated noise levels, a hydro-dynamically optimised shape , and the ability to launch a crippling attack on the enemy using precision-guided weapons, according to a government press release. "The attack can be launched with both torpedoes and tube-launched anti-ship missiles, whilst underwater or on the surface. The stealth of this potent platform is enhanced by the special attention provided to her characteristic underwater signatures," it adds.

What are Kalvari-class submarines?

The six submarines were to be delivered between 2010 and 2015, but the project faced several delays, including procedural issues in the procurement of equipment required to build submarines and a massive data leak in 2016. It was only in 2017 that the first submarine, INS Kalvari, was commissioned into service.

The second submarine, INS Khanderi, was inducted into the Navy's fleet in September 2019, while the third and fourth, INS Karanj and INS Vela, were commissioned in 2021. INS Vagsheer, the last of the six Scorpène-class submarines after INS Vagir, was launched into the water in April 2022. It is expected to be delivered to the Indian Navy in 2024.

What is special about INS Vagir?

The fifth Kalvari-class submarine is a reincarnation of its earlier version, which was in service for over three decades. It was commissioned in November 1973 and decommissioned in January 2001. In its latest avatar, INS Vagir holds the distinction of the lowest build time among indigenously manufactured submarines and for completing major trials in the shortest span—even winning praise for its feats from Admiral R Hari Kumar, the Chief of Naval Staff. Named after the sand shark to represent the submarine's stealth and fearlessness, qualities the Navy calls synonymous with the ethos of a submariner, INS Vagir was launched in November 2020. Its maiden sea sortie took place in February last year, followed by a series of trials before the submarine was delivered to the Indian Navy in December 2022.

The Navy says that INS Vagir is capable of neutralising a large enemy fleet. The submarine is equipped with advanced sensors and weaponry including wire-guided torpedoes and sub-surface-to-surface missiles. It has a state-of-the-art torpedo decoy system for self-defence and can launch marine commandos for special operations. Its diesel engines can also quickly charge batteries for a stealth mission, as per the Navy.

The armed forces also plan to install an AIP system on all Scorpène submarines to enhance endurance under water. The Defence Research and Development Organisation (DRDO) is in the advanced stages of developing an indigenous AIP module.

Why is the INS Vagir significant?

The Indian Navy began operating submarines in the 1960s. It moved to nuclear submarines within two decades, when it leased a Soviet Charlie-class submarine, named INS Chakra, between 1988 and 1991. As of date, with INS Vagir joining the fleet, the Indian Navy has 16 conventional and one nuclear submarine in service. These include seven Russian Kilo-class submarines, four German HDW submarines, five Scorpène-class submarines, and the nuclear ballistic missile submarine INS Arihant.

Speaking at the commissioning ceremony, Admiral Kumar said that INS Vagir is the third submarine inducted into the Navy in a short span of 24 months. “This is no small achievement and underscores the coming of age of India’s shipbuilding industry and the maturing of our defence ecosystem. It is also a shining testimony to the expertise and experience of our shipyards to construct complex and complicated platforms.”

Another project to build six new-generation stealth submarines with foreign collaboration is in the pipeline. The programme, Project-75 India, is aimed at progressively building indigenous capabilities in the private sector to “design, develop and manufacture complex weapon systems for the future needs of the armed forces”. The project is currently in the request-for-proposal stage.

https://www.thehindu.com/news/national/india-defence-navy-scorpene-submarine-ins-vagir-features-explained/article66423390.ece/amp/

THE HINDU

Thu, 26 Jan 2023

Torpedoing a Submarine Rumour

By Abhijit Singh

Speculation abounds that the Indian Navy could cancel Project-75 I for submarine production and instead acquire more Scorpene (Kalvari class) submarines — the fifth submarine from this

class, INS Vagir, was commissioned into the Navy on January 23. A media report last week claimed that the IN, faced with a single vendor option in Project-75I—with a South Korean company the only bidder in the fray with a proven fuel cell air-independent propulsion (AIP) system — may place a repeat order for Scorpene-class submarines to be built at Mazagon Dock Limited. According to the report, the Navy plans on installing the Defence Research and Development Organisation's still-to-be-developed AIP on the new submarines, impelled in no small measure by the PLA Navy's advance in the Indian Ocean.

There are many things wrong with the report. First, it is based almost entirely on conjecture, seemingly intended to dub Project 75I as impractical and "unviable." There are no indications that the Navy considers the P-75I to be unfeasible. In December 2022, when the Navy Chief, Admiral Hari Kumar, mentioned that the follow-on project for submarines would be cleared by 2023, there were no signs of the Navy's lack of confidence in P-75I. While the Navy has had issues, with many design collaborators withdrawing their tenders for various reasons (design overreach to unrealistic delivery schedules, impractical liability clauses, and rigid technology transfer requirements), there has never been a sense of doom about the project. In fact, German shipbuilder TKMS, which had earlier withdrawn its bid, has even indicated its willingness to remain in the fray, provided the Indian Navy tempers its expectations.

The need for wait and watch

The most difficult of the IN's conditions for foreign collaborators is the requirement that the AIP be a proven system. As stated earlier, except for the South Korean firm Daewoo, no vendor that bid for the P-75I has a proven AIP system. Ironically, the DRDO's AIP is itself unproven. Back in March 2021, the DRDO tested a land-based prototype of the AIP but has reportedly made little progress since. The expectation that the DRDO's AIP will be installed on the first Kalvari-class submarine when it comes in for refit in 2024 is unrealistic given that it has yet to be tried in field conditions. The Navy is reportedly in the process of designating a Kilo-class submarine as a "test bed" for the indigenous AIP, but the process of installation and testing at sea is likely to be protracted.

