June
2021

समाचार पत्रों से चयित अंश
Newspapers Clippings

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खंड : 46 अंक : 106 01 जून 2021

Vol.: 46 Issue : 106 01 June 2021

रक्षा विज्ञान पुस्तकालय
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Press Information Bureau
Government of India

Ministry of Defence

Mon, 31 May 2021 5:15PM

MoD notifies 'Second Positive Indigenisation List' of 108 items to promote self-reliance & defence exports

In pursuance of Prime Minister Shri Narendra Modi's endeavor of '*Atmanirbhar Bharat'* and to boost indigenisation in the Defence sector, Raksha Mantri Shri Rajnath Singh has approved a proposal of the Department of Military Affairs, Ministry of Defence (MoD) to notify the 'Second Positive Indigenisation List' of 108 items. This will give further boost to indigenisation with active participation of public and private sector for fulfilling the twin objectives of achieving self-reliance and promoting defence exports. All the 108 items will now be procured from indigenous sources as per provisions given in Defence Acquisition Procedure (DAP) 2020.

The second list (enclosed) lays special focus on weapons/systems which are currently under development/trials and are likely to translate into firm orders in the future. Like the first list, import substitution of ammunition which is a recurring requirement has been given special focus. Not only does the list recognise the potential of local defence industry, it will also invigorate impetus to domestic Research &Development by attracting fresh investment into technology and manufacturing capabilities.

The 'Second Positive Indigenisation List' comprises complex systems, sensors, simulator, weapons and ammunitions like Helicopters, Next Generation Corvettes, Air Borne Early Warning and Control (AEW&C) systems, Tank Engines, Medium Power Radar for Mountains, MRSAM Weapon Systems and many more such items to fulfil the requirements of Indian Armed Forces.This second list is planned to be implemented progressively with effect from December 2021 to December 2025.

This second list has been prepared by MoD after several rounds of consultations with government and private manufacturing industry confederations to assess future capabilities of Indian Industry which will be able to meet requirements of the Armed Forces. This list provides continuous impetus towards self-reliance in Defence.

The Defence industry can gainfully utilise this golden opportunity to build robust Research and Development facilities, capacities and capabilities to meet the futuristic requirements of the Armed Forces. This list also provides an excellent opportunity for 'start-ups' as also MSMEs which will get tremendous boost from this initiative.

Towards this, Ministry of Defence, Defence Research and Development Organisation (DRDO) and Service Head Quarters (SHQs) will take all necessary steps, including hand holding of the Industry, to ensure that the timelines mentioned in the 'Second Positive Indigenisation List' are met, thereby facilitating an environment for Indian Defence Manufacturers to create world class infrastructure, assist in Government's 'Make in India' vision to make India self-reliant in defence and develop the capabilities for defence export in the near future.The Second Positive Indigenisation List will be hosted in the MoD website.

In August 2020, the 'First Positive Indigenisation' List comprising 101 items was notified, in pursuance of Government's endeavor of 'AtmaNirbhar Bharat Abhiyan' and to boost indigenisation in the defence sector. At that time, it was also highlighted that more such equipment would be identified progressively to facilitate and encourage defence manufacturing in the country.
https://pib.gov.in/PressReleasePage.aspx?PRID=1723148

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Mon, 31 May 2021 5:15PM

रक्षा मंत्रालय ने आत्मनिर्भरता और रक्षा निर्यात को प्रोत्साहित करने के लिए 108 सैन्य साज़ो सामानों की 'दूसरी सकारात्मक स्वदेशीकरण सूची' को अधिसूचित किया

प्रधानमंत्री श्री नरेन्द्र मोदी के 'आत्मनिर्भर भारत' दृष्टिकोण की दिशा में प्रयास तथा रक्षा क्षेत्र में स्वदेशीकरण को बढ़ावा देने के प्रयास का पालन करते हुए रक्षा मंत्री श्री राजनाथ सिंह ने रक्षा मंत्रालय के सैन्य मामलों के विभाग की 108 सैन्य साजोसामानों की 'दूसरी सकारात्मक स्वदेशीकरण सूची' को अधिसूचित करने वाले प्रस्ताव को मंजूरी दे दी है। इससे आत्मनिर्भरता हासिल करने और रक्षा निर्यात को बढ़ावा देने के दोहरे उद्देश्य को पूरा करने के लिए सार्वजनिक और निजी क्षेत्र की सक्रिय भागीदारी के साथ स्वदेशीकरण को और अधिक बढ़ावा मिलेगा। रक्षा अधिग्रहण प्रक्रिया (डीएपी) 2020 में दिए गए प्रावधानों के अनुसार अब सभी 108 वस्तुओं की खरीद स्वदेशी स्रोतों से की जाएगी।

दूसरी सूची (साथ में संलग्न) उन हथियारों/प्रणालियों पर विशेष ध्यान देती है जो वर्तमान में विकास/ परीक्षणों के अधीन हैं और जिनके भविष्य में पक्के आदेशों में परिणत होने की संभावना है। पहली सूची की तरह गोला-बारूद के आयात प्रतिस्थापन पर विशेष ध्यान दिया गया है। न केवल सूची में स्थानीय रक्षा उद्योग की क्षमता को मान्यता दी गई है, बल्कि यह प्रौद्योगिकी व विनिर्माण क्षमताओं में नए निवेश को आकर्षित करके घरेलू अनुसंधान और विकास को भी बढ़ावा देगा।

'दूसरी सकारात्मक स्वदेशीकरण सूची' में जटिल प्रणालियां, सेंसर, सिम्युलेटर, हथियार और गोला-बारूद जैसे हेलीकॉप्टर, नेक्स्ट जेनरेशन कॉर्वेट, एयर बोर्न अर्ली वार्निंग एंड कंट्रोल (एईडब्ल्यूएंडसी) सिस्टम, टैंक इंजन, पहाड़ों के लिए मीडियम पावर रडार, एमआरएसएएम हथियार प्रणालियां और भारतीय सशस्त्र बलों की आवश्यकताओं को पूरा करने के लिए ऐसी अनेक और चीजें शामिल हैं। इस दूसरी सूची को दिसंबर 2021 से दिसंबर 2025 तक उत्तरोत्तर लागू किए जाने की योजना है ।

भारतीय उद्योग की भावी क्षमताओं का आकलन करने के लिए सरकारी और निजी विनिर्माण उद्योग परिसंघों के साथ अनेक दौर के विचार-विमर्श के बाद रक्षा मंत्रालय द्वारा यह दूसरी सूची तैयार की गई है जो सशस्त्र बलों की आवश्यकताओं को पूरा करने में सक्षम होगी। यह सूची रक्षा के क्षेत्र में आत्मनिर्भरता की दिशा में निरंतर प्रोत्साहन प्रदान करती है।

रक्षा उद्योग सशस्त्र बलों की भावी आवश्यकताओं को पूरा करने के लिए मजबूत अनुसंधान तथा विकास सुविधाएं और क्षमताओं के निर्माण के लिए इस सुनहरे अवसर का लाभ उठा सकता है। यह सूची 'स्टार्ट-

अप' के साथ-साथ एमएसएमई के लिए भी एक उत्कृष्ट अवसर प्रदान करती है जिसे इस पहल से जबरदस्त बढ़ावा मिलेगा।

इस दिशा में रक्षा मंत्रालय, रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) और सर्विस हेड क्वार्टर (एसएचक्यू) उद्योग का हाथ थामने समेत सभी आवश्यक कदम उठाएंगे ताकि यह सुनिश्चित किया जा सके कि 'दूसरी सकारात्मक स्वदेशीकरण सूची ' में उल्लिखित समय सीमा को पूरा किया जाए, ताकि भारतीय रक्षा निर्माताओं को विश्व स्तरीय बुनियादी ढांचा तैयार करने, भारत को रक्षा के क्षेत्र में आत्मनिर्भर बनाने और निकट भविष्य में रक्षा निर्यात की क्षमताओं को विकसित करने के लिए सरकार के मेक इन इंडिया नज़रिए में मदद हेतु एक वातावरण निर्मित हो पाए। दूसरी सकारात्मक स्वदेशीकरण सूची रक्षा मंत्रालय की वेबसाइट में उल्लिखित की जाएगी।

अगस्त 2020 में 'आत्मनिर्भर भारत अभियान' के सरकार के प्रयास एवं रक्षा क्षेत्र में स्वदेशीकरण को बढ़ावा देने की सरकारी कोशिश के अनुपालन में 101 चीजों की 'पहली सकारात्मक स्वदेशीकरण' सूची अधिसूचित की गई थी। उस समय यह भी रेखांकित किया गया था कि देश में रक्षा विनिर्माण को सुगम और प्रोत्साहित करने के लिए ऐसे और अधिक उपकरणों की आगे और पहचान की जाएगी।

https://pib.gov.in/PressReleasePage.aspx?PRID=1723271

THE NEW INDIAN EXPRESS

Tue, 01 June 2021

India expands negative list for defence imports with 108 new items

The first negative list for defence imports include towed artillery guns, short-range surface-to-air missiles, cruise missiles and offshore patrol vessels was issued last August

New Delhi: In a big push towards defence indigenisation, India on Monday approved restrictions on the import of an additional 108 military weapons and systems such as next-generation corvettes, airborne early warning systems, tank engines and radars under a staggered timeline of four-and-half years.

The first negative list for defence imports comprising 101 items that included towed artillery guns, short-range surface-to-air missiles, cruise missiles and offshore patrol vessels was issued last August.

Defence Minister Rajnath Singh (Photo| Twitter)

The restrictions on import of the 108 items that figured in the second list will progressively come into effect in the period from December 2021 to December 2025, officials said.

Describing it as the 'second positive indigenisation list', the defence ministry said it was notified after receiving approval from Defence Minister Rajnath Singh.

"The second positive indigenisation list comprises complex systems, sensors, simulator, weapons and ammunitions like Helicopters, next-generation corvettes, airborne early warning and control systems, tank engines, medium power radar for mountains, MRSAM weapon systems and many more such items to fulfil the requirements of Indian armed forces," it said.

According to a government document, the import restrictions on 49 items including next-generation corvette, some variants of single-engine helicopters, wheeled armoured platform, border

surveillance system and armoured engineer recce vehicle will come into force from December 2021.

The embargo on another 21 items will be applicable from December 2022.

The items mentioned in the list included 80 MM Tandem Warhead Rocket, software-defined radio, mechanical minefield marking equipment (land-based) and pontoon mid-stream bridging system.

A separate list of 17 items such as mountain weapon locating radar, smart anti airfield weapon (SAAW) Mk-I and loitering munitions have been identified for import restrictions from December 2023 while the ban on 13 items will be applicable from December 2024.

The import ban on eight other systems and weapons including anti-material rifle (AMR) 14.5 MM 1000HP engine for T-72 tanks will come into force from December 2025, according to the document.

Officials said the second list has been prepared by the defence ministry after several rounds of consultations with state-owned and private defence manufacturing firms as well as leading industry bodies such as the Society of Indian Defence Manufacturers (SIDM).

"The second positive indigenisation list is another testament of the confidence placed by the government and the armed forces on the industry to deliver cutting-edge defence technology for India's security requirements," SIDM President Jayant D Patil said.

He said the list is comprehensive with "truly big-ticket items" to be built in India and will be a great boost to making India self-reliant.

The first negative list of items for defence imports included towed artillery guns, short-range surface-to-air missiles, cruise missiles, offshore patrol vessels, electronic warfare systems, next-generation missile vessels, floating dock and anti-submarine rocket launchers.

"In pursuance of Prime Minister Narendra Modi's endeavour of 'Atmanirbhar Bharat' and to boost indigenisation in the defence sector, Defence Minister Rajnath Singh has approved a proposal of the Department of Military Affairs to notify the 'second positive indigenisation list' of 108 items," the defence ministry said.

"This will give a further boost to indigenisation with the active participation of public and private sector for fulfilling the twin objectives of achieving self-reliance and promoting defence exports," it said.

The ministry said all the 108 items will be procured from indigenous sources as per provisions of the Defence Acquisition Procedure (DAP) 2020.

