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समाचार पत्रों से चयित अंश Newspapers Clippings

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Tue, 19 May 2020

‘Automatic Sanitiser Dispenser’ By DRDO and Riot Labz brings perspective to automation future

DRDO collaborates with Riot Labz (Smart Oakter Homes) to build an automatic mist based sanitiser. Express Computer interviews Founder and CEO of Riot Labz to get more perspective on the product and the future of workplaces

By Radhika Udas

As we enter Lockdown 4.0, a lot of businesses will now be allowed to re-open and begin operations. The one thing that these businesses will have to ensure is a higher standard of safety and security at the workplace. Government organisations resumed operations a while back and have also adhered to essential safety protocols.

An automatic mist based sanitiser dispensing unit is one product that has been installed in the Ministry of Finance, Supreme Court, PSA Office, Ministry of Textile, Ministry of Housing and urban affairs, etc.

This sanitiser dispenser is called Oakmist and is developed by DRDO in collaboration with Riot Labz (Oakter Smart Homes). Express Computer's Radhika Udas gets in conversation with Shishir



Shishir Gupta, Founder and CEO, Riot Labz

Gupta, Founder and CEO at Riot Labz about the product, the technologies used and the future of automation.

Shishir Gupta explains that Oakmist is a touchless sanitizer dispenser. It automatically detects the presence of hands placed below it and dispenses of a mist spray of liquid hand rub sanitizer. This sanitizes the hands with minimum wastage & optimized flow to cover the complete hand in minimum time. Oakmist also comes with an advanced mobile app. The app connects oakmist to mobile's internet and gives ability for user to choose the mode of operation. There are two modes –

1. The spray happens whenever the hand is brought below Oakmist and a fixed amount of sanitizer as per WHO guideline is sprayed on the hands.
2. The spray happens whenever the hand is brought below Oakmist and stops when the hand is removed

He further adds that DRDO provided Riot Labz with an overall design concept, mist technology and also instructed that mobile app shall be provided for better user experience.

Commenting on the same, Technology advisor to DRDO's Chairman, Sanjeev Joshi says, "Oakmist is developed by CFEES, DRDO and manufactured by Riot Labz. It provides the hand



Sanjeev Joshi, Technology advisor to DRDO's Chairman

sanitization as per WHO guidelines. It removes the need of a dedicated person at the entrance of the building to manually provide the sanitizer to each and every person entering the building.”

What were the technologies used to create this sanitiser?

- A. Water mist aerator technology, which was developed by CFEES lab of DRDO for water conservation.
- B. Ultrasonic sensor technology which was developed by RIOT labz for another product
- C. IoT technology for mobile app development and connecting it to Oakmist.

The company claims to have witnessed good results so far with the device being installed in almost all government premises including PM’s Office. It is being used in government and private hospitals as well. Currently, the company is manufacturing more than 1000 products per day and scaling production as per instructions by DRDO.

Future of IoT devices and automation

Riot Labz specialises in internet-connected smart devices and they now see these products becoming more relevant and essential during the pandemic. “Voice control of room products are seeing strong traction in premium 5 star hotels. Many hotels are planning to implement in their hotels as soon as lockdown opens up so that they can offer touch-free control of all devices in their rooms. Our products like Oakremote and Tankbolt have seen 37% increase in daily usage since people are staying at home. We are sure similar trend is being seen by all internet connected devices,” highlights Shishir Gupta.

When asked about the future of automation now that most businesses are considering to automate tasks in order to comply with the social distancing norms, Shirshir says- “I think, automation will see growth in next 5 years which we have not seen in last 50 years. The factories will get automated on large scale. Devices like dishwasher and automatic floor cleaners will become a norm in every household even in India.”

He points out that devices like Oakmist which didn’t even existed 3 weeks ago will be seen in more than 10M offices & other commercial establishments worldwide within the next 6 months. And finally says, “AI-based automation will increasingly take smart decisions to work in background. Automation will be an integral part of the new normal.”

<https://www.expresscomputer.in/interviews/automatic-sanitiser-dispenser-by-drdo-and-roit-labz-brings-perspective-to-automation-future/56011/>

ज्ञान प्रसार एवम् विस्तार
के 50 वर्ष



Tue, 19 May 2020

CGI NCA-90 AWACS shows what India can achieve being Atamnirbhar

By Satyajeet Kumar

Unofficial Computer-Generated Imagery (CGI) of the proposed National Civil Aircraft (NCA-90) to be developed by National Aerospace Laboratories (NAL) to produce India's home-made aircraft for its regional aviation market in long-range Fixed AESA Airborne Warning & Control System (AWACS) will look like if NAL develops NCA-90 in next few years.