This is not to suggest that the DRDO AIP is unsuitable for installation in Kalvari-class submarines; it could well prove its worth in years to come. Even so, the Navy would be ill-advised to base a decision on future submarines on the presumption of the DRDO AIP's success. If experience is any guide, DRDO's high claims about technology development ought to be taken with a grain of salt. In particular, the claim that the DRDO AIP prototype underwent 14 days of endurance testing ought to be informed by the reality that the tests were held in simulated underwater conditions. In the circumstances, a wait-and-watch approach is the best way forward for the Navy.

Second, the contention that the cancellation of the P-75I and a repeat order of Project-75 submarines would further 'Aatmanirbhar Bharat' is inaccurate. The Navy's leadership has in the

past acknowledged that the Naval Group, the French company that built the Scorpene-class submarines, transferred insufficient technology during Project 75. While MDL has developed valuable submarine-building expertise—which supporters of a P-75 repeat order rightly argue must be leveraged in future projects—the skills obtained ought to be used in a homegrown project such as the P-75I, where foreign collaborators would be contractually bound to transfer technology in ways that would enable Indian shipbuilders to construct future submarines without external help. A repeat of the Scorpene-class submarines at the altar of the P-75I would mean the abandonment of the strategic partnership model. That is bound to adversely impact the IN's indigenisation initiative. It would also be a blow to the confidence of private shipbuilders, who have invested considerable fiscal and human capital in developing capabilities to build warships and submarines in the hope of contributing to the creation of a defence industrial base.

The issue of battery technology

Third, the claim that lithium-ion batteries are better than AIP—as media reports last week suggested—is flawed. Lithium batteries, while offering better efficiency, power, and charge and discharge dynamics, are unstable and suffer from thermal runaway, fire, and explosion risks. Regardless of the use of lithium batteries in Japan's new submarines, lithium-ion fuel cell technology has still not reached a stage of maturation for the Indian Navy to consider it reliable.

There is also the larger question of whether the DRDO's phosphoric acid fuel cell-based AIP is suitable for Indian submarines. The issue is not as clear-cut as many imagine. PAFC technology is certainly more rugged than other fuel cell types and does offer longer life and efficiency. But PAFC is expensive, complex, and difficult to maintain. Its platinum-coated electrodes experience rapid dissolution, and carbon monoxide produced during the chemical process is known to reduce the overall performance of the system. For that reason, PAFCs are not used for submarine propulsion by any navy in the world. The system's success has so far only been demonstrated in stationary power-generation systems. The only fuel cell technology known to work is the proton exchange membrane (PEM) used in German and South Korean submarines.

This isn't to cast aspersions on India's defence scientists and their efforts to find a solution to the AIP problem in conventional submarines. Their efforts are indeed laudable. The aim of this account is only to point out that speculation in the media that Project 75I is ill-suited for the Navy is tendentious misinformation aimed ostensibly to influence the defence decision-making process. There are no signs yet that the Navy is about to — or indeed should — abandon the P-75I.

https://www.thehindu.com/opinion/op-ed/torpedoing-a-submarine-rumour/article66433020.ece/

THE TIMES OF INDIA

Thu, 26 Jan 2023

Modi, El-Sisi Discuss Defence, Food Security; Egypt Backs India on Cross-border Terrorism

Counter-terrorism efforts, increasing radicalisation and cyber security were among the issues that dominated PM Narendra Modi's dialogue with Egyptian President Abdel Fattah El-Sisi, with Modi saying in a media statement later that both leaders agreed concerted action is necessary to end cross-border terrorism.

The summit also saw India and Egypt elevating their relationship to the level of strategic partnership in an effort to ramp up defence, political, energy and economic ties.

The two countries also signed five MoUs, including one for cooperation in cyber security, and discussed ways to strengthen food and healthcare security. The reference to cross-border terrorism is significant for India as it helps the government put the spotlight on Pakistan for its support to India-focused terror groups active on Pakistani soil. It also fits in neatly with the understanding in India that Egypt is one OIC country which has not fallen for Pakistan's propaganda campaign against India on the Kashmir issue.

Modi said India and Egypt, the most populous Arab country, were worried about the spread of terrorism happening around the world and that they're unanimous in the opinion that terrorism remained the most serious security threat to humanity. "Both countries also agree that concerted action is necessary to end cross-border terrorism. And for this, together we will continue to try to alert the international community," said Modi.

egypt Foreign secretary Vinay Kwatra later said both leaders strongly condemned the use of terrorism by countries as a foreign policy instrument and called for zero tolerance to terrorism and for "all those who encourage, support and finance terrorism, provide sanctuaries to terror groups, whatever their motivation may be."

Modi also said there's immense potential for enhancing security and defence cooperation between India and Egypt. "In the last few years, there has been a significant increase in joint exercise training and capacity building between our armies. We have also decided in today's meeting to further strengthen cooperation between our defence industries, and enhance the exchange of information and intelligence related to counter-terrorism," he said, adding misuse of cyber space to spread extremist ideologies and radicalization is a growing menace. El-Sisi acknowledged efforts to deepen defence ties and said the 2 countries had a common position on the need to counter terrorism and extremism.