"The second list lays special focus on weapons/systems which are currently under development/trials and are likely to translate into firm orders in the future.

Like the first list, import substitution of ammunition which is a recurring requirement has been given special focus," the defence ministry said in a statement.

"Not only does the list recognise the potential of the local defence industry, it will also invigorate impetus to domestic research and development by attracting fresh investment into technology and manufacturing capabilities," it said.

In the last couple of years, the government has taken a series of measures to boost the domestic defence industry.

On August 9 last year, Singh announced that India will stop the import of 101 weapons and military platforms like transport aircraft, light combat helicopters, conventional submarines, cruise missiles and sonar systems by 2024.

Subsequently, the defence ministry released the first list of items, with a detailed timeline, which will not be allowed to import.

The new defence procurement policy of the defence ministry projected a turnover of Rs 1.75 lakh crore (USD 25 billion) in defence manufacturing by 2025.

India is one of the most lucrative markets for global defence giants.

The country figured among the few top importers of military hardware in the world for the last eight to ten years.

According to estimates, the Indian armed forces are projected to spend around USD 130 billion in capital procurement in the next five years.

"The defence industry can gainfully utilise this golden opportunity to build robust research and development facilities, capacities and capabilities to meet the futuristic requirements of the armed forces," the ministry said.

"This list also provides an excellent opportunity for 'start-ups' as also MSMEs which will get a tremendous boost from this initiative," it said.

It said the ministry, the Defence Research and Development Organisation (DRDO) and service headquarters will take all necessary steps, including hand-holding of the industry, to ensure that the timelines mentioned in the new list are met.

https://www.newindianexpress.com/nation/2021/may/31/india-expands-negative-list-for-defence-imports-with-108-new-items-2310016.html

Business Standard

Tue, 01 June 2021

Towards indigenisation: MoD puts 108 defence items on import ban list

This list supplements an earlier import embargo on 101 defence items announced last August

By Ajai Shukla

New Delhi: The Ministry of Defence (MoD) announced on Monday a “Positive Indigenisation List” of 108 items of defence equipment that must be compulsorily procured from indigenous sources according to provisions in the Defence Acquisition Procedure 2020. The list includes 49 items that will be banned for import after December this year; 21 that cannot be imported after end-2022; 17 that will be banned for import after December 2023; 13 after December 2024; and eight that will have to be procured indigenously after December 2025.

This list supplements an earlier import embargo on 101 defence items announced last August.

“The list lays special focus on weapons/systems which are currently under development /trials (in India) and are likely to translate into firm orders in the future. Like the first list, import substitution of ammunition, which is a recurring requirement, has been given special focus,” stated an MoD release on Monday.

The list “provides an excellent opportunity for ‘start-ups’, as also MSMEs, which will get tremendous boost from this initiative,” the MoD said, adding, “Towards this, the MoD, the Defence Research and Development Organisation and service headquarters will take all necessary steps, including hand holding of the industry, to ensure that the timelines mentioned in the ‘second positive indigenisation list’ are met.”

Starting this December, the military will rely exclusively on indigenous vendors for defence equipment, including land-based, single-engine, light helicopters, next-generation corvettes, mission systems for airborne early warning and control system, helicopter launched anti-tank guided missile, warship-grade steel and armoured or mine-protected infantry vehicles.

December 2022, indigenous defence industry will be required to supply equipment, including thermal imaging sights for rifles and machine guns, an armoured bulldozer for mechanised and engineer units, a data network for the operations rooms of ships and, crucially, a manpack version of a software defined radio (SDR).

From December 2023, the military must rely on indigenous supply for mountain-based weapon locating radar that operate with automatic electronically scanned arrays, an upgraded version of the

76 mm naval super-rapid gun mount, video processing cards for the Sukhoi-30MKI fighter and a hand-held version of SDR.

Similarly, a raft of new equipment can be obtained only within the country after December 2024, including: Onboard oxygen generation system for fighter aircraft, starting with the Tejas, a medium power radar for mountains; fuel drop tanks for Jaguar and Mirage fighter aircraft and long range glide bombs (250 kg and 450 kg).

Finally, after the end of 2025, there will be no import of anti-material rifles and their 14.5 mm armour piercing Incendiary ammunition.

The Society of Indian Defence Manufacturers (SIDM) welcomed the announcement: "The list creates long-term business opportunities that will enable the industry to invest and build capacity and capability. The [defence] industry is motivated and stands highly encouraged with the Second Positive List."

TOWARDS INDIGENISATION

Year of import embargo and name of weapon platform/ equipment

DECEMBER 2021

- Single-engine light helicopter (land variant)
- Next-generation corvette
- Mission system for airborne early warning and control system
- Armoured or mine-protected infantry vehicles
- Helicopter launched anti-tank guided missile (ATGM)
- Multi-functional displays for indigenously produced aircraft
- Warship-grade steel DMR 249A
- Armoured Engineer Recce Vehicle (AERV)
- Armoured Repair and Recovery Vehicle (ARRV)
- Land Based MRSAM Weapon System

DECEMBER 2022

- Thermal Imaging (TI) sight for small arms
- Armoured bulldozer
- Data network for ships
- Trawl assembly for tanks
- Software Defined Radio (manpack version)

DECEMBER 2023

- Software Defined Radio (hand held)
- Mountain Weapon Locating Radar (AESA based)

- Smart Anti Airfield Weapon (SAAW)
- Upgraded 76 mm naval super-rapid gun mount (SRGM)
- Video processing card for Sukhoi-30 fighter

DECEMBER 2024

- Long range glide bomb (250 kg and 450 kg)
- Onboard Oxygen Generation System (OBOGS) for fighters
- Medium Power Radar (MPR) for mountains
- Fuel drop tanks for Jaguar and Mirage fighter aircraft
- General purpose bomb (125 kg and 500 kg) for fighters

DECEMBER 2025

- Anti-material rifle (AMR) 14.5 millimetre
- 14.5 mm Armour Piercing Incendiary (API) ammo for (AMR)
- 1000 Horse Power engine for Tank (T-72)
- Auxiliary Power Unit (APU) for T-72 and T-90 tanks
- Air data computer for trainer aircraft

https://www.business-standard.com/article/current-affairs/towards-indigenisation-mod-puts-108-defence-items-on-import-ban-list-121053101569_1.html

ThePrint

Tue, 01 June 2021

DRDO will begin trials of Made-in-India towed artillery in June but Army still has 'concerns'

While the DRDO insists ATAGS are better than the Israeli ATHOS, the army has voiced concern over its weight and inability to meet critical performance parameters

By Snehesh Alex Philip, Edited by Poulomi Banerjee

New Delhi: Confirmatory desert trials of the indigenous Advanced Towed Artillery Gun System (ATAGS), being developed by the Defence Research and Development Organisation (DRDO) along with private firms Bharat Forge and TATA Power SED, will begin in June.

Sources in the ATAGS development programme told ThePrint that after the summer trials this year, orders can be placed in the industry, following which the system will become operational in the armed forces.

They added that the validation trials at high altitude areas, including mobility trials in hilly and mountainous terrain have been completed.

The ATAGS is part of the Army's Field Artillery Rationalisation Plan, which had been drawn up in 1999. According to this plan, the Army is supposed to have a different kinds of artillery, including the towed system, which is meant to be a 155mm x 52 caliber.

The DRDO Bhavan in Delhi | Commons

With the global procurement plans for a towed gun faltering despite multiple attempts, the project for ATAGS was rolled out by the DRDO around 2010.

The ATAGS, which is being developed by the DRDO with the two private firms, fired for the first time in a fully integrated model in 2016.

This development came even as the Army has been pursuing a separate process for procurement of towed guns from abroad under the 'Make In India' initiative.

The gun that has finally emerged as the lowest bidder for this process was the ATHOS of the Israeli firm Elbit, in 2019.

The deal was for the supply of 400 guns and indigenous production of another 1,180 guns by the Ordnance Factory Board (OFB), under a full Transfer of Technology (TOT) process.

However, the Army has changed its plans and is now eyeing to only procure 400 of the ATHOS, but the DRDO is objecting even to this and says the ATAGS is better and is the weapon of the future.

A final decision on ATHOS is still pending as reported on 28 May.

Army's concern and comparison

Defence sources said that the development of ATAGS has been completed and is presently under PSQR (Weapons procurement and qualitative requirements) trials to finalise the final configuration of the gun system.

However, the Army has a "few issues of concern".

Sources said that the first among these is the aspect of extra weight, which may impact on the operational performance of the gun system in mountainous and high altitude terrain. The ATAGS is said to weigh around 18 tonnes. In comparison, the ATHOS weigh less than 15 tonnes.

Those advocating for the ATAGS say that if the weight is indeed an issue, other systems like the Dhanush gun can be used for the mountains besides the lightweight howitzers along with the indigenous towed system.

"Not all guns have to operate in the same way across all terrains. In tanks, we have the T-90 and T-72 which can operate easily in the mountains and can also be airlifted there. But we also have the Arjun, which cannot operate in the same way it would in desert areas," a defence expert, who did not wish to be identified, said.

ATAGS programme sources said the self-propelled mobility of this system is high and it is capable of crossing all Indian bridges and terrain.

They also said that the in weight category it is comparable with other comparable gun systems in the world.

Industry sources said that the most significant achievement during the second phase of PSQR Winter Trials was moving the guns to the Northern-most point of operational area (Lukrep) in the Plateau areas of North Sikkim.

The movement was undertaken mostly during the hours of darkness to facilitate undisturbed movement of tourists and civilian vehicles and at the same time maintain confidentiality of the gun system with our adversaries.

They said that ATAGS (Bharat Forge) has demonstrated efficient towed movement in the treacherous terrain climbing altitudes up to 15,500 ft.

"Movement to Lukrep meant covering 341 kilometres and was tested over 10 days. ATAGS could negotiate the otherwise un-accessible mountainous terrain with steep gradient and narrow Hair-Pin Bends with ease, without needing to unhook the Gun from the Tower. In similar terrain, other systems need to be unhooked and moved in self-propelled mode, thereby increasing the overall travel time," a source said.

He added that the total distance traveled by the ATAGS in mountains and high altitude was 526 kms as against 23 Kms mobility test done for foreign guns.

"So there cannot be any doubt on the mobility component of the ATAGS. The foreign gun should also be tested at the same location if someone believes that it is better," the source added.

He added that the the ease with which the Bharat Forge Gun could traverse the complete stretch, stands testimony to the ability of the Guns to move into the remotest of places, in any type of terrain.

Defence sources have also voiced other concerns about the ATAGS, however. A second concern they said is the "inability of the gun" system to meet the critical performance parameters, especially with regard to rates of fire.

ATAGS programme sources said that the rate of fire includes the burst firing of five rounds in one minute, intense firing of 10 rounds in two-and-a-half minutes and a sustained rate of 60 rounds in sixty minutes.

In comparison, the Elbit Systems claims ATHOS can fire three rounds in 30 seconds, 12 rounds in three minutes, and 42 rounds in sixty minutes.

The third concern expressed is the September 2020 accident during the internal validation trials of the ATAGS in a firing range. The barrel of the gun burst while firing a round.

Incidentally the cost is also a factor. While the ATHOS will cost less than Rs 11 crore per piece, the ATAGS is said to be costing anywhere between Rs 16-18 crore.

One area where the ATAGS outguns other systems is the range. The ATAGS's range with Extended Range Sub-Bore Boat Tail (ERFB BT) ammunition is 35 km and with ERFB BB (Base Bleed) ammunition is 45 km. The ATAGS has actually fired at a range of 47 KMS in 2017.

It is said that when the ATAGS will finally be ordered, both private firms will get orders, but the lowest bidder would get the largest share – 60 per cent or more.