NAL had plans to develop a total of seven prototypes to prove the design and demonstrate compliance concerning airworthiness requirements and certification and had plans to rope in other public sector undertakings (PSUs) like Hindustan Aeronautics Limited (HAL), Defence Research and Development Organisation (DRDO), Bharat Electronics Limited (BEL) and Aeronautical Development Agency (ADA).



The private sector which has shown interest in the program was HCL, Quest, Infosys, Mahindra, L&T and Tata Group. NAL wanted to use engines from global manufacturers like Pratt & Whitney or General Electric developed commercial engines and avionics suite developed from firms like Rockwell Collins and Diehl Aerospace.

NAL had also proposed to develop a military variant that could be used as a transport aircraft and was able to carry 88 to 100 paratroops/passengers or up to 20 tonnes of cargo with a design range suitably configured.

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<https://idrw.org/cgi-nca-90-awacs-shows-what-india-can-achieve-being-atamnirbhar/#more-227611>

Rs 47,000 Cr LCA fighter aircraft projects to be finalised in next few months: IAF Chief

In a big boost for defence under the Make in India initiative, Air Force Chief RKS Bhadauria on Monday said that the second squadron of Light Combat Aircraft (LCAs) worth over Rs 8,000 crore would be operationalised by the end of May.

Speaking to ANI, the Air Force Chief said the force is also expecting to finalise a contract worth around Rs 39,000 crore for 83 LCA Mark 1A Aircraft in the next quarter. "The first squadron is already operationalised. We were to operationalise the second squadron in April, we have resurrected the squadron. But due to COVID-19, it got delayed.

Some work at HAL had stopped which has restarted. Hopefully, before the end of this month, we will inaugurate the second squadron of LCA. It's worth just in terms of aircraft and ground assets, will be upwards of Rs 8,000 crore," Bhadauria said here.

Speaking about the future programs on LCA, he added, "We are pushing hard for 83 LCA Mark 1A, that's our immediate focus area. Within the next quarter, we should be able to sign it. Most of the negotiations have been completed and I think the Ministry is going to move it in a month or so." He said that this project would range around Rs 39,000 crore.

Besides this, the Air Force Chief stated that they are also going to make good progress on the weapons side with Astra MK-1.

"We are pushing the Astra weapons, the Beyond Visual Range weapons order would be in place within about six months or so. Also, long-range precision-guided ammunition would be in place," he said.

Supporting the increase in the limit of FDI by the Centre from 49 to 74 per cent, the IAF chief said, "This will have a large impact as far as Make in India is concerned. The 74 per cent FDI limit should be seen with support measures for MSMEs, the broad directions towards public sector enterprises which have come out in terms of sectoral reforms, and the 74 per cent FDI."

"This will have a huge impact on Make in India for indigenous production. The industries should work towards utilising these reforms which have been put in place," he further said.

<https://www.defencenews.in/article/Rs-47,000-Cr-LCA-Fighter-Aircraft-Projects-To-Be-Finalised-In-Next-Few-Months-IAF-Chief-830708>



'IAF to acquire 450 fighter aircraft in future,' reveals Indian Air Force Chief Bhadauria

Air Force Chief RKS Bhadauria revealed that the Indian Air Force was planning to procure 450 fighter aircraft for deployment on the northern & western frontiers

By Ananya Varma

Air Force Chief RKS Bhadauria revealed that the Indian Air Force was planning to procure 450 fighter aircraft for deployment on the northern and western frontiers of the country over the period of a few years. While speaking to news agency ANI, the Air Force Chief spoke about the list of aircraft that the Air Force was planning to induct which included 36 Rafales, 114 Multirole Fighter Aircraft, 100 Advanced Medium Combat Aircraft (AMCA) and over 200 variants of the Light Combat Aircraft. He added that the induction of these fighters would take place over a period of the next 35 years. This comes a few months after the Indian Air Force faced a shortage of around 10 squadrons of Combat Aircraft in view of phasing out of the MiG-21 and MiG-27 fighters planes.

"In the next 15 years, 83 LCAs are our primary focus, after that LCA Mark 2 will come in we are looking at close to 100 of those, that makes it near 200 of LCA class," Bhadauria told news agency ANI in an interview. "AMCA, we are looking at six squadrons, so that puts it close to 100 (aircraft). So, in the indigenous domain areas which are already frozen in terms of our requirement, in terms of our understanding with DRDO in the fighter (segment)," he added.