The meeting saw discussions also on international issues like the Ukraine conflict and its effects on food and pharma supply chains. Egypt, which imports most of its wheat from Russia and Ukraine, has been particularly affected and has requested India for more wheat imports. India, which supplied 61,000 tonnes last year to Egypt overriding its own ban on wheat export, is considering Egypt's request to provide more of the grain.

Modi said he and El-Sisi agreed on the need for diplomacy and dialogue to resolve international disputes. India and Egypt, which is in the middle of a financial crisis with inflation at a record high and an external debt of $170 billion, also discussed efforts to improve bilateral trade and investment in food, pharmaceuticals and other areas. El-Sisi said in his media statement that Egypt was looking to welcome more Indian tourists. He also invited Modi to visit Egypt.

On defence cooperation, a major focus area, Kwatra said in a media briefing this was based on five sub-segments. "These are exercises, training, equipment, platforms, and more importantly, industry to industry cooperation," he said.

Kwatra said after the meeting that the strategic partnership will be based on four pillars. "The first will be the pillar of political and security cooperation. Economic engagement constitutes the second pillar. Three, scientific and academic collaboration and four, wider cultural and people to people contacts," he said.

https://timesofindia.indiatimes.com/india/modi-el-sisi-discuss-defence-food-security-egypt-backs-india-on-cross-border-terrorism/articleshow/97329552.cms

THE ECONOMIC TIMES

Fri, 27 Jan 2023

146 Containers from Pakistan Ordnance Factories Head to Ukraine via its Neighbours

Pakistan has stepped up military supplies to Ukraine from the Karachi Port, coinciding with fresh Western defence supplies to Kyiv to thwart advances by the Russian military in Ukraine in recent weeks, according to people familiar with the matter.

In recent weeks, Pakistan has increased ammunition and other defence supplies via third countries that border Ukraine, they said.Karachi-based shipping firm Project Shipping last week reportedly facilitated supplies of 146 containers from Pakistan Ordnance Factories, said people privy to the information. It came days after another shipment of 50,000 defence stores was sent by Pakistan Ordnance Factories via Karachi, they said, adding that the shipments from Pakistan are being transferred to Ukraine through Gdansk Port, Poland.

A vessel named BBC Vesuvius, carrying 155 mm projectiles, M4A2 Propelling bag charges, M-82 primers and PDM fuses, was reportedly sent from the Karachi Port via Ukraine earlier this month, ET had reported. Defence firms located in some eastern European states bordering Ukraine have emerged as a gateway for transferring Pakistan-manufactured military equipment, ET had reported. Islamabad-based arms supplier DMI Associates is said to be working in collaboration with defence firms in eastern Europe for transferring orders placed by the Ukrainian military. In return, Ukraine has promised Pakistan assistance in upgrading its Mi-17 helicopters. A Ukrainian firm involved with manufacturing of aircraft engines as well as industrial marine gas turbines is reportedly assisting in upgradation of Pakistan helicopters, according to people familiar with the matter, ET had earlier reported.

Last year, Pakistan played a critical role in transfer of arms on behalf of the UK to Ukraine. ET had then reported that the Nur Khan air base in Rawalpindi was part of the air bridge reportedly used by the UK for military aircraft flights to Avram Iancu Cluj International Airport in Romania via a British air base in the Mediterranean to transfer arms to Ukraine.

The air bridge had reportedly avoided Iran and Afghanistan airspace and used the West Asian air space to transfer arms between August 6 and 15. A Globemaster plane was used to transfer the arms. A British Air Force C-17A Globemaster III (call sign: ZZ173) is also said to have been used for daily sorties between the aforementioned period using the Pakistan air bridge, ET had reported in September. Artillery ammunition for the Ukrainian army may have been ferried via this air bridge. Ukraine and Pakistan share close military and industrial ties. Pakistan had purchased more than 320 Ukrainian T-80UD tanks in service with a fully formed ecosystem for their upkeep, use, ammunition and spare parts. Between 1991 and 2020, Ukraine concluded arms contracts worth nearly $1.6 billion with Pakistan. The Pakistan government has reportedly clinched a deal with Ukraine for the repair of its T-80UD fleet at a cost of $85.6 million.

In 2021, Pakistan and Ukraine agreed to optimise military ties, particularly in the defence production, training, counterterrorism activities and intelligence domains, ET had earlier reported.

https://economictimes.indiatimes.com/news/defence/146-containers-from-pakistan-ordnance-factories-head-to-ukraine-via-its-neighbours/articleshow/97359359.cms

THE ECONOMIC TIMES

Fri, 27 Jan 2023

US says 'Closely Monitoring' India-China Border Situation

The US has said it is closely monitoring the situation regarding the border clashes between India and China and it is glad that at least in December both India and China appeared to have

disengaged. "We are closely monitoring the situation broadly regarding border clashes but we are glad to hear that at least in December both sides (India and China) appeared to have disengaged," US State Department Principal Deputy spokesperson Vedant Patel said on Thursday. Patel, while responding to the media query in the regular briefing stated that Washington is relieved that the situation on both sides is calm.