Both guns – Bharat Forge and TATA – have the same performance parameters and the final contract will be awarded based on the cost cited.

https://theprint.in/defence/drdo-will-begin-trials-of-made-in-india-towed-artillery-in-june-but-army-still-has-concerns/668417/

दिप्रिंट

Tue, 01 June 2021

भारत में बने टोड आर्टिलरी का जून में ट्रायल शुरू करेगा DRDO लेकिन सेना की अभी भी हैं कुछ 'चिंताएं'

डीआरडीओ इस बात पर लगातार जोर दे रहा है कि एडवांस टोड ऑर्टिलरी गन सिस्टम इजरायली गन एथोस से कहीं बेहतर है फिर भी सेना ने इसके वजन और महत्वपूर्ण प्रदर्शन मानकों को पूरा करने के प्रति इसकी अक्षमता पर अपनी चिंता व्यक्त की है।

By स्नेहेश एलेक्स फिलिप

नई दिल्ली: निजी व्यावसायिक कंपनियां भारत फोर्ज और टाटा पावर-एसईडी के साथ मिलकर रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) द्वारा विकसित स्वदेशी एडवांस्ड टोड आर्टिलरी गन सिस्टम (एटीएजीएस) की अंतिम पुष्टि के लिए परीक्षण जून महीने में शुरू करेगी।

एटीएजीएस विकास कार्यक्रम से जुड़े सूत्रों ने दिप्रिंट को बताया कि इस साल के ग्रीष्मकालीन परीक्षणों के बाद इसके उत्पादन हेतु उद्योगों को आदेश दिए जा सकते हैं, जिसके बाद यह रक्षा प्रणाली सशस्त्र बलों में संचालन के लिए शामिल हो जाएगी। उन्होंने बताया कि पथरीले और पहाड़ी इलाकों में इस गन सिस्टम के मोबिलिटी ट्रायल सहित ऊंची पहाड़ी वाले क्षेत्रों में इसके वैलिडेशन ट्रायल (सत्यापन हेतु परीक्षण) को भी पूरा कर लिया गया है।

एटीएजीएस सेना की फील्ड आर्टिलरी रैसनाइलाइजेसन प्लान- जिसे 1999 में तैयार किया गया था- का एक महत्वपूर्ण हिस्सा है। इस योजना के अनुसार, सेना के पास टोड सिस्टम सहित एक अलग प्रकार की तोपें- यानि कि 155 मिमी x 52 कैलिबर की गन वाली तोपें होनी चाहिए।

कई बार के प्रयासों के बावजूद टोड गन के लिए वैश्विक स्तर पर खरीद के लिए जारी किये गए प्रस्तावों की विफलता के मध्य डीआरडीओ द्वारा एटीएजीएस के निर्माण के लिए एक परियोजना को 2010 के आसपास शुरू किया गया था। एटीएजीएस, जिसे डीआरडीओ द्वारा दो निजी फर्मों के सहयोग से विकसित किया जा रहा है, को 2016 में पहली बार पूरी तरह से एकीकृत मॉडल में पेश किया गया था।

यह सब कुछ उस समय हुआ जब सेना 'मेक इन इंडिया' वाली पहल के तहत विदेशों से टोड आर्टिलरी की खरीद के लिए एक अलग प्रक्रिया अपना रही है।

इस प्रक्रिया के लिए आखिरकार जो आर्टलरी सिस्टम सबसे कम बोली लगाने वाले प्रस्ताव के रूप में सामने आया है उसे 2019 में इजरायली फर्म एल्बिट द्वारा ऐथोस गन के लिए पेश किया था।

यह सौदा पूरी तरह से प्रौद्योगिकी हस्तांतरण (ट्रांसफर ऑफ टेक्नोलॉजी) प्रक्रिया के तहत ऑर्डिनेंस फैक्टरी बोर्ड द्वारा 400 तोपों की आपूर्ति और अन्य 1,180 तोपों के स्वदेशी उत्पादन के लिए था।

हालांकि, बाद में सेना ने अपनी योजनाओं में बदलाव किया है और अब वह केवल 400 एथोस गन की खरीद का इरादा रखता है, लेकिन डीआरडीओ इस पर भी आपत्ति जता रहा है और कह रहा है कि एटीएजीएस ऐथोस से कहीं बेहतर है और यह भविष्य का हथियार है।

28 मई तक की जानकारी के अनुसार एथोस के बारे में कोई अंतिम निर्णय अभी भी लंबित है।

सेना की चिंताएं और तुलनात्मक अध्ययन

रक्षा सूत्रों का कहना है कि एटीएजीएस का विकास कार्य अब पूरा हो चुका है और वर्तमान में इस गन सिस्टम के अंतिम प्रारूप को तय करने के लिए प्रिलिमिनरी सर्विसेज क्वालिटेटिव रिक्वायरमेंट्स-

पीएसक्यूआर (हथियार की खरीद और गुणवत्ता संबंधी आवश्यकताओं की रिपोर्ट) के लिए हो रहे परीक्षणों के तहत है। हालांकि, सेना के पास इस बारे में 'चिंता के लिए कुछ मुद्दे' अभी भी हैं।

सूत्रों ने बताया कि इनमें से पहली चिंता इसके अतिरिक्त वजन वाले पहलू को लेकर है, जो पहाड़ी और ऊंचाई वाले इलाकों में इस गन सिस्टम के परिचालन प्रदर्शन को प्रभावित कर सकता है। एटीएजीएस का वजन लगभग 18 टन बताया जाता है। इसकी तुलना में एथोस का वजन 15 टन से भी कम है।

एटीएजीएस की वकालत करने वाले सूत्र भी यह मानते हैं कि इसका अतिरिक्त वजन एक मुद्दा है लेकिन उनका कहना है कि धनुष तोप जैसी अन्य प्रणालियों का इस्तेमाल पहाड़ों में भी किया जा सकता है। इसके अलावा हल्के हॉवित्जर तोप भी हैं, जो अमेरिका से विशेष रूप से पहाड़ी क्षेत्रों के लिए ही खरीदे गए थे।

एक रक्षा विशेषज्ञ ने नाम न बताने की शर्त पर कहा, 'सभी तोपों को सभी इलाकों में एक ही तरह से संचालित नहीं किया जाता। टैंकों के मामले में हमारे पास T-90 और T-72 जैसे टैंक होते हैं जो पहाड़ों में आसानी से चल सकते हैं और वहां एयरलिफ्ट भी किए जा सकते हैं। लेकिन हमारे पास स्वदेश निर्मित अर्जुन भी है, जो वहां उस तरह से काम नहीं कर सकता जैसे कि रेगिस्तानी इलाकों में होता है।'

एटीएजीएस कार्यक्रम से जुड़े सूत्रों ने बताया कि इस प्रणाली की स्व-चालित गतिशीलता (सेल्फ प्रोपेल्ड मोबिलिटी) काफी अधिक है और यह सभी तरह के भारतीय पुलों और इलाकों को पार करने में सक्षम है।

उन्होंने यह भी कहा कि अपने भार वर्ग में यह दुनिया में मौजूद किसी भी अन्य गन सिस्टम के साथ पूरी तरह से तुलनीय है। रक्षा सूत्रों ने कहा कि सेना की दूसरी चिंता महत्वपूर्ण प्रदर्शन मानकों- खासकर इसके गोले दागने की दरों के संबंध में- को पूरा करने के लिए इस गन सिस्टम की 'अक्षमता' को लेकर है।

एटीएजीएस कार्यक्रम से जुड़े सूत्रों का कहना है कि इसकी गोले दागने की दर में एक मिनट में पांच राउंड फायरिंग, ढाई मिनट में 10 राउंड की तीव्र फायरिंग और साठ मिनट में 60 राउंड की निरंतर गोले दागने की दर भी शामिल है।

इसकी तुलना में, एल्बिट सिस्टम्स का दावा है कि ऐथोस गन 30 सेकंड में तीन राउंड, तीन मिनट में 12 राउंड और साठ मिनट में 42 राउंड फायर कर सकता है। तीसरी चिंता की वजह फायरिंग रेंज में एटीएजीएस के आंतरिक सत्यापन परीक्षणों के दौरान सितंबर 2020 में हुई दुर्घटना है। उस समय गोले दागते समय इस गन की नली (बैरल) फट गई थी। संयोगवश, इसकी लागत भी एक अतिरिक्त कारक है। एथोस गन की कीमत जहां 11 करोड़ रुपये प्रति गन से कम होगी, वहीं एटीएजीएस की कीमत 16-18 करोड़ रुपये के बीच बताई जा रही है।

एक क्षेत्र जहां एटीएजीएस अपने सभी प्रतिद्वंदियों को पछाड़ देता है वह है इसकी गोले दागने की अधिकतम सीमा (फायरिंग रेंज)। सब-बोर बोट टेल (ई आर एफ बी- टी) वाले गोला-बारूद (ऐम्यनिशन) के साथ एटीएजीएस के विस्तारित फायरिंग रेंज की सीमा 35 किमी है और वहीं ई आर एफ बी- बीबी (बेस ब्लीड) गोला-बारूद के साथ यह रेंज 45 किमी है। 2017 में एटीएजीएस ने वास्तव में 47 किमी की दूरी तक भी फायरिंग की है।

ऐसा कहा जा रहा है कि जब एटीएजीएस को खरीद का आदेश दिया जाएगा, तो वैसे तो दोनों निजी फर्मों को भी आपूर्ति आदेश (सप्लाई आर्डर) मिल जाएगा, लेकिन सबसे कम बोली लगाने वाले फर्म को इसके बड़े हिस्से- 60 प्रतिशत या उससे अधिक का आर्डर मिलेगा। दोनों फर्मों- भारत फोर्ज और टाटा के द्वारा बनाई गई गन में समान प्रदर्शन पैरामीटर हैं और अंतिम अनुबंध लागत के आधार पर तय की जाएगी।

https://hindi.theprint.in/defence/drdo-to-start-testing-of-made-in-india-towed-artillery-gun-in-june-amid-army-concerns/219309/

SHEPHARD NEWS

Tue, 01 June 2021

India ramps up military satellite plans

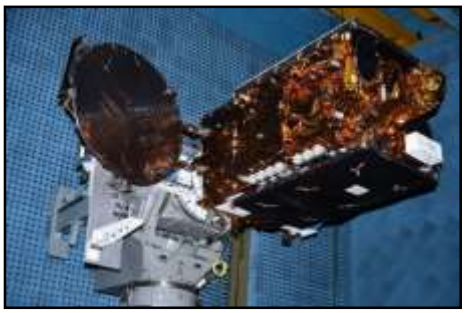
Satellites offer numerous ISR advantages, ones that the Indian military needs more than ever

By Neelam Mathews

Delhi: As the need for maritime domain awareness grows, and as border tensions with China and Pakistan increase, vulnerabilities in Indian space security have caused Delhi to look to build up its minuscule number of military satellites.

Presently, India has around 15 military-application satellites, with the latest GSAT-7A dedicated to the air force but shared by the army.

In 2022, the $225 million GSAT-7R — an Indian Navy (IN) communications satellite — will replace GSAT-7 Rukmini launched eight years ago. It is the last of the Indian Space Research Organisation's seven fourth-generation satellites with a 2,000nmi coverage range over the Indian Ocean.



The latest GSAT-7A satellite is dedicated to the air force but shared by the army. (ISRO)

An official told *Shephard* that GSAT-7R would have better transponders, use the Ka-band 'and may go for the V band'.

Ex-IN spokesman DK Sharma said that GSAT-7R 'is very important. There are thousands of Chinese vessels that need to be surveyed, and we do not want a Philippines-type incident'. He was referring to Chinese encroachments in the Philippine EEZ at Whitsun Reef in March.

GISAT-1, India's first Earth observation satellite in geostationary orbit, will benefit the military by facilitating near real-time observation of the Indian subcontinent under cloud-free conditions at frequent intervals. The launch, delayed by over one year, is expected in 2021.

Military space missions require both defensive and offensive capabilities. For example, the Defence Research and Development Organisation is working on laser-based directed-energy weapons (DEW) for tactical air defence, anti-ballistic missile defence and anti-satellite (ASAT) applications. An official said offensive DEW capabilities require priority.

S Chandrashekhar of the National Institute of Advanced Studies Bengaluru said: 'Identifying areas to develop and strengthen technological capabilities to establish effective deterrence is the logical next step.'