Bhadauria revealed that currently, it was the best time from the point of time for 'indigenous production' of these aircraft since industries were responding and coming up with solutions to the challenge of delivering them. "In the trainer aircraft segment, we are looking at 70 HTT-40 as a support aircraft to the Pilatus fleet. So, we are looking at 370 odd indigenous aircraft," said the IAF Chief.

On plans to acquire 114 multirole fighter aircraft, he said, "this project is in the middle-weight and is in the Rafale class, in this issue, we will deal with it in the Make in India region, with an increase in FDI, with support to the private sector. I think in future this will bring in technology which is required to support the aviation sector. I think it is important to have another generation of aircraft in terms of capability, technology as we go along."

<https://www.republicworld.com/india-news/general-news/iaf-to-acquire-450-fighter-aircraft-in-future-reveals-air-force.html>

Philippines explores options to buy BrahMos missile from India

By Elizabeth Roche

- *India is also exploring the possibility of selling the BrahMos to Indonesia*
- *The Philippines and India have had price negotiation talks for the BrahMos cruise missile jointly developed by India and Russia*

India and the Philippines are in talks for the purchase of a number of defence platforms from India including the Brahmos missile, India's ambassador to the Philippines Jaideep Majumdar has said.

"There are discussions going on a range of weapons systems between India and the Philippines. Once travel becomes possible, the joint committee that looks at defence logistics will meet discuss these things," Majumdar said on Monday.

The Philippines and India have had price negotiation talks for the BrahMos cruise missile jointly developed by India and Russia, with the aim of concluding a deal in 2020, two people familiar with the matter said separately.

The Philippines is one among several countries in Southeast Asia, including Thailand, Indonesia and Vietnam that has shown an interest in purchasing the land and sea-based versions of the supersonic cruise missile.

The cost of the system was a key factor in Manila's decision to equip the Philippines Army's first Land Based Missile System Battery, which was raised and activated in October, one of the people cited above said.

Though India has offered a \$100 million line of credit to the Philippines for defence purchases, Manila is exploring the option of acquiring the BrahMos system with its own funds to be allocated in the next budget.

In recent years, the Philippines has concluded several deals with India for personal protective items or bulletproof gear and armour plating for military vehicles. An Indian firm has also bid for a recent Philippines tender for bulletproof gear.

During Prime Minister Narendra Modi's visit to the Philippines in 2017, India and the Philippines had signed an MoU on defence industry and logistics cooperation to provide a framework for strengthening cooperation and coordination in logistics support and services, and in the development, production and procurement of defence hardware.

India is also exploring the possibility of selling the BrahMos to Indonesia, and a team from the Indo-Russian joint venture that makes the system visited a state-run shipyard to assess the fitting of the missile on Indonesian warships.

India has also held talks with Vietnam for the sale of the BrahMos, which was developed by the Indo-Russian joint venture set up in 1998. The Indian Navy inducted the missile on its frontline warships in 2005 and the army began inducting the BrahMos from 2007 after a series of tests.

<https://www.livemint.com/news/india/philippines-explores-options-to-buy-brahmos-missile-from-india-11589823975582.html>



The Philippines and India have had price negotiation talks for the BrahMos cruise missile jointly developed by India and Russia. (PTI)

Tue, 19 May 2020

Indian Navy's "breathable" PPE kit "NavRakshak"

Mumbai: The Indian Navy's indigenously-made PPE kit, "NavRakshak", made for enhancing comforts of the health workers under Indian conditions, is helping fight the war against Covid-19 in a better and effective manner, officials said here on Monday.

It was made by a doctor who can understand the agony of his fraternity wearing a multi-layered coverall PPE while treating patients for upto 12 hours in hot and humid conditions.

The "NavRakshak" with an innovative "breathable" fabric material, has brought new hopes to the medical world and healthcare professionals from whose perspective it has been designed.

"When it comes to PPE, everyone is concerned only about the water, blood, body fluid resistant levels of the material used in making PPE but the comfort and breathability of such PPE is something few have paid attention to.

"This PPE is made by a doctor, keeping in mind a doctor's pain," said Surgeon Lieutenant Commander Arnab Ghosh from Naval Medical Specialist of Innovation Cell, Institute of Naval Medicine in Mumbai.