Notably, the Ladakh border clash in 2020 has remained the dominant issue between the two sides. Since April 2020, India and China have also had several rounds of diplomatic and military level meetings on the situation along the Line of Actual Control (LAC) in the India-China border areas. Calling the China-India border situation "stable at the moment", Chinese Vice Foreign Minister Sun Weidong recently told Indian Ambassador to China Pradeep Kumar Rawat that the two sides should stand high and look far, and view bilateral relations from a comprehensive and long-term perspective.

Sun said that as the situation at the border is currently stable, both India and China should implement the important consensus between the leaders of the two nations, and also strengthen communication, the Ministry of Foreign Affairs of China said in an official statement.

India has repeatedly said that bilateral relations cannot be normal unless the border situation is and added that if China disturbs the peace and tranquillity in border areas, it will impact the relations further. Speaking further, the US Principal Deputy spokesperson also called India an important ally of the United States in a number of spaces. He said that India, in a number of domains including trade cooperation, security cooperation and technological cooperation has been a great partner to the US. The US State Department also condemned the Russian attack on Ukraine and extended sympathies to all those who were hurt.

https://economictimes.indiatimes.com/news/defence/us-closely-monitoring-india-china-border-situation-state-dept/articleshow/97362996.cms

THE ECONOMIC TIMES

Thu, 26 Jan 2023

China has Strong Economic, Strategic Need in Eastern Sector, hence Aggressively Building its Army to Dominate: Paper by IPS officers

China has a strong economic and strategic need in the Ladakh sector, which is why it is aggressively building its army to dominate the unfenced locations on the Indian side to lay claim on more areas, according to an official paper circulated at a high-level meeting. The paper, prepared by Indian Police Service officers and submitted at the DGPs/IGPs meet held last week,

said the country's border defense strategy should be given a new meaning and purpose with an economic incentive for the future, given India's limitation to be a part of the One Belt One Road (OBOR) or the China-Pakistan Economic Corridor (CPEC) project.

The paper suggests the strategy needs to be area-specific e.g. border tourism can be promoted aggressively in the Turtuk or Siachen sector, and Daulat Beg Oldi (DBO) or Depsang plains.On the the Karakoram pass in the DBO, the paper said it is an ancient connection to India's silk route history, and opening the area to domestic tourists shall counter the remoteness of the idea.

It suggested that expeditions on the pass which were famous since the 1930s can be restarted and trekking and hiking areas be opened in a limited manner. China has a strong economic and strategic need in the eastern border sector and they are aggressively building up their army to dominate the unfenced areas marked by the patrolling points (PPs) on the Indian side to lay their claim on the area for further domination, the paper noted.

Apart from Prime Minister Narendra Modi, the three-day annual conference was attended also by Union Home Minister Amit Shah, National Security Adviser Ajit Doval and about 350 top police officers of the country. An officer posted in Ladakh noted in the paper that during an interaction a senior security personnel, whose unit is based right on the forward area, told him it's worth it if India can buy peace with China's PLA for four years by retreating 400 metres.

This came amidst reports that out of 65 patrolling points (PPs), the presence of Indian Security Forces (ISFs) is lost in 26 PPs due to restrictive or no patrolling by the ISFs. The OBOR project of China has given a greater purpose to the PLA to build road and military infrastructure in the eastern sector that shall also aid the CPEC project connecting the Chinese producers to the Central Asian market and Gwadar port in Pakistan, the paper noted. Other than the reason that Ladakh is a strategic area for India with a historic connection, the monetisation potential of the region is missing in the country's purpose and so the constant loss of area since 1962 in the form of buffer zones being contested by the adversary keeps the security forces on the backfoot, it said. The paper noted that for inviting a large number of tourists, nomadic festivals at all India level should be celebrated at Ladakh's Demchok, Koyul, Dungti, Kakjung villages which are located on the banks of Indus river and very close to the Line of Actual Control (LAC).

According to the paper, the Chota Kailash at Demchok can be opened to tourists to pay obeisance and prayers for the mount Kailash and promote religious tourism for the devout Hindus who cannot go to Mansarovar yatras.

The Mount is under surveillance by PLA's cameras and the access to the top is highly restricted by the army. The documents said the civilian population near the border are the country's assets and their interests in terms of reclaiming lost pasture lands should be protected. Manual patrolling in the areas at regular periods needs to be replaced by more sophisticated technologies

like camera surveillance and comprehensive integrated border management system, the paper said. "The surveillance systems need to be tested for harsh weather conditions, strong power and storage backup at subzero temperatures. Premier research institutes like IISc, IITs, post graduate and Phd students can be funded with research by the government to find solutions on the suitable material for sub-zero climatic conditions that can be used in surveillance mechanisms," it suggested.