Meanwhile, Anil Kumar Singh, country manager at DataPath India, told *Shephard*: 'India needs early-warning satellites to monitor intercontinental ballistic missile launches [ICBM] and even tactical airspace as an important military asset, and ground-/space-based lasers to disable enemy satellites or destroy/degrade attacking ICBMs as part of an ASAT [anti-satellite] capability.'

The Defence Space Agency recently invited proposals for space situational awareness solutions that can 'detect, identify and track enemy assets while also warning about any impending attacks'. The technology required must predict threats from ASAT weapons, space debris, DEW and RF interference.

DataPath supplies military-grade ground-portable antennas to the air force via Bharat Electronics. Chopra said 500-600 antennas were in the procurement pipeline, with 1.2m Ku band the most popular.

He remarked: 'Some are looking at the Ka-band that gives better bandwidth and speed… but procurement processes need to be speeded up.'

https://www.shephardmedia.com/news/defence-notes/india-ramps-military-satellite-plans/

Tue, 01 June 2021

Successful completion of 'Certificate Course in R&D Management for the Scientists of Naval Science & Technological Laboratory, Visakhapatnam/Defence Research & Development Organization (DRDO) in collaboration with Institute of Technology Management, DRDO'

The Indian Institute of Management Visakhapatnam (IIMV) has successfully conducted the Certificate Program in Research and Development (R&D) Management for the Scientists of Naval Science & Technological Laboratory (NSTL) / Defence Research and Development Organisation (DRDO). This Program was unique and first of its kind offered by IIMV jointly with Institute of Technology Management (ITM), DRDO. The Valedictory Program was conducted virtually on 26th May 2021. Shri K S Varaprasad, Distinguished Scientist & DG – HR, delivered the Valedictory address. Dr Samir V Kamat, Distinguished Scientist & DG – NS&M, Prof M Chandrasekhar, Director IIMV, Dr O R. Nandagopan, Director, NSTL and Shri Sanjay Tandon, Director, ITM have addressed during the Valedictory. Shri R Srihari, Scientist G, NSTL delivered the Welcome address. Prof B. Srirangacharyulu, Program Director and Prof Vinay Ramani also addressed the gathering.

The virtual event was attended by eminent dignitaries such as Sri Purusottam Bej, OS, Director, DFMM, Dr Sumit Goswami, Director, DP&C, Dr Mayank Dwivedi, Director, DIITM, Sri Shiv Kumar, Director, ER&IPR, Sri KK Pathak, Director, FTM, Dr Deepak Panda, Sc'F', ITM, Mussorie and Directors of NS&M Cluster Labs, Director (PM& Admin) and O/o DG (NS&M), DRDO.

The program was conducted in 3 batches for a total of 60 participants. There was a total of 10 modules in the program which focused on advanced skills in R&D Management, such as project management, planning and execution, and human resource development. The participants were given a 'Certificate in R&D Management' on successful completion of the program. Based on scholastic performance, Merit Certificates were also awarded to the participants. The program received excellent feedback from the participants.

https://iimv.ac.in/?view=article&id=420&catid=59

COVID 19: DRDO's Contribution

जागरण

Tue, 01 June 2021

मेरठ में पहले मरीज ने ली DRDO की 2-डीजी ग्लूकोज, रिपोर्ट निगेटिव; मेडिकल को अब जल्द मिलेगी 800 पैकेट दवा

कोरोना मरीजों के लिए चमत्कारी दवा बताई जा रही 2-डीजी मेडिकल कालेज के पहले मरीज को दे दी गई। सिंभावली निवासी कोविड संक्रमित मरीज को पांच पैकेट दवा दी गई है। जिसके बाद कोरोना निगेटिव पाया गया। शासन से आठ सौ पैकेट की मांग की गई है।

By Himanshu Dwivedi, संतोष शुक्ल

मेरठ: कोरोना मरीजों के लिए चमत्कारी दवा बताई जा रही 2-डीजी मेडिकल कालेज के पहले मरीज को दे दी गई। सिंभावली निवासी कोविड संक्रमित मरीज को पांच पैकेट दवा दी गई है। डाक्टरों का कहना है कि दवा के प्रभाव का चार्ट बनाकर अध्ययन किया जा रहा है। हालांकि कोरोना निगेटिव मिलने के बाद मरीज को इमरजेंसी वार्ड में भर्ती कर दिया गया है। मरीज की आक्सीजन में सुधार दर्ज किया गया है। मेडिकल कालेज ने शासन को पत्र लिखकर आठ सौ पैकेट 2-डीजी की डिमांड की है।

सिंभावली निवासी मरीज कोविड संक्रमण की वजह से 19 मई को वार्ड में भर्ती किया गया। आक्सीजन सेचुरेशन 82 तक पहुंच गई थी। डाक्टरों ने बताया कि मरीज को प्रोटोकाल की सभी दवाओं के साथ रेमडेसिविर इंजेक्शन भी दिया गया। इसी बीच मरीज ने मेडिकल कालेज प्रशासन से पत्र लिखवाकर डीआरडीओ से पांच पैकेट 2-डीजी दवा मंगवाई। डा. विशाल की अगुआई वाली टीम ने मरीज को 2-डीजी दवा सौ मिलीलीटर में घोलकर दी। कोविड वार्ड प्रभारी डा. धीरज बालियान ने बताया कि मरीज निगेटिव हो चुका है। आक्सीजन सेचुरेशन 82 से बढ़कर 90 फीसद तक पहुंच चुका है। अन्य मरीजों को दवा देने के बाद साफ होगा कि दवा कितनी कारगर रही। डा. धीरज ने कहा कि प्रदेश सरकार ने 2-डीजी दवा के लिए प्रस्ताव मांगा था। यहां से आठ सौ पैकेट की मांग की गई है।

वायरस की ऊर्जा रोक देती है दवा

डीआरडीओ और इंस्टीट्यूट आफ न्यूक्लियर मेडिसिन एंड एलाइड साइंस द्वारा विकसित दवा 2-डीजी करीब 15 दिन पहले लांच की गई थी। केंद्रीय रक्षा मंत्री राजनाथ सिंह एवं स्वास्थ्य मंत्री डा. हर्षवर्धन ने दवा को लांच करते हुए जल्द ही अस्पतालों में उपलब्ध कराने के लिए कहा था। हालांकि यह दवा न बाजार में उपलब्ध हुई, और न ही सरकारी अस्पतालों में उपलब्ध कराई जा सकी है। पहले खेप में हैदराबाद से दस हजार डोज दवा डीआरडीओ के अस्पतालों में भेजी गई। लेकिन राजकीय मेडिकल कालेजों को दवा नहीं मिल सकी है। मेडिकल कालेज के फिजिशियन डा. अरविंद ने बताया कि 2-डीजी हल्के गंभीर मरीजों के लिए बनाई गई है। यह दवा संक्रमित कोशिकाओं की पहचान कर उसकी ग्लूकोज लेने की क्षमता रोक देती है, ऐसे में वायरस बढ़ नहीं पाता है। मरीज तेजी से रिकवर करता है।

https://www.jagran.com/uttar-pradesh/meerut-city-meerut-news-first-patient-in-meerut-medical-college-took-2-dg-glucose-and-his-corona-reported-found-for-negative-demand-of-800-packets-21694218.html

THE HINDU

Tue, 01 June 2021

Oxygen plant functional at Parippally MCH

13 plants being constructed by NHAI in State

Thiruvananthapuram: The first of the 13 oxygen plants constructed by the National Highways Authority of India (NHAI) in the State has become functional at Government Medical College Hospital at Parippally in Kollam.

The additional pressure swing adsorption (PSA) medical oxygen generation plant has a generation capacity of 1,000 litres per minute (lpm).

While the project implementation unit (PIU) of the NHAI was in charge of civil and electrical works of the plant, the Defence Research and Development Organisation did the installation works. The PIU Thiruvananthapuram is also working on the plant at Government Women and Children Hospital in Alappuzha. The machinery has arrived and the plant is expected to be functional next week.

The PIU has also commenced works on the plant at Government General Hospital, Neyattinkara. The infrastructure for setting up the plant is to be completed in seven days.

The civil and electrical works of the plant at Government Hospital in Pala is by the Central Public Works Department.

The service of RDS-CVCC, contractor for the Kazhakuttam elevated highway along NH 66, was used for executing the civil and electrical works for the plants at Parippally and Alappuzha.

"The works were hindered by factors such as lockdown, Tauktae Cyclone, and the pandemic. Special permission was obtained from District Collectors for opening shops for procuring material and substitute labourers were used to complete the works," a project official said.

The plants are part of a Ministry of Health & Family Welfare initiative to set up additional PSA medical oxygen generation plants in public health facilities to ensure smooth availability of medical oxygen.

The Ministry is setting up 72 plants with 500 and 1,000 lpm plants and 52 plants in the second phase.

Kerala will get 13 plants and six locations have been identified. The funds are being made available from PM Cares.

For installing plants, the State has to ensure land, power supply, supply backup, and pipeline system. Besides, two technical persons from the hospital should be deputed to manage the plant and a nodal officer for coordination by the State.

https://www.thehindu.com/news/national/kerala/oxygen-plant-functional-at-parippally-mch/article34692971.ece

अमर उजाला

Tue, 01 June 2021

जम्मू-कश्मीर: श्रीनगर में डीआरडीओ अस्पताल का काम पांच जून तक पूरा करने की समय सीमा तय

सार

राज्यपाल ने कहा कि उनका फोकस उच्च गुणवत्ता की स्वास्थ्य सुविधाएं उपलब्ध कराने की है। लोगों की जान से बढ़कर कुछ भी नहीं है। प्रशासन दिन-रात प्रदेश के सभी कोनों और सभी लोगों तक बेहतर स्वास्थ्य सुविधाएं उपलब्ध कराने में जुटा हुआ है।

विस्तार

उप-राज्यपाल मनोज सिन्हा ने श्रीनगर के खोनमुह में बन रहे 500 बेड के डीआरडीओ अस्पताल का दौरा कर पांच जून तक काम पूरा करने की समय सीमा तय की। इसी दिन से सभी सुविधाओं का ट्रायल रन होगा। इसके साथ ही इसमें 25 बेड के बच्चों के लिए आईसीयू चिकित्सकों व नर्स के साथ तैयार करने की हिदायत दी।

डीआरडीओ अस्पताल - फोटो: अमर उजाला, फाइल फोटो

निर्माण कार्यों की समीक्षा करते हुए उप-राज्यपाल ने कहा कि काम पांच जून तक पूरा कर लिया जाए ताकि सभी सुविधाओं का इस दिन से ट्रायल रन शुरू हो सके। नवजात और बच्चों के लिए क्रिटिकल केयर की सुविधा मुहैया कराने के लिए उन्होंने 25 बेड का आईसीयू बनाने को कहा। स्टाफ, दवाओं व उपकरणों की आपूर्ति, जांच के उपकरण और अन्य सुविधाएं समय पर उपलब्ध कराना सुनिश्चित करने को कहा। उन्होंने निर्माणाधीन अस्पताल का दौरा कर आईसीयू बेड, ट्राइएज सुविधा, स्वास्थ्य उपकरणों, डॉक्टर, पैरामेडिकल स्टाफ और अन्य सुविधाओं के बारे में जानकारी हासिल की।

जम्मू-श्रीनगर में डीआरडीओ अस्पताल से स्वास्थ्य सुविधाएं होंगी बेहतर

अस्पताल में 125 बेड का आईसीयू होगा। इसके साथ ही 375 बेड ऑक्सीजन की सुविधा से लैस होंगे। उप-राज्यपाल ने सीटी स्कैन और अन्य जांच सुविधाएं भी अस्पताल में उपलब्ध कराने को कहा। कहा कि दोनों शहरों में डीआरडीओ अस्पताल के खुल जाने से कोरोना जैसी बीमारियों से जंग के लिए स्वास्थ्य सुविधाएं उपलब्ध हो जाएंगी। 29 मई को उप-राज्यपाल ने जम्मू में डीआरडीओ अस्पताल लोकार्पित किया था। उप-राज्यपाल के साथ प्रमुख सचिव नीतीश्वर कुमार, मंडलायुक्त पीके पोल समेत अन्य अधिकारी उपस्थित थे।

https://www.amarujala.com/jammu/jammu-kashmir-news-deadline-for-completion-of-drdo-hospital-in-srinagar-by-five-june?pageId=1