Navrakshak - which translates to a "novel protector", has two distinctive factors; optimal protectiveness and optimal breathability.

Ghosh said: "As a doctor I can say, most of the PPE available in the Indian market are ignoring the "breathability" factor. Because of this, the health care workers get easily exhausted due to the prolonged use of substandard, low quality PPE."

Breathability is the ability of the fabric to permit water vapour to pass through and to prevent the entry of water. The comfort properties of a fabric depend on its ability to transmit water and vapor from the body to prevent accumulation of liquid on the skin.

In this way, thermal energy generated by the body will be transmitted, and vapour moisture will be diffused, resulting in a comfortable condition.

With a view to cater to the unprecedented demand due to Coronavirus pandemic, many NGOs and organisations have already been actively involved in procuring and supplying PPE to the aid of hospitals.

NavRakshak uses a non-woven advanced quality fabric of specific GSM with a certain stitching technique. The unique character of the fabric used is its strong uniform structure which can act as an excellent barrier for liquids, particles, blood and body fluids.

Intellectual Property Facilitation Cell (IPFC) of the Ministry of Defence has already filed a patent for the innovative cost-effective PPE developed by Indian Navy, to enable rapid mass production of NavRakshak PPE.

"It took me seven days to make this PPE. I had to do extensive research about a wide variety of fabrics, had to study different medical garments like headgears, gloves etc. Due to the lockdown it was even difficult for us to obtain the raw materials. After much research I arrived at this new technology," said Ghosh.

A pilot batch of PPE has already been produced at Naval Dockyard Mumbai. Innovation Cell, Institute of Naval Medicine, Mumbai and the Naval Dockyard Mumbai have collaborated to design and produce the PPE.

The new technology has already been tested by INMAS (Institute of Nuclear Medicine and Allied Sciences) Delhi, a DRDO organization tasked with the testing and certification of PPE.

The PPE passed with 6/6 Synthetic blood penetration resistance test pressure (Government of India mandates minimum 3/6 and above level as per ISO 16603 standard), certified for mass production and use in clinical COVID situations.

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

<https://www.outlookindia.com/newscroll/indian-navys-breathable-ppe-kit-navrakshak/1838128>

THE TIMES OF INDIA

Tue, 19 May 2020

Indian Navy surgeon makes PPE kit that is comfortable for doctors to wear in hot climate conditions

New Delhi: Medical professionals are required to wear PPE kits to treat COVID-19 patients but one of their most common complaints is that wearing PPE kits for up to 12 hours in hot and humid weather conditions is exhausting and highly uncomfortable. Keeping this in mind, Indian Navy's surgeon Lieutenant Commander Arnab Ghosh from Institute of Naval Medicine in Mumbai has developed a PPE kit addressing comfort and 'breathability' factor.

"As a doctor I can say, most of the PPE available in the Indian market are ignoring the 'breathability' factor. Because of this, the health care workers get easily exhausted due to the prolonged use of substandard, low quality PPE," said Lieutenant Commander Ghosh.

Dubbed as 'NavRakshak PPE', it comes with non-woven advanced quality fabric of specific GSM with a certain stitching technique. "The unique character of the fabric used is its strong uniform structure which can act as an excellent barrier for liquids, particles, blood and body fluids," as per a statement by the Ministry of Defence.



"It took me seven days to make this PPE. I had to do extensive research about a wide variety of fabrics, had to study different medical garments like headgears, gloves etc. Due to the lockdown it was even difficult for us to obtain the raw materials. After much research I arrived at this new technology", said Lieutenant Commander Ghosh.

A pilot batch of PPE has already been produced at Naval Dockyard Mumbai. Innovation Cell, Institute of Naval Medicine, Mumbai and the Naval Dockyard Mumbai have collaborated to design and produce the PPE. The new technology has already been tested by Institute of Nuclear Medicine and Allied Sciences (INMAS) Delhi, a DRDO organisation. The PPE passed with 6/6 Synthetic blood penetration resistance test pressure. The government of India mandates a minimum 3/6 and above level as per ISO 16603 standard.

"It enhances the user's comfort even under prolonged use in hot and humid conditions and is extremely economical. After making it, I tested the PPE on me by wearing it for 2-3 hours, switching off the fans, to test how long a doctor/user can sustain this comfortably", he said.