Patents can be an incentive to promote the research on finding suitable dwelling solutions for Jawans, winter uniform and surveillance, it said. "Needless to say, this shall cost a lot to the government exchequer and so a monetisation plan of border tourism is required to support the expense, even if it's a small start, it shall serve a purpose," the paper said.

https://economictimes.indiatimes.com/news/defence/china-has-strong-economic-strategic-need-in-eastern-sector-hence-aggressively-building-its-army-to-dominate-paper-by-ips-officers/articleshow/97351232.cms

नवभारत टाइम्स

Thu, 26 Jan 2023

यूक्रेन छोड़कर अटलांटिक में हाइपरसोनिक मिसाइल क्यों दाग रहा रूस? समझें चीन कनेक्शन

यूक्रेन युद्ध के बीच रूस का सबसे ताकतवर युद्धपोत अटलांटिक महासागर के तट पर युद्धाभ्यास कर रहा है। यह युद्धपोत दुनिया की सबसे ताकतवर हाइपरसोनिक मिसाइलों से लैस है। रूसी रक्षा मंत्रालय ने बताया है कि एडमिरल गोर्शकोव फ्रिगेट ने अटलांटिक महासागर में एक महत्वपूर्ण सैन्य अभ्यास को पूरा किया है। इस दौरान फ्रिगेट ने जिरकॉन मिसाइल का परीक्षण भी किया। यह अभ्यास अगले महीने चीनी और दक्षिण अफ्रीकी नौसेनाओं के साथ संयुक्त नौसैनिक अभ्यास के पहले किया गया है। मंत्रालय के जारी एक वीडियो में गोर्शकोव के कमांडर इगोर क्रोखमल ने कहा कि इस फ्रिगेट ने दुश्मन के युद्धपोतों के खिलाफ मिसाइल हमले का अभ्यास किया।

मिसाइल से 900 किमी की रेंज में लक्ष्य को किया बर्बाद

रूस की सरकारी समाचार एजेंसी तास ने बताया कि यह एक इलेक्ट्रॉनिक लॉन्च या वर्चुअल सिमुलेशन अभ्यास था। इस दौरान मिसाइल सिस्टम की डिजाइन की ई विशेषताओं की पुष्टि की गई। जहाज के कमांडर इगोर क्रोखमल ने कहा कि इस अभ्यास के दौरान मिसाइलों ने 900 किलोमीटर से अधिक दूरी तक पहुंचने की अपनी क्षमता का प्रदर्शन किया। जिरकॉन को दुनिया

की सबसे खतरनाक हाइपरसोनिक मिसाइल माना जाता है। ऐसे में जिरकॉन से लैस यह रूसी युद्धपोत किसी भी दुश्मन के खिलाफ निर्णायक कार्रवाई कर सकता है।

अगले महीने चीन और दक्षिण अफ्रीका के साथ होगा युद्धाभ्यास

बताया जा रहा है कि यह परीक्षण इस महीने की शुरुआत में लॉन्च किए गए एडमिरल गोर्शकोव फ्रिगेट की लंबी यात्रा का हिस्सा है। रूसी रक्षा मंत्रालय के अनुसार, यह युद्धपोत अफ्रीकी तट के किनारे चीन और दक्षिण अफ्रीकी नौसेना के साथ युद्धाभ्यास करेगा। इस दौरान तीनों देश संयुक्त प्रशिक्षण संबंधी जरूरतों को पूरा करेंगे। यह अभ्यास ऐसे समय में हो रहा है जब यूक्रेन पर रूस के आक्रमण को एक साल पूरे होने वाले हैं। रूस यह दिखाना चाहता है कि व्यापक अंतरराष्ट्रीय निंदा और प्रतिबंधों की बरसात के बावजूद वह विश्व मंच पर अलग-थलग नहीं है।

कितनी ताकतवर है जिरकॉन मिसाइल

जिरकॉन रूस की सबसे ताकतवर मिसाइल है। यह मिसाइल हाइपरसोनिक स्पीड से उड़ने में सक्षम है। इतनी ज्यादा स्पीड के कारण जिरकॉन मिसाइल किसी भी एयर डिफेंस को मात दे सकती है। जिरकॉन मिसाइल ध्वनि की रफ्तार से नौ गुना अधिक स्पीड से दौड़ सकती है। इस मिसाइल की रेंज 1000 किलोमीटर तक बताई जा रही है।

https://navbharattimes.indiatimes.com/world/rest-of-europe/russian-warship-admiral-gorshkov-armed-with-zircon-hypersonic-missiles-delivering-a-missile-strike-in-atlantic-ocean/amp_articleshow/97346826.cms

Science & Technology News

Press Information Bureau
Government of India

Ministry of Science & Technology

Wed, 25 Jan 2023

Artificial Synapse Developed for Brain-like Computing with Industry-Compatible Nitride Semiconductors

Scientists have used scandium nitride (ScN), a semiconducting material with supreme stability and Complementary Metal-Oxide-Semiconductor (CMOS) compatibility, to develop brain-like computing. This invention can provide a new material for stable, CMOS-compatible

optoelectronic synaptic functionalities at a relatively lower energy cost and hence has the potential to be translated into an industrial product.

The traditional computers have physically separated memory storage and processing units. As a result, it takes enormous energy and time to transfer data between these units during an operation. On the contrary, the human brain is a supreme biological computer that is smaller and more efficient due to the presence of a synapse (the connection between two neurons) that plays the role of both processor and memory storage unit. In the current era of artificial intelligence, the brain-like computing approach can help meet the escalating computational demands. The development of neuromorphic hardware aims at mimicking a biological synapse that monitors and remembers the signal generated by the stimuli. Scientists have been trying to create an artificial synaptic device that does not suffer from RC delays, exhibits large bandwidth, consumes low energy, and is stable, scalable, and CMOS-compatible.

JNCASR

A team of scientists at Bengaluru's Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute of the Department of Science and Technology, Government of India, who were working on nitride-based materials have used their background for developing hardware for neuromorphic computing. They used ScN to develop a device mimicking a synapse that controls the signal transmission as well as remembers the signal.