NEWS TODAY NETWORK

Tue, 01 June 2021

हल्द्वानी- सांसद भट्ट ने किया डीआरडीओ द्वारा निमित अस्पताल का निरीक्षण, रक्षामंत्री कर सकते है शुभारंभ

By jiwan Lal

हल्द्वानी: सोमवार को सांसद अजय भट्ट ने राजकीय मेडिकल कालेज में डीआरडीओ द्वारा बनाये जा रहे 500 बेड के फैब्रीकेटेड चिकित्सालय एंव ऑक्सीजन प्लांट का निरीक्षण किया। उन्होने कहा कि चिकित्सालय का निर्माण कार्य पूर्ण हो चुका है मंगलवार को इस फैब्रीकेटेड चिकित्सालय का शुभारम्भ करने हेतु रक्षामंत्री से अनुरोध किया गया है, इस चिकित्सालय का रक्षामंत्री राजनाथ सिंह दिल्ली से ही वर्चुवल लोकापर्ण कर सकते है।

सांसद भट्ट ने कहा कि हम तीसरी कोरोना लहर से निपटने के लिए तैयार है चिकित्सालय का कार्य पूर्ण हो चुका है इसमे वैन्टीलेटर व आईसीयू बेड तैयार हो गये है चिकित्सालय सभी सुविधाओ से लैस हो चुका है यह चिकित्सालय क्षेत्र के लिए ही नही पूरे कुमाऊॅ के लिए मील का पत्थर साबित होगा। इस सुविधायुक्त फैब्रीकेटेड चिकित्सालय निर्माण हेतु उन्होने प्रधानमंत्री, रक्षामंत्री व मुख्यमंत्री का आभार व्यक्त किया। उन्होने चिकित्सालय निर्माण हेतु डीआरडीओ व जिला प्रशासन को बधाई दी।

इसके उपरान्त सांसद भट्ट ने महिला बेस चिकित्सालय में नये भवन के पीछे निर्माणाधीन ऑक्सीजन प्लान्ट का निरीक्षण किया व अधिकारियों निर्माण कार्य शीघ्र पूर्ण करने के निर्देश दिये।निरीक्षण दौरान मुख्य विकास अधिकारी नरेन्द्र सिंह भण्डारी, मुख्य चिकित्साधिकारी डाॅ. भागीरथी जोशी, प्राचार्य डाॅ.सीपी भैसोडा, चिकित्साधीक्षक डा. अरूण जोशी, मुख्य चिकित्साधीक्षक महिला चिकित्सालय डा. उषा जंगपांगी, डीआरडीओ के कोनेरू मेघा सांई, कर्नल डी अंत्रे, सिटी मजिस्टे्रट प्रत्यूष सिंह, जिला अध्यक्ष भाजपा प्रदीप बिष्ट, प्रदेश प्रवक्ता प्रकाश रावत, प्रकाश हर्बोला, लक्षमण सिंह खाती, विनीत अग्रवाल, बालम बिष्ट, प्रतिभा जोशी, लाखन निगल्टिया आदि मौजूद थे।

https://newstodaynetwork.com/uttarakhand/kumaon/haldwani-mp-bhatt-inspected-the-hospital-built-by-drdo/cid3092278.htm

The Shillong Times

Tue, 01 June 2021

Talks on DRDO's COVID-19 drug

Shillong: The Shiksha Sanskriti Utthan Nyas, North-East, recently organised an inaugural lecture of a national expert commentary series on COVID-19.

According to a statement, the lecture dwelt at length about 2-DG, a drug developed by the Defence Research and Development Organisation (DRDO) against COVID-19.

The lecture was moderated by Dr. Timir Tripathi, Regional Patron, SSUN, SP, North East. He also presented the preface of SSUN. Prof. Hitendra Mishra, North Eastern Hill University, Shillong, on the other hand, gave the welcome address.

Dr. Anant Narayan Bhatt (Scientist), Division of Radiation Biosciences, Institute of Nuclear Medicine and Allied Sciences (INMAS), DRDO, during the lecture showed how the 2-DG works against COVID-19.

"He showed 2-DG was able to halt the growth of the virus and result in reduced recovery time of patients. He also informed that full support from the Government of India was offered to develop this drug," the statement said.

https://theshillongtimes.com/2021/06/01/talks-on-drdos-covid-19-drug/

Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Mon, 31 May 2021 7:15PM

Vice Admiral Kiran Deshmukh, AVSM, VSM, assumes charge as the Controller Warship Production and Acquisition

Vice Admiral Kiran Deshmukh, AVSM, VSM, has assumed charge as the Controller Warship Production and Acquisition on 31 May 21. Vice Admiral Kiran Deshmukh, who is alumnus of VJTI, University of Mumbai, was commissioned as an Engineer Officer into the Indian Navy on 31 March 86. He holds a Master degree in Engineering and is a post graduate from Defence Services Staff College, Wellington. The Flag Officer has held various important appointments in the Staff, Personnel and Materiel Branch at Naval Headquarters, trial agencies, MO, Naval Dockyard and Command staff at HQENC. The Flag Officer has served onboard frontline ships like Rajput Class, Delhi Class and Tabar Class in various capacities. The Admiral is a recipient of the AtiVisishtSeva Medal and VisishtSeva Medal for his distinguished service. Prior to his appointment as Controller Warship Production & Acquisition, as Flag Officer he has served as Director General Naval Project at Visakhapatnam, Admiral Superintendent of Naval Dockyard Visakhapatnam, Chief Staff Officer (Tech)/ HQENC and Assistant Chief of Material (Dockyards & Refits).

https://pib.gov.in/PressReleasePage.aspx?PRID=1723202

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Mon, 31 May 2021 7:15PM

वाइस एडमिरल किरण देशमुख, एवीएसएम, वीएसएम ने कंट्रोलर वॉरशिप प्रोडक्शन एंड एक्विजिशन (युद्धपोत उत्पादन और अधिग्रहण नियंत्रक) के पद का कार्यभार ग्रहण किया

वाइस एडमिरल किरण देशमुख, एवीएसएम, वीएसएम ने 31 मई 2021 को युद्धपोत उत्पादन और अधिग्रहण नियंत्रक के पद का कार्यभार ग्रहण किया। वीजेटीआई, मुंबई विश्वविद्यालय के पूर्व छात्र, वाइस एडमिरल किरण देशमुख को 31 मार्च, 1986 को भारतीय नौसेना में इंजीनियर अधिकारी के रूप में नियुक्त किया गया था। उन्होंने इंजीनियरिंग में मास्टर डिग्री प्राप्त की है और वे डिफेंस सर्विसेज स्टाफ कॉलेज, वेलिंगटन से पोस्ट ग्रेजुएट हैं। फ्लैग ऑफिसर ने नौसेना मुख्यालय में स्टाफ, कार्मिक और उपकरण शाखा जैसी प्रमुख नियुक्तियों पर और पूर्वी नौसेना कमान मुख्यालय में परीक्षण एजेंसियों, एमओ, नौसेना डॉकयार्ड तथा कमांड स्टाफ में विभिन्न महत्वपूर्ण पदों पर कार्य किया है। फ्लैग ऑफिसर ने विभिन्न क्षमताओं में राजपूत क्लास, दिल्ली क्लास और तबर क्लास जैसे फ्रंटलाइन पोतों पर सेवाएं दी हैं। एडमिरल को उनकी विशिष्ट सेवा के लिए अति विशिष्ट सेवा पदक और विशिष्ट सेवा पदक से सम्मानित किया गया है। कंट्रोलर वॉरशिप प्रोडक्शन एंड एक्विजिशन, फ्लैग ऑफिसर के रूप में अपनी नियुक्ति से पहले, उन्होंने विशाखापत्तनम में डायरेक्टर जनरल नेवल प्रोजेक्ट, नेवल डॉकयार्ड विशाखापत्तनम के एडमिरल सुपरिंटेंडेंट, चीफ स्टाफ ऑफिसर (तकनीकी) / एचक्यूईएनसी और असिस्टेंट चीफ ऑफ मैटेरियल (डॉकयार्ड एंड रिफिट्स) के रूप में काम किया है।

https://pib.gov.in/PressReleasePage.aspx?PRID=1723246

Press Information Bureau
Government of India

Ministry of Defence

Mon, 31 May 2021 5:53PM

Lt Gen Manoj Pande relinquishes Command of Andaman & Nicobar Command

Lt Gen Manoj Pande, the 15thCommander-in-Chief of Andaman and Nicobar Command (CINCAN), relinquished the command of the only tri-services operational command of the Armed Forces on May 31, 2021, following his appointment as the General Officer Commanding-in-Chief, Eastern Army Command with effect from June 01, 2021. On the eve of relinquishing command, the CINCAN called on Lt Governor Andaman and Nicobar Islands, Admiral DK Joshi (Retd) to bid farewell and express gratitude to him and the Union Territory (UT) administration for the support and cooperation during his tenure at the ANC. He assured the Lt Governor that ANC will continue to extend full support to the UT administration as and when required.

In his farewell address, the CINCAN highlighted the present and emerging security challenges and complimented all ranks for maintaining a very high level of operational readiness despite the COVID pandemic. He emphasised on the importance of synergy amongst the three services and Indian Coast Guard to achieve desired operational outcome.He later inspected the Joint Forces Guard of Honour at INS Utkrosh.

Under the General Officer's command, during this last one year, the ANC has significantly enhanced the operational preparedness and successfully conducted a number of major Tri-Service operational exercises, BrahMos missile firing and joint exercises with foreign Navies. The Command also conducted a unique joint operational exercise during the visit of President of India Shri Ram Nath Kovind in March 2021. Emphasis was also given to speed up ongoing infrastructure works at Port Blair and other outlaying stations such as Shibpur, Car Nicobar, Kamorta and Campbell Bay.The General Officer has remained at the forefront of efforts to harmonise the working relationship with civil administration and the people of the Islands.

https://pib.gov.in/PressReleasePage.aspx?PRID=1723161

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Mon, 31 May 2021 5:53PM

लेफ्टिनेंट जनरल मनोज पांडे ने अंडमान और निकोबार कमांड की कमान छोड़ी

अंडमान और निकोबार कमांड के 15वें कमांडर-इन-चीफ (सीआईएनसीएएन) लेफ्टिनेंट जनरल मनोज पांडे ने पूर्वी सेना कमान के जनरल ऑफिसर कमांडिंग-इन-चीफ के रूप में अपनी नियुक्ति के बाद 31 मई 2021 को सशस्त्र बलों की एकमात्र त्रि-सेवा संचालन कमांड की कमान छोड़ दी है। उनकी नई नियुक्ति पहली जून 2021 से प्रभावी होगी। कमान छोड़ने की पूर्व संध्या पर, सीआईएनसीएएन ने अंडमान और निकोबार द्वीप समूह के उपराज्यपाल एडमिरल डीके जोशी (सेवानिवृत्त) को विदाई देने तथा अंडमान और निकोबार कमांड (एएनसी) में अपने कार्यकाल के दौरान समर्थन तथा सहयोग का आभार व्यक्त करने के लिए आमंत्रित किया। इस दौरान केंद्र शासित प्रदेश के प्रशासन को भी बुलाया गया। उन्होंने उपराज्यपाल को आश्वासन दिया कि, एएनसी जरूरत पड़ने पर केंद्र शासित प्रदेश प्रशासन को अपनी सहायता देना जारी रखेगी।