<https://timesofindia.indiatimes.com/gadgets-news/indian-navy-surgeon-makes-ppe-kit-that-is-comfortable-for-doctors-to-wear-in-indian-climate-conditions/articleshow/75809926.cms>

THE WIRE

Tue, 19 May 2020

Explainer: Why is the Indian Army's 61 Cavalry regiment being downsized?

The army chief is reportedly considering a proposal to merge three in-depth recce squadrons with its tanks and personnel with the 61 Cavalry headquarters

By Sangeeta Barooah Pisharoti

New Delhi: Every Republic Day, the Indian Army's 61 Cavalry Regiment fronts the march on New Delhi's Vijay Chowk to Rajpath.

A clutch of men in their military finery, mounted on handsome horses, trotting by the presidential dias was a reminder that the Indian Army is the only military power in the world to possess such a non-mechanised, operational regiment.



The 61st Cavalry Regiment of the Indian Army. Photo: Angad Singh/Flickr, CC BY 2.0

Every Army Day, it is also this regiment that leads the parade.

Now, caught in the midst of all round cost-cutting, the buzz is, the government is going to downsize the regiment and turn it into a mechanised one – much like many other cavalry units that were made full-fledged armoured regiments post-Independence.

As per news reports this week, Army Chief General M.M. Naravane “is studying a serious proposal to merge three in-depth recce squadrons with its tanks and personnel with the 61 Cavalry headquarters in Jaipur and raise a new armoured regiment.”

“It is this regiment that will carry the illustrious 61 Cavalry name,” said a report in *News18*, quoting official sources.

With steps possibly being taken to wind up India's only horse-mounted cavalry regiment, it is perhaps time to rewind and acknowledge what led to the formation of the regiment and what have been its achievements, including its stellar role in promoting Polo and other equestrian games.

Has the regiment lost its utility altogether to qualify for a burial?

What was the genesis of 61 Cavalry?

Like most regiments, the origin of the 61st Cavalry also goes back to the British period. The Viceroy's Body Guards and other horse-mounted units drawn from various Indian princely states were part of the Imperial Service State Forces.

Following Independence, the Viceroy's Body Guards became the President's Body Guard (PBG) unit of the Indian Army. Post regularisation of the Indian Army in 1951, the other horsed cavalry units were reconstituted and named Gwalior Lancers, Mysore Lancers, Second Patiala Lancers, Jodhpur or Kachhawa Horse and B Squadron.

In October 1953, all these units were combined and brought under a new regiment named 61st Cavalry. It was formalised in January 1954 with Lt. Col. Phulel Singh of Jammu and Kashmir State Forces as its first commandant.

To keep the traditions alive, the regiment recruits only Marathas, Rajputs and Kaimkhani Muslims in equal numbers. This was as per the instructions of the first Prime Minister Jawaharlal Nehru.

What are the major achievements of the regiment?

Every September 23, the Indian Army celebrates Haifa Day, signifying the crucial role the Indian Cavalry played under the Royal British Army, in freeing the coastal city of Haifa (now in Israel) from the enemy forces during its Sinai and Palestine campaign in the First World War. The cavalry regiments of the princely states of Jodhpur, Hyderabad, Mysore among others mostly populated the Royal British Army's 5th Cavalry Division that led the campaign in the Battle of Haifa in 1918. The victory hugely helped the British forces to use the Haifa port to carry supplies closer to the battlefield.

The three bronze statues of the Indian Cavalry soldiers spotted on New Delhi's Teen Murti roundabout is a reminder of that victory. The memorial was sculpted by Leonard Jennings in British India. Placed right outside the Teen Murti Bhavan where the first Prime Minister of an independent India resided, the statute had gained prime of place.

In an article in the *Asian Age* in 2017, Lt. Col Anil Bhatt, VSM (Retd) described, "The three statues represent Sowars (as cavalry and armoured corps soldiers are known) from the three Indian state forces — Hyderabad, Mysore and Jodhpur — together with detachments from Bhavnagar, Kashmir and Kathiawar, which were part of the 15th Imperial Service Cavalry Brigade."

Speaking to *The Wire*, Bhat recalled, "In January 2018, when Israeli Prime Minister Benjamin Netanyahu visited New Delhi, Prime Minister Narendra Modi broke protocol and went straight to that memorial on Teen Murti Marg from the airport with him. There, the duo paid homage to the brave Indian soldiers that fought the Battle of Haifa and thereafter named it Teen Murti Haifa Chowk."