This work by Dheemahi Rao and team demonstrates an artificial optoelectronic synapse with ScN thin films that can mimic synaptic functionalities like short-term memory, long-term memory, the transition from short-term to long-term memory, learning–forgetting, frequency selective optical filtering, frequency-dependent potentiation and depression, Hebbian learning, and logic-gate operations.

Additionally, with varying magnesium (Mg) dopant concentrations, both excitatory (increase in current/synaptic strength) and inhibitory (decrease in current/synaptic strength) operations can be achieved in the same material that is not readily possible with other materials. The increase in resistivity (negative photoconductivity) in ScN and decrease in resistivity (positive photoconductivity) in Mg-doped ScN on shining light was used as the excitatory and inhibitory nature of the synapse, respectively. The persistence in the photoconductivity after turning off the light acts as a memory that lasts for several minutes to several days, depending on the nature of the stimuli. This work is the first demonstration of an optoelectronic synapse with a CMOS chip-compatible group-III nitride semiconductor.

JNCASR1

Compared to the existing materials used to demonstrate optoelectronic synapse, ScN is more stable, CMOS compatible, and can be seamlessly integrated with existing Si technology. It can act as a platform for both excitatory and inhibitory functions. The industrial processing techniques of ScN are similar to the existing semiconductor fabrication infrastructure. Response to the optical stimuli also has the advantage of possible integration with photonic circuits known for higher speed and broader bandwidth than electronic circuits.

"Our work enables neuromorphic computing research with a stable, scalable, and CMOS-compatible III-nitride semiconductor that exhibits both excitatory and inhibitory synaptic functionalities. Unlike the previous works on all-electronic synapse, our work shows an

optoelectronic synapse with a large bandwidth, reduced RC delays, and low power consumption."- said Dr.BivasSaha, Assistant Professor at the Jawaharlal Nehru Centre for Advanced Scientific Research. Apart from JNCASR, researchers from the University of Sydney (Dr. Magnus Garbrecht and Dr. Asha I. K. Pillai) also participated in this study published recently in the scientific journal Advanced Electronic Materials.

Publication: https://onlinelibrary.wiley.com/doi/full/10.1002/aelm.202200975

https://pib.gov.in/PressReleasePage.aspx?PRID=1893580

THE TIMES OF INDIA

Fri, 27 Jan 2023

IIA Hands Over Key Aditya-L1 Payload to Study Corona to ISRO

The Indian Institute of Astrophysics (IIA), which has built the Visible Line Emission Coronagraph (VELC) payload for Isro's Aditya-L1 mission at its CREST (Centre for Research and Education in Science and Technology) campus in Hoskote, on Thursday handover the same to the space agency.

Aditya-L1 is India's first dedicated scientific mission to study the Sun, and is expected to be launched by Isro in the second half of this year. It is an observatory-class space-based solar mission wherein the spacecraft will be placed in a halo orbit around the first Lagrange point (L1) of the Sun-Earth system.

According to Isro, a satellite around L1 point has the major advantage of continuously viewing the Sun without occultation/eclipses as the position provides a greater advantage of observing solar activities continuously.

Aditya-L1 will carry seven payloads to observe the photosphere, chromosphere, and the outermost layers of the Sun (the corona) using electromagnetic and particle detectors. While four payloads directly view the Sun from L1, the remaining three carry out in-situ studies of particles and fields at L1.

IIA said on Thursday: "VELC is the largest and one or the most technically challenging of the seven payloads that Aditya-L1 will carry. The payload is designed as an internally occulted reflective coronagraph and has been assembled, tested and calibrated at CREST campus."

To Study What

Pointing out that one of the main puzzles in solar astrophysics was that the atmosphere of the Sun (Corona) is at a temperature of about a million degrees whereas the surface of the Sun is only at about 6,000 Kelvin, IIA said, answering this needs continuous observations of the Corona.

"...Such observation needs to be done right from the surface of the Sun (its disk) and the lower Corona. VELC, which weighs 90kg, has an internal occulter which separates the light from the disk and discards it. The remaining light which is from the Corona, from 1.05Ro to 3Ro (Ro is the radius of the Sun) is sent for further processing," it said.

What's unique:

■ It can image solar corona down to as close as 1.05Ro (that is, starting from 1.05 times the solar radius). That would be the closest that any coronagraph on a space mission will be able to image the corona ever

■ It can take observations roughly 3 times every second and with a high pixel resolution of 2.5 arcseconds per pixel

■ Its instruments will have to be kept at a temperature of 22°C while also radiating away enormous amount of heat and light from the solar surface

■ VELC has 40 optical elements with an internally occulted coronagraph with a scatter of just 50 parts per million.

https://timesofindia.indiatimes.com/india/iia-hands-over-key-aditya-l1-payload-to-study-corona-to-isro/articleshow/97350144.cms

DECCAN HERALD

Thu, 26 Jan 2023

ISRO Eyes June-July Launch for Solar Mission, Receives Primary Payload

The Indian Space Research Organisation (Isro) is targeting a June-July time frame to launch Aditya L1, India's first dedicated scientific mission to study the Sun, Isro Chairman and Secretary, Department of Space, S Somanath said on Thursday. He was speaking at an event in Hosakote that marked the formal handing over of Visible Line Emission Coronagraph (VELC), the mission's primary payload developed by the Indian Institute of Astrophysics (IIA).