अपने विदाई भाषण में, लेफ्टिनेंट जनरल मनोज पांडे ने वर्तमान और उभरती सुरक्षा चुनौतियों पर प्रकाश डाला तथा कोविड महामारी के बावजूद उच्च स्तर की परिचालन तत्परता बनाए रखने के लिए सभी रैंकों की सराहना की। उन्होंने वांछित परिचालन परिणाम प्राप्त करने के लिए तीनों सेवाओं एवं भारतीय तटरक्षक बल के बीच और बेहतर तालमेल के महत्व पर जोर दिया। बाद में, उन्होंने आईएनएस उत्क्रोश में ज्वाइंट फोर्सेज गार्ड ऑफ ऑनर का निरीक्षण किया।

जनरल ऑफिसर की कमान के तहत पिछले एक वर्ष के दौरान, एएनसी ने परिचालन तैयारियों में काफी वृद्धि की है और सफलतापूर्वक कई प्रमुख त्रि-सेवा संचालन अभ्यास, ब्रह्मोस मिसाइल फायरिंग तथा विदेशी नौसेनाओं के साथ संयुक्त अभ्यास किया है। मार्च 2021 में राष्ट्रपति श्री राम नाथ कोविंद की यात्रा के दौरान कमान ने एक अद्वितीय संयुक्त अभियान अभ्यास किया था। पोर्ट ब्लेयर और अन्य बाहरी स्टेशनों जैसे शिबपुर, कार निकोबार, कामोर्टा एवं कैंपबेल बे में चल रहे बुनियादी ढांचे के कार्यों में तेजी लाने पर भी जोर दिया गया। जनरल ऑफिसर नागरिक प्रशासन और द्वीप के लोगों के साथ कामकाजी संबंधों में सामंजस्य स्थापित करने के प्रयासों में सबसे आगे रहे हैं।

https://pib.gov.in/PressReleasePage.aspx?PRID=1723224

Outlook

Tue, 01 June 2021

Indian naval operation during 1971 Indo-Pak war still carries valuable lessons: Navy Chief

New Delhi: The core tenets of planning, decisive action, operational synchronisation and out-of-the-box thinking by the Indian Navy during the 1971 war still carry valuable lessons for the future, Chief of Naval Staff Admiral Karambir Singh said on Monday.

The Navy chief said the tactical ingenuity, the deployment of available combat power and detailed planning of naval aspects of the war proved crucial in shaping the land battle.

Admiral Singh was speaking at a webinar organised by the Indian High Commission in London to recount the Indian naval attack on the Karachi harbour.

"The 1971 war was most significant as it led to the birth of a new nation, Bangladesh, a seminal geopolitical event," he said

"Though half a century has passed since this event, the core tenets of planning, decisive action, operational synchronisation and out-of-the-box thinking epitomised by the naval operation during the 1971 war hold true even today and carry valuable lessons for the future," the Navy Chief said.

Navy Day is celebrated every year on December 4 to commemorate the Indian Navy"s achievement in inflicting heavy damage on Pakistani vessels at Karachi harbour during the India-Pakistan war in 1971.

Admiral Singh said the Indian Navy considers the operation as historically and militarily significant.

"The 1971 Indo-Pak war was indeed a landmark event which shaped the course of not just India"s history but also altered the geography of the South Asian subcontinent," he said.

"The maritime facets of the war marked the Indian Navy"s coming of age and established its credentials as a force to reckon with," he added.

Admiral Singh said the Indian Navy executed an array of offensive and defensive operations on both its seaboards, effectively neutralising the adversary"s ability to use the seas for combat, sustenance, replenishment and evacuation.

(Disclaimer: This story has not been edited by Outlook staff and is auto-generated from news agency feeds. Source: PTI)

https://www.outlookindia.com/newsscroll/indian-naval-operation-during-1971-indopak-war-still-carries-valuable-lessons-navy-chief/2093599

THE HINDU

Tue, 01 June 2021

Rear Admiral I.B. Uthaiah takes over as Admiral Superintendent, Naval Dockyard

Visakhapatnam: Rear Admiral I.B. Uthaiah took over as the Admiral Superintendent, Naval Dockyard, Visakhapatnam. from Rear Admiral Sreekumar Nair, here on Monday.

Rear Admiral I.B. Uthaiah, was commissioned into the Indian Navy in November 1987.

He holds a B.Tech. degree in Marine Engineering, an M.Tech. degree in Mathematical Modelling and Computer Simulation and an M.Phil. degree in Strategic Studies.

In his 33 years of service, the Rear Admiral has served the Indian Navy in various capacities, with appointments at the Warship Design Directorate, Training Academies, Naval Dockyard and at the Command and Naval Headquarters.

His key staff appointments cover areas of Warship Design, Building, and Acquisition; Warship Operation, Maintenance and Repair, Officer Training and Project Management of a mega Marine and Civil Infrastructure Project.

His recent operational and staff appointments include General Manager (Refit) at Naval Dockyard, Visakhapatnam, and Principal Director (Ship Production).

On being elevated to the rank of Rear Admiral, the officer was appointed as Additional Director General (Technical) at Headquarters, Project Seabird.

The mega project involves the creation of a futuristic Naval Base at Karwar, with four self-contained townships, a Naval Air station, and a 400-bed tertiary care hospital.

An alumnus of the Naval War College, he was awarded the Vishist Seva Medal (VSM) for distinguished service at Naval Dockyard and was instrumental in concluding major warship construction contracts with Russian and Indian Shipyards as Principal Director.

Rear Admiral Sreekumar Nair, would take over as Director General Naval Project at Visakhapatnam, on being promoted as Vice Admiral.

https://www.thehindu.com/news/national/andhra-pradesh/rear-admiral-ib-uthaiah-takes-over-as-admiral-superintendent-naval-dockyard/article34690135.ece

Tue, 01 June 2021

China's air defense system inferior to Russia's S-400

China has been procuring various Soviet-designed defense system like S-400s or S-300 and developed an updated version of those, which is less capable than provided by the original Russian product

Beijing: China has been procuring various Soviet-designed defense system like S-400s or S-300 and developed an updated version of those, which is less capable than provided by the original Russian product. Russia's seeming lack of worry may suggest that the HQ-9 is less capable enough relative to original S-400s or S-300PMUs to not really have much competition.

The National Interest reported that the Chinese industry doesn't really have a "bottleneck" or a specific part that is known to be inferior relative to the Russian product. The HQ-9 is China's primary long-range domestic surface-to-air missile. Outwardly, it seems similar to the S-300, using large flat face radars and a large missile that vertically launches out of a canister. But since the Sino-Soviet split in the 1950s, China didn't receive that much assistance in surface-to-air missile development from the Soviet Union.

Representative Image. Image Credit: ANI

At the time of split, China's only true long-range SAM was the S-75 (SA-2). Work proceeded on various medium and short-range SAMs such as the HQ-61 and HQ-6. However, as China began modernising its military fully in the 1990s there was a lack of a true mobile long-range SAM such as the Patriot or S-300, both of which entered service in the United States and Russia in the 1980s. According to National Interest, these missiles (S-400s or S-300) underwent significant reverse engineering and solutions from them were applied to the domestic HQ-9 missile. While Chinese sources credit Chinese engineers with developing the HQ-9 on their own.

The procurement of the S-300 prior to the first IOC of the HQ-9 suggests otherwise. Western sources tend to support the Russian point of view, stating that "The HQ-9 family of missiles are clearly derived from the Russian S-300PMU." The HQ-9 reached initial operational capability some time later (Chinese sources state 1995), and has been continuously modernized since. The acquisition of S-300PMU-2 missiles in 2004 provided further resources for China to develop the HQ-9. The current acquisition of S-400s in 2018 probably will contribute further towards the development of the HQ-9.

As a result of these developments, a myriad of variants of the HQ-9 have been developed. The HQ-9A was the first major deployed upgrade, which added additional anti-ballistic capability through improved electronics. The HQ-9B is said to improve range, possibly out to around 250 or even 300 kilometers. The HQ-9 is said to have been deployed to islands on the South China Sea, as per the Magazine. (ANI)

https://www.devdiscourse.com/article/international/1594228-chinas-air-defense-system-inferior-to-russias-s-400

Press Information Bureau
Government of India

Ministry of Science & Technology

Mon, 31 May 2021 4:38PM

Scientists develop efficient Artificial Synaptic Network that mimics human brain

Scientists have fabricated a device that can mimic human brain cognitive actions and is more efficient than conventional techniques in emulating artificial intelligence, thus enhancing the computational speed and power consumption efficiency.

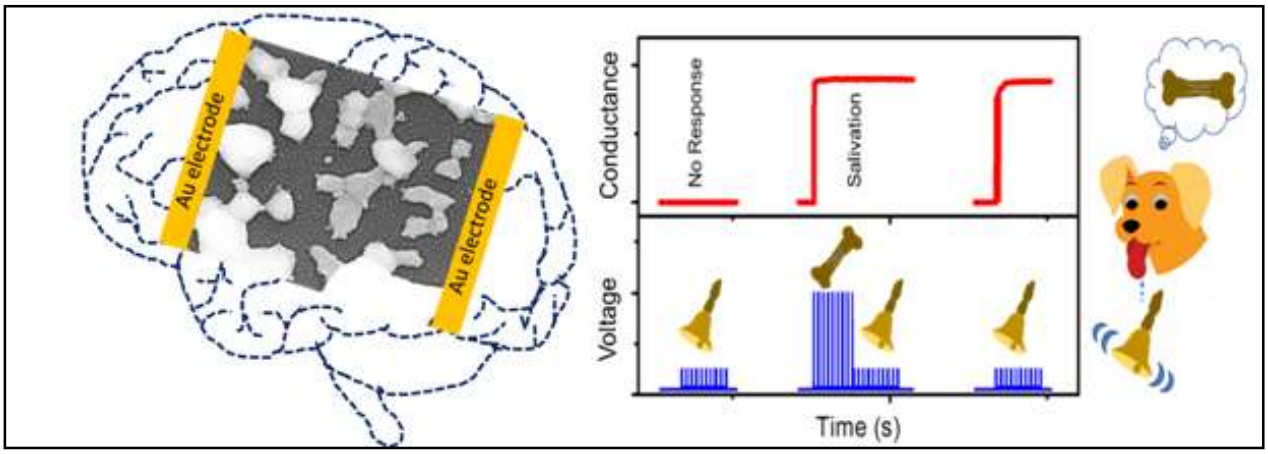


Figure: Scanning electron microscope image of the artificial synaptic network device resembling a bio-neural network. Associative learning is demonstrated by emulating Pavlov's dog, where post-training the dog salivates by hearing the bell.

Artificial intelligence is now a part of our daily lives, starting from email filters and smart replies in communication to helping battle the Covid-19 pandemic. But AI can do much more such as facilitate self-driving autonomous vehicles, augmented reality for healthcare, drug discovery, big data handling, real-time pattern/image recognition, solving real-world problems, and so on. These can be realised with the help of a neuromorphic device which can mimic the human brain synapse to bring about brain-inspired efficient computing ability. The human brain comprises of nearly a hundred billion neurons consisting of axons and dendrites. These neurons massively interconnect with each other via axons and dendrites, forming colossal junctions called synapse. This complex bio-neural network is believed to give rise to superior cognitive abilities.

Software-based artificial neural networks (ANN) can be seen defeating humans in games (AlphaGo and AlphaZero) or helping handle the Covid-19 situation. However, the power-hungry (in megawatts) von Neumann computer architecture slows down ANNs performance due to the available serial processing while the brain does the job via parallel processing consuming just 20 W. It is estimated that the brain consumes 20% of the total body energy. From the calory conversion (https://hypertextbook.com/facts/2001/JacquelineLing.shtml), it amounts to 20 watts. While the conventional computing platforms consume megawatts, i.e., 10 lakh watts of energy, to mimic basic human cognition.

To overcome this bottleneck, a hardware-based solution involves an artificial synaptic device that, unlike transistors, could emulate the functions of human brain synapse. Scientists had long been trying to develop a synaptic device that can mimic complex psychological behaviors without the aid of external supporting (CMOS) circuits.

To address this challenge, Scientists from Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru, an autonomous institute of the Department of Science & Technology, Government of India, devised a novel approach of fabricating an artificial synaptic network (ASN) resembling the biological neural network via a simple self-forming method (the device structure is formed by itself while heating). This work has been recently published in the journal 'Materials Horizons'.