"Currently, we are getting the (Aditya L1) satellite ready. The payload will reach the U R Rao Satellite Centre and will be integrated with the satellite. It will go through extensive testing and evaluation and will be launched on the PSLV, by June-July," Somanath said.

The satellite with seven payloads will be launched to the L1 orbit – the first Lagrangian point of the Sun-Earth system, about 1.5 million km from the Earth – from where it can view the sun continuously, without blockage.

The primary payload

The 90-kg VELC was assembled, tested, and calibrated at the IIA's Centre for Research and Education in Science and Technology campus in Hosakote. The payload took about 15 years in the making, from concept to realisation.

VELC is designed to facilitate continuous observations of the Sun's atmosphere, the Corona. The extremely bright light from the Sun's surface, or disk, makes observation of the lower Corona very difficult. VELC comes with an 'internal occulter' that separates out this light, discards it, and sends the remaining light (from the Corona) for processing.

"It can image the solar Corona as close as 1.05 times the solar radius. It can also do imaging, spectroscopy, and polarimetry at the same time, and can take observations at a very high resolution and many times a second," Prof B Raghavendra Prasad, Principal Investigator of VELC, said.

Uninterrupted observations of the Corona are critical in studying the gap between temperatures in the Sun's atmosphere (about a million degrees) and its surface (only about 6,000 Kelvin), IIA said.

VELC is designed to study processes that lead up to the heating of the Corona and solar wind acceleration, aspects of space weather, and measurement of coronal magnetic fields.

There are six other payloads on Aditya L1, developed by Isro and other institutions-

1. Solar Ultraviolet Imaging Telescope (SUIT) – to provide full disk images of the solar atmosphere

2. Solar Low Energy X-Ray Spectrometer (SoLEXS) – to study the coronal heating mechanism

3. High Energy L1 Orbiting X-Ray Spectrometer (HEL1OS) – to observe dynamic/eruptive events in the Corona

4. Aditya Solar Wind Particle Experiment (ASPEX) – to study solar wind and its spectral characteristics

5. Plasma Analyser Package for Aditya (PAPA) – to understand the composition of solar wind plasma and its energy distribution

6. Magnetometer – to measure the magnitude and nature of the interplanetary magnetic field.

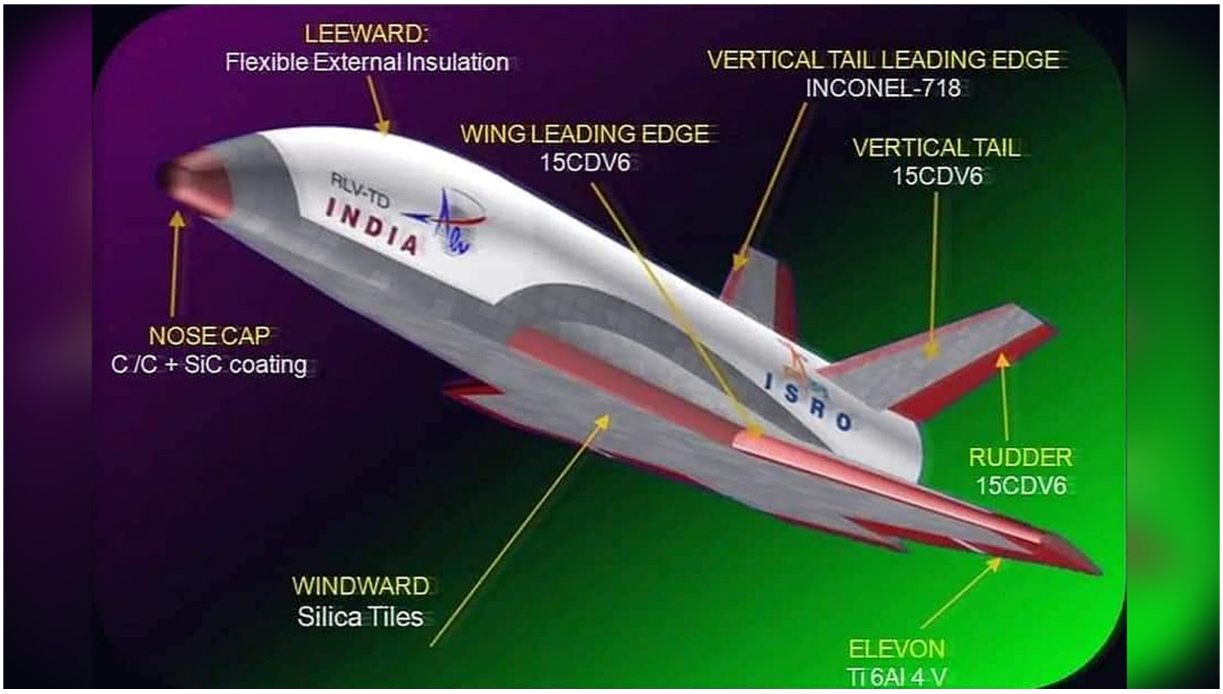
https://www.deccanherald.com/science-and-environment/isro-eyes-june-july-launch-for-solar-mission-receives-primary-payload-1184930.html

Thu, 26 Jan 2023

न्यू इंडिया का Transformer... यान भी हथियार भी, इसरो का ये नया एक्सपेरिमेंट बदल देगा युद्ध का पूरा तरीका

ISRO शनिवार यानी **28** जनवरी को रीयूजेबल लॉन्च व्हीकल (**RLV**) का लैंडिंग एक्सपेरिमेंट करने जा रहा है. यह जानकारी इसरो चीफ डॉ. एस सोमनाथ ने दी है. यह स्वदेशी स्पेस शटल है. जिसे ऑर्बिटल री-एंट्री व्हीकल (**ORV**) भी कहते हैं. लैंडिंग से पहले इसे एक छोटे रॉकेट या हेलिकॉप्टर से जमीन से करीब **3** किलोमीटर या उससे ऊपर ले जाया जाएगा.

उसके बाद वहां ये खुद नीचे आएगा और खुद ही ऑटोमैटिक लैंडिंग करेगा. अगर यह एक्सपेरिमेंट सफल होता है तो भारत अंतरिक्ष में न सिर्फ सैटेलाइट लॉन्च कर पाएगा. बल्कि भारत अपने आसमान की सुरक्षा में भी एक कदम आगे बढ़ जाएगा. क्योंकि ऐसी ही टेक्नोलॉजी का फायदा अमेरिका, रूस और चीन भी उठाना चाहते है. ऐसे यानों के जरिए किसी भी दुश्मन के सैटेलाइट्स को उड़ा सकते है.



ऐसे विमानों से डायरेक्टेड एनर्जी वेपन (**DEW**) चला सकते हैं. यानी ऊर्जा की किरण भेजकर दुश्मन के संचार तकनीक को खत्म कर देना. बिजली ग्रिड उड़ा देना या फिर किसी कंप्यूटर सिस्टम को नष्ट कर देना. भारत भी अपने दुश्मन के इलाके में यह काम इसी यान के जरिए कर सकता है. इसरो का मकसद है कि साल **2030** तक इस प्रोजेक्ट को सफल बनाने का मकसद है. ताकि बार-बार रॉकेट बनाने का खर्च बचे. ये सैटेलाइट को अंतरिक्ष में छोड़कर वापस लौट आएगा. थोड़ा मेंटेन करने के बाद उसे वापस सैटेलाइट लॉन्च करने के लिए भेज सकते हैं. इससे स्पेस मिशन की लागत कम से कम **10** गुना कम हो जाएगी.

रीयूजेबल लॉन्च व्हीकल के अत्याधुनिक और अगले वर्जन से भारतीय अंतरिक्षयात्रियों को स्पेस में भी भेजा जा सकता है. अभी ऐसे स्पेस शटल बनाने वालों में अमेरिका, रूस, फ्रांस, चीन और जापान ही हैं. रूस ने **1989** में ऐसा ही शटल बनाया था जिसने सिर्फ एक बार ही उड़ान भरी.

अभी जो स्पेस शटल बनाया जा रहा है वो अपने असली फॉर्मेट से करीब **6** गुना छोटा है. सारे टेस्ट सफल होने के बाद इसका असली आकार बनाया जाएगा.

छह साल पहले **2016** में रीयूजेबल लॉन्च व्हीकल की टेस्ट फ्लाइट हुई थी. तब यह एक रॉकेट के ऊपर लगाकर अंतरिक्ष में छोड़ा गया था. करीब **65** किलोमीटर तक गया था. यह एक हाइपरसोनिक उड़ान थी. इसकी स्पीड आवाज की गति से पांच गुना ज्यादा है. उसके बाद **180** डिग्री पर घूमकर वापस आ गया था. **6.5** मीटर लंबे इस स्पेसक्राफ्ट का वजन **1.75** टन है. बाद में इसे बंगाल की खाड़ी में उतार लिया गया.

रीयूजेबल लॉन्च व्हीकल की अभी जो लैंडिंग एक्सपेरिमेंट होना है, उसमें यह स्पेसक्राफ्ट खुद नेविगेट करेगा. खुद ग्लाइड करेगा. इसके बाद कर्नाटक के चल्लाकरे स्थित डिफेंस रनवे पर लैंड करेगा. यह परीक्षण इस स्पेसक्राफ्ट के एयर डायनेमिक्स को समझने के लिए जरूरी है. इसका एयरफ्रेम भी इसरो ने ही तैयार किया है. यह पूरी तरह से स्वदेशी है, इसलिए इसकी जांच हर तरह से किया जाना जरूरी है.

> ISRO Chairman Dr. S Somanath has said RLV-TD's Landing Experiment (LEX) is going to take place this Saturday/Jan 28!! #RLV #ISRO pic.twitter.com/9UWSAOchek
>
> — ISRO Spaceflight (@ISROSpaceflight) January 25, 2023

रीयूजेबल लॉन्च व्हीकल दो स्टेज का स्पेसक्राफ्ट है. पहला रीयूजेबल पंख वाला क्राफ्ट जो ऑर्बिट में जाएगा. जिसके नीचे एक रॉकेट होगा जो इसे ऑर्बिट तक पहुंचाएगा. एक बार ऑर्बिट में पहुंचने के बाद स्पेसक्राफ्ट अंतरिक्ष में सैटेलाइट छोड़कर वापस आ जाएगा. इसका उपयोग रक्षा संबंधी कार्यों में भी किया जा सकता है. अंतरिक्ष से ही दुश्मन पर हमला किया जा सकता है.

https://www.aajtak.in/science/story/isro-rlv-td-landing-experiment-on-28-january-indian-space-shuttle-weapon-tstr-1623876-2023-01-26