Aiming to develop a synaptic device for neuromorphic applications with a humble fabrication method, the JNCASR team explored a material system mimicking neuronal bodies and axonal network connectivity much like the biological system. In order to realize such a structure, they found that a self-forming process was easy, scalable, and cost-effective.

In their research JNCASR team dewetted Silver (Ag) metal to form branched islands and nanoparticles with nanogap separations to resemble bio neurons and neurotransmitters where dewetting is a process of rupture of continuous film into disconnected/isolated islands or spherical particles. With such an architecture, several higher-order cognitive activities are emulated. The fabricated artificial synaptic network (ASN) consisted of Silver (Ag) agglomerates network separated by nanogaps filled with isolated nanoparticles. They found that dewetting Ag film at a higher temperature resulted in the formation of island structures separated by nanogaps resembling the bio-neural network.

Using programmed electrical signals as a real-world stimulus, this hierarchical structure emulated various learning activities such as short-term memory (STM), long-term memory (LTM), potentiation, depression, associative learning, interest-based learning, supervision, etc. impression of supervision. Synaptic fatigue due to excessive learning and its self-recovery was also mimicked. Remarkably, all these behaviors were emulated in a single material system without the aid of external CMOS circuits. A prototype kit has been developed to emulate Pavlov's dog behavior which demonstrates the potential of this device towards neuromorphic artificial intelligence. By organizing a nanomaterial resembling the biological neural substance, the JNCASR team has moved a step further in accomplishing advanced neuromorphic artificial intelligence.

"Nature has had an incredible amount of time and diversity to engineer ever new forms and functions through evolution. Learning and emulating new processes, technologies, materials and devices from the nature and biology are the important pathways to the significant advances of the future which will increasingly integrate the worlds of the living with the man-made technologies," said Prof Ashutosh Sharma, Secretary, DST.

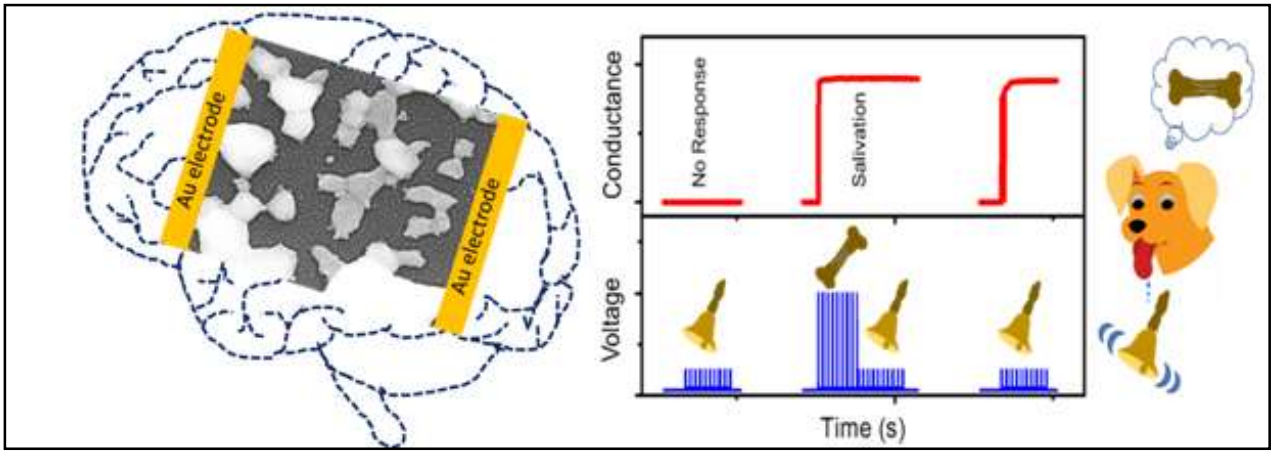
https://pib.gov.in/PressReleasePage.aspx?PRID=1723138

पत्र सूचना कार्यालय
भारत सरकार
विज्ञान एवं प्रौद्योगिकी मंत्रालय

Mon, 31 May 2021 4:38PM

वैज्ञानिकों ने मानव मस्तिष्क की नकल करने वाला कुशल आर्टिफिशियल सिनैप्टिक नेटवर्क विकसित किया

वैज्ञानिकों ने एक ऐसा उपकरण बनाया है जो मानव मस्तिष्क की ज्ञान से संबंधित क्रियाओं की नकल कर सकता है और आर्टिफिशियल इंटेलिजेंस की तरह काम करने में पारंपरिक तकनीकों की तुलना में अधिक कुशल है, इस प्रकार कम्प्यूटेशनल गति और ऊर्जा की खपत दक्षता को बढ़ाता है।



कृत्रिम सिनैप्टिक नेटवर्क डिवाइस की इलेक्ट्रॉन माइक्रोस्कोप छवि की स्कैनिंग बायो-न्यूरल नेटवर्क के समान है जैसा कि पावलोव के कुत्ते का अनुकरण करके सहयोग शिक्षा का प्रदर्शन किया जाता है, जहां प्रशिक्षण के बाद कुत्ता घंटी सुनकर लार टपकाता है।

आर्टिफिशियल इंटेलिजेंस अब हमारे दैनिक जीवन का एक हिस्सा है, जो ईमेल फिल्टर और संचार में स्मार्ट जवाबों से प्रारंभ होकर कोविड-19 महामारी से लड़ने में सहायता करता है। लेकिन आर्टिफिशियल इंटेलिजेंस सेल्फ-ड्राइविंग ऑटोनॉमस व्हीकल्स, स्वास्थ्य सेवा के लिए संवर्धित रियलिटी, ड्रग डिस्कवरी, बिग डेटा हैंडलिंग, रियल-टाइम पैटर्न/ इमेज पहचान, रियल-वर्ल्ड की समस्याओं को हल करने जैसा बहुत कुछ कर सकता है। इनका अहसास एक न्यूरोमॉर्फिक उपकरण की सहायता से किया जा सकता है जो मस्तिष्क से प्रेरित कुशल कंप्यूटिंग क्षमता प्राप्ति के लिए मानव मस्तिष्क ढांचे की नकल कर सकता है। मानव मस्तिष्क में लगभग सौ अरब न्यूरॉन्स होते हैं जिनमें अक्षतंतु और डेंड्राइट होते हैं। ये न्यूरॉन्स बड़े पैमाने पर एक दूसरे के साथ अक्षतंतु और डेंड्राइट के माध्यम से जुड़ते हैं, जो सिनैप्स नामक विशाल जंक्शन बनाते हैं। माना जाता है कि यह जटिल जैव-तंत्रिका नेटवर्क ज्ञान संबंधी बेहतर क्षमताएं देता है।

सॉफ्टवेयर-आधारित कृत्रिम तंत्रिका नेटवर्क (एएनएन) को खेलों (अल्फागो और अल्फाज़ेरो) में मनुष्यों को हराते हुए या कोविड -19 स्थिति को संभालने में मदद करते हुए देखा जा सकता है। लेकिन पावर-हंग्री (मेगावाट में) वॉन न्यूमैन कंप्यूटर आर्किटेक्चर उपलब्ध सीरियल प्रोसेसिंग के कारण एएनएन के प्रदर्शन को धीमा कर देता है, जबकि मस्तिष्क समानांतर प्रसंस्करण के माध्यम से केवल 20 वाट्स की खपत करता है। यह अनुमान लगाया गया है कि मस्तिष्क शरीर की ऊर्जा का कुल का 20% खपत करता है। कैलोरी के रूपांतरण (https://hypertextbook.com/facts/2001/JacquelineLing.shtml) से यह 20 वाट

है जबकि परंपरागत कंप्यूटिंग प्लेटफॉर्म बुनियादी मानव ज्ञान की नकल करने के लिए मेगावाट, यानी 10 लाख वाट ऊर्जा की खपत करते हैं।

इस बाधा को दूर करने के लिएएक हार्डवेयर आधारित समाधान में एक कृत्रिम सिनैप्टिक उपकरण शामिल होता है, जो ट्रांजिस्टर के विपरीत, मानव मस्तिष्क सिनैप्स के कार्यों का अनुकरण कर सकता है। वैज्ञानिक लंबे समय से एक सिनैप्टिक डिवाइस विकसित करने का प्रयास कर रहे थे जो बाहरी सपोर्टिंग (सीएमओएस) सर्किट की सहायता के बिना जटिल मनोवैज्ञानिक व्यवहारों की नकल कर सकता है।

इस चुनौती के समाधान के लिए भारत सरकार के विज्ञान और प्रौद्योगिकी विभाग के अंतर्गत काम करने वाली स्वायत्त संस्था जवाहरलाल नेहरू सेंटर फॉर एडवांस्ड साइंटिफिक रिसर्च (जेएनसीएएसआर), बेंगलुरु के वैज्ञानिकों ने एक सरल स्व-निर्माण विधि के माध्यम से (उपकरण संरचना गर्म करते समय स्वयं द्वारा बनाई जाती है) जैविक तंत्रिका नेटवर्क जैसा एक कृत्रिम सिनैप्टिक नेटवर्क (एएसएन) बनाने का एक नया दृष्टिकोण तैयार किया। यह उपलब्धि 'मेटिरियल्स होराइजन्स' पत्रिका में हाल में प्रकाशित हुई है।

फैब्रिकेशन विधि से न्यूरोमॉर्फिक एप्लीकेशनों के लिए एक सिनैप्टिक उपकरण विकसित करने के उद्देश्य सेजेएनसीएएसआर की टीम ने जैविक प्रणाली की तरह न्यूरोनल निकायों और एक्सोनल नेटवर्क कनेक्टिविटी की नकल करने वाली मेटिरियल सिस्टम की खोज की। ऐसी संरचना साकार करने के लिए उन्होंने पाया कि एक स्व-निर्माण प्रक्रिया आसान, मापनीय और लागत प्रभावी थी।

अपने शोध में जेएनसीएएसआर टीम ने सिल्वर (एजी) धातु को शाखायुक्त द्वीपों और नैनोकणों को नैनोगैप पृथक्कीकरण के साथ जैव न्यूरॉन्स और न्यूरोट्रांसमीटर के समान बनाने के लिए तैयार किया जहां डीवेटिंग डिस्कनेक्ट/पृथक द्वीपों या गोलाकार कणों में फिल्म के टूटने की प्रक्रिया निरंतर होती है। ऐसे आर्किटेक्चर के साथ उच्च किस्म की अनेक ज्ञानात्मक गतिविधियों का अनुकरण किया जाता है। फैब्रिकेटेड कृत्रिम सिनैप्टिक नेटवर्क (एएसएन) में सिल्वर (एजी) एग्लोमेरेट्स नेटवर्क शामिल हैं, जो अलग-अलग नैनोकणों से भरे नैनोगैप्स द्वारा पृथक किया गया है। उन्होंने पाया कि उच्च तापमान पर एजी फिल्म को गीला करने से जैव-तंत्रिका नेटवर्क से मिलते-जुलते नैनोगैप्स द्वारा अलग किए गए द्वीप संरचनाओं का निर्माण हुआ।

प्रोग्राम किए गए विद्युत संकेतों का एक रियल वर्ल्ड स्टिमुलस के रूप में उपयोग करते हुए इस वर्गीकृत संरचना ने सीखने की विभिन्न गतिविधियों जैसे कि अल्पकालिक स्मृति (एसटीएम), दीर्घकालिक स्मृति (एलटीएम), क्षमता, अवसाद, सहयोगी शिक्षा, रुचि-आधारित शिक्षा, पर्यवेक्षण का अनुकरण किया। अत्यधिक सीखने के कारण सिनैप्टिक थकान और इसकी आत्म-सुधार की भी नकल की गई। उल्लेखनीय रूप से इन सभी व्यवहारों का अनुसरण एकल मेटिरियल सिस्टम में बाहरी सीएमओएस सर्किट की सहायता के बिना किया गया था। पावलोव के कुत्ते के व्यवहार का अनुकरण करने के लिए एक प्रोटोटाइप किट विकसित की गई है जो न्यूरोमॉर्फिक आर्टिफिशियल इंटेलिजेंस के प्रति इस उपकरण की क्षमता को दिखाती है। जेएनसीएएसआर टीम ने जैविक तंत्रिका पदार्थ जैसी एक नैनोमटेरियल का आयोजन करके उन्नत न्यूरोमॉर्फिक आर्टिफिशियल इंटेलिजेंस को पूरा करने में आगे कदम बढ़ाया है।

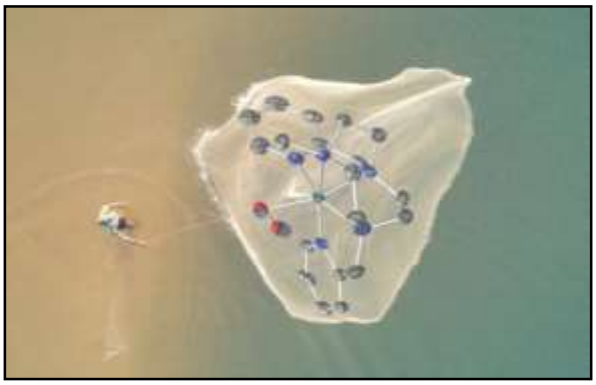
विज्ञान और प्रौद्योगिकी विभाग के सचिव प्रोफेसर आशुतोष शर्मा ने कहा कि प्रकृति के पास विकास के माध्यम से नए रूपों और कार्यों को करने के लिए असाधारण समय और विविधता है। प्रकृति और जीव विज्ञान से नई प्रक्रियाओं, प्रौद्योगिकियों, सामग्रियों और उपकरणों को सीखना और अनुकरण करना भविष्य की महत्वपूर्ण प्रगति के लिए महत्वपूर्ण मार्ग है जो मानव निर्मित प्रौद्योगिकियों के साथ जीवन से भरी दुनिया को तेजी से एकीकृत करेंगे।

https://pib.gov.in/PressReleasePage.aspx?PRID=1723208

Tue, 01 June 2021

Isolating an elusive missing link

The water oxidation reaction (WOR) is one of the most important reactions on the planet since it is the source of nearly all the atmosphere's oxygen. Understanding its intricacies can hold the key to improve the efficiency of the reaction. Unfortunately, the reaction's mechanisms are complex and the intermediates highly unstable, thus making their isolation and characterisation extremely challenging. To overcome this, scientists are using molecular catalysts as models to understand the fundamental aspects of water oxidation—particularly the oxygen-oxygen bond-forming reaction.



Capturing the elusive intermediate. Credit: ICIQ

For the first time, scientists in ICIQ's Lloret-Fillol group, who are minutely studying WOR, have isolated and fully characterized an elusive intermediate generated after the oxygen-oxygen bond formation event—the reaction's rate-determining step. The work, an international effort led by ICIQ in collaboration with University of Groningen (The Netherlands) and Synchrotron SOLEIL (France), has been published in *Nature Chemistry*. "Our work has direct implications in our capacity to look at the oxygen-oxygen bond formation step and the afterwards reaction intermediates," explains Julio Lloret-Fillol, ICIQ group leader and ICREA professor, lead author of the paper.

By modifying the conditions in their catalytic system, the researchers have crystallized the Ru (IV) side-on peroxo generated after the rate determining step of the reaction, the oxygen-oxygen bond formation event. "The paper will help to better understand the mechanism of the oxygen-oxygen bond formation, since it shows direct evidence for a single-site mechanism to form the oxygen-oxygen bond, one of the mechanisms postulated for photosystem II," claims Carla Casadevall, former Ph.D. student of the Lloret group, now a Marie Skłodowska-Curie postdoctoral researcher at the Erwin Reisner group at the University of Cambridge and first author of the paper.

Despite extensive efforts to elucidate its mechanism, WOR is still not fully understood, prompting an ongoing debate with several proposals concerning the formation mechanism of the oxygen-oxygen bond. The researchers have used labeling studies to monitor the intermediates formed both before and after the rate-determining step of WOR. This way, they have been able to provide direct evidence of the formation of the oxygen-oxygen bond by water nucleophilic attack from the metal-oxo.

"This paper proves again that well-defined molecular complexes offer access to fundamental aspects of WOR, otherwise very challenging, which will be useful for further efficient catalyst design," concludes Casadevall.

More information: Casadevall, C et al. Isolation of a Ru(iv) side-on peroxo intermediate in the water oxidation reaction. *Nat. Chem* 2021, DOI: 10.1038/s41557-021-00702-5.

Journal information: Nature Chemistry

https://phys.org/news/2021-05-isolating-elusive-link.html

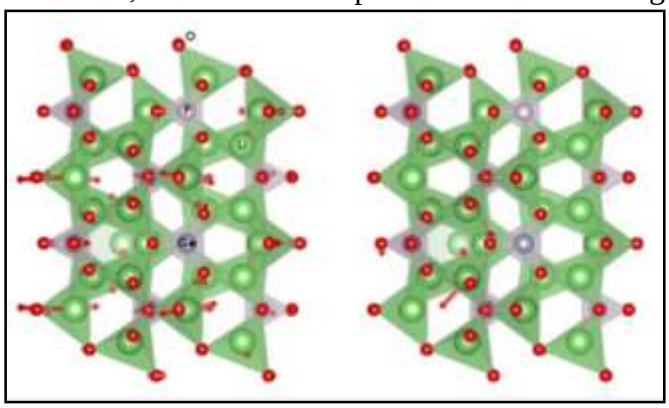
PHYS.ORG

Tue, 01 June 2021

Phonon catalysis could lead to a new field

By Mary Beth Gallagher

Batteries and fuel cells often rely on a process known as ion diffusion to function. In ion diffusion, ionized atoms move through solid materials, similar to the process of water being absorbed by rice when cooked. Just like cooking rice, ion diffusion is incredibly temperature-dependent and requires high temperatures to happen fast.



Using a model for lithium phosphate, researchers computed how much each phonon contributes to the ion diffusion process. Armed with this knowledge, researchers could use lasers to selectively excite or heat up specific phonons, rather than exposing the entire material to high temperatures. This could open lead to low-cost fuel cells and batteries, among many other applications. Credit: the researchers

This temperature dependence can be limiting, as the materials used in some systems like fuel cells need to withstand high temperatures sometimes in excess of 1,000 degrees Celsius. In a new study, a team of researchers at MIT and the University of Muenster in Germany showed a new effect, where ion diffusion is enhanced while the material remains cold, by only exciting a select number of vibrations known as phonons. This new approach—which the team refers to as "phonon catalysis"—could lead to an entirely new field of research. Their work was published in *Cell Reports Physical Science*.

In the study, the research team used a computational model to determine which vibrations actually caused ions to move during ion diffusion. Rather than increasing the temperature of the entire material, they increased the temperature of just those specific vibrations in a process they refer to as targeted phonon excitation.

"We only heated up the vibrations that matter, and in doing so we were able to show that you could keep the material cold, but have it behave just like it's very hot," says Asegun Henry, professor of mechanical engineering and co-author of the study.

This ability to keep materials cool during ion diffusion could have a wide range of applications. In the example of fuel cells, if the entire cell doesn't need to be exposed to extremely high temperatures engineers could use cheaper materials to build them. This would lower the cost of fuel cells and would help them last longer—solving the issue of the short lifetime of many fuel cells.

The process could also have implications for lithium-ion batteries.

"Discovering new ion conductors is critical to advance lithium batteries, and opportunities include enabling the use of lithium metal, which can potentially double the energy of lithium-ion batteries. Unfortunately, the fundamental understanding of ion conduction is lacking," adds Yang Shao-Horn, W.M. Keck Professor of Energy and co-author.

This new work builds upon her previous research, specifically the work of Sokseiha Muy Ph.D. on design principles for ion conductors, which shows lowering phonon energy in structures reduces the barrier for ion diffusion and potentially increases ion conductivity. Kiarash Gordiz, a postdoc working jointly with Henry's Atomistic Simulation and Energy Research Group and Shao-Horn's Electrochemical Energy Laboratory, wondered if they could combine Shao-Horn's research on ion conduction with Henry's research on heat transfer.

"Using Professor Shao-Horn's previous work on ion conductors as a starting point, we set out to determine exactly which phonon modes are contributing to ion diffusion," says Gordiz.

Henry, Gordiz, and their team used a model for lithium phosphate, which is often found in lithium-ion batteries. Using a computational method known as normal mode analysis, along with nudged elastic-band calculations and molecular dynamics simulations, the research group quantitatively computed how much each phonon contributes to the ion diffusion process in lithium phosphate.

Armed with this knowledge, researchers could use lasers to selectively excite or heat up specific phonons, rather than exposing the entire material to high temperatures. This method could open up a new world of possibilities.

The dawn of a new field

Henry believes this method could lead to the creation of a new research field—one he refers to as "phonon catalysis." While the new work focuses specifically on ion diffusion, Henry sees applications in chemical reactions, phase transformations, and other temperature-dependent phenomena.

"Our group is fascinated by the idea that you may be able to catalyze all kinds of things now that we have the technique to figure out which phonons matter," says Henry. "All of these reactions that usually require extreme temperatures could now happen at room temperature."

Henry and his team have begun exploring potential applications for phonon catalysis. Gordiz has been looking at using the method for lithium superionic conductors, which could be used in clean energy storage. The team is also considering applications such as a room-temperature superconductor and even the creation of diamonds, which require extremely high pressure and temperatures that could be triggered at much lower temperatures through phonon catalysis.

"This idea of selective excitation, focusing only on the parts that you need rather than everything, could be a very big kind of paradigm shift for how we operate things," says Henry. "We need to start thinking of temperature as a spectrum and not just a single number."

The researchers plan to show more examples of targeted phonon excitation working in different materials. Moving forward, they hope to demonstrate their computational model works experimentally in these materials.

More information: Kiarash Gordiz et al, Enhancement of ion diffusion by targeted phonon excitation, *Cell Reports Physical Science* (2021). DOI: 10.1016/j.xcrp.2021.100431

Journal information: Cell Reports Physical Science

https://phys.org/news/2021-05-phonon-catalysis-field.html

INDIA TV

Tue, 01 June 2021

Single dose of vaccine enough for Covid recovered? Here's what BHU researchers say

The BHU research has come amid reports that the government is mulling to tweak its vaccination strategy

A Covid-recovered patient should wait for three months to get vaccinated against the virus, says the present government guidelines. However, there is no clarity whether the patient should take both doses or a single jab would do? Now, researchers at the Banaras Hindu University (BHU) have found in a study that single dose of vaccine for those who have recovered from Covid-19 is enough.

Researchers at BHU have found in a study that a single dose of vaccine for those who have recovered from Covid-19 is enough.

"We studied effect of vaccine on Covid recovered and non-infected people. Antibodies in recovered people developed in first week," Gyaneshwer Chaubey, Professor at BHU's Zoology Department told news agency ANI.

Chaubey said that he has written to PM Modi about the research findings that could help resolve the present vaccine shortage in the country.

"While only 90% of non-infected people developed antibodies after 3-4 weeks. Recovered people developed antibodies after first dose. By giving single-dose to recovered people we can overcome vaccine shortage. We've also written a letter to PM in this regard," Chaubey said.

The BHU research has come amid reports that the government is mulling to tweak its vaccination strategy.

The government will review the impact of its recent decision to extend the Covishield doses' interval by collecting data from a Covid vaccine tracker platform that is yet to be launched, a report in The Indian Express said. The platform will be launched shortly through which the government will collect data related to people who are being inoculated as per the new schedule.

Sources said that the data may also help the government decide whether to approve a single-dose regimen for Covishield, the IE report said. Covishield is the local version of the Oxford-AstraZeneca COVID-19 vaccine. It is being manufactured by the Pune-based Serum Institute of India. It is a two-dose vaccine and the government recently increased the gap between two doses to 12-16 weeks.

https://www.indiatvnews.com/news/india/covid-vaccine-single-dose-enough-for-covid-recovered-bhu-research-latest-updates-708302