In September that year, the Haifa administration celebrated the centenary year of its liberation from the Ottoman rule and honoured the Indian soldiers who laid down their lives for it. According to news reports, "Captain Aman Singh Bahadur and Dafadar Jor Singh were awarded the Indian Order of Merit (IOM) and Captain Anop Singh and 2nd Lt Sagat Singh were awarded the Military Cross (MC) as recognition for their bravery in this battle while Major Dalpat Singh was awarded a military cross for his bravery."

At least 900 Indian soldiers who fell in that battle have been buried in cemeteries in Haifa, Jerusalem and Ramle. In 2017, during his visit to Israel, Modi, as the first Indian prime minister to visit that country, had paid his homage at the Haifa cemetery.

In post-independence India, the 61st Cavalry played an important role during the India-Pakistan War of 1971. The regiment took to patrolling the areas which were difficult to cover with vehicles or on foot. It was also used in Operation Vijay in 1961 to annex Goa.

In 2001, it played a role during the Army's Operation Parakram, launched after the Parliament attack, as a preparation for war.

The Indian Army's operational manual counts the regiment as part of its war establishment to be deployed for roles like patrolling forward areas, scouting and guarding vital areas.

What role does the regiment play in promoting Polo and other equestrian sports in India?

The 61st Cavalry has played a crucial role in promoting the game of Polo which bears its origin in India (Manipur) besides competing in other equestrian games. The regiment has produced some of the finest Indian polo players. As many as 11 Arjuna awards, the country's highest award for sports, have gone to the 61st Cavalry for Polo and other equestrian games.

Thanks to the polo-playing traditions of this regiment, India has pocketed gold in World polo championships in 2011 and 2017. India's highest handicapped polo player is Col. Ravi Rathore, presently the Commanding Officer (CO) of the regiment, an Arjuna awardee.

"Polo is an elitist sport with infrastructure almost out of bounds for a civilian. The Army and the royalties have kept this spectacular and skilful sport going. The 61st Cavalry has played an iconic

role in sustaining Polo and other equestrian games,” said senior sports journalist Vijay Lokapally. “The National Sports Code has not been met with a favourable response from the Army and this move (of reconstituting the regiment and thereby affecting the game) will likely face stronger resistance (from within the Army) as it would be detrimental to Polo and equestrian games,” he said.

Col. Rajesh Pattu, a veteran polo player who has represented India in several international tournaments and was the Commanding Officer (CO) of the 61st Cavalry prior to present Col. Rathore, was scathing in his response to the recent move, “Disbanding the 61st Cavalry for reasons of cost cutting is deleting an integral link of the Indian Army’s heritage and tradition which can never be replaced. The 61st Cavalry has produced more medals for India than all other units (of Army) combined while using minimal resources.” He told this correspondent, “The Indian Army would like to keep control of the Equestrian Federation of India while cutting off the arm that gives them the most results. This is nothing but a ploy of a few jealous people who seem to be in favour with the powers that be.”

What is the Army’s plan for the regiment post-COVID-19?

As per news reports, the proposal to change the 61 Cavalry to a mechanised regiment may have been fast-tracked due to cost-cutting post-COVID-19 crisis but the original idea is said to be based on the recommendations of the Committee of Experts (CoE) headed by Lt Gen. (retd.) D.B. Shekatkar.

The committee had submitted its report in December 2016 suggesting measures to increase the “combat capability and re-balance defence expenditure” of the armed forces. Though the report is not in the public domain as it covers operational aspects of the defence forces, according to a note by the Press Information Bureau in February 2019, the committee had suggested 99 recommendations including “better utilisation of supply and transportation echelons and animal transport units” and “closure of military farms”.

The Army would reportedly go about mechanising the 61 Cavalry by bringing under it three independent armoured squadrons located in different parts of the country. “This will entail virtually no extra expenditure as the squadrons are already equipped with tanks,” a senior officer told the *Indian Express*. The transition will take around five months “or even more in view of the COVID-19 restrictions in place”.

Reports said with additional T-90s and Arjun tanks being readied, the Army is keen on raising armoured regiments. “The CO (commanding officer) of the new armoured regiment (61st Cavalry) at Jaipur will be given “command and control’ over three independent T-72 tank squadrons, as per the plan”, the *Times of India* said.

As per news reports, it would only have 232 horses which would be transported to Delhi from Jaipur, the headquarters of 61 Cavalry, to be occupied mainly for ceremonial purposes. Though it is not clear yet, the participation of the horses in the Republic Day parade as a ceremonial exercise may continue. But for all practical purposes, the President’s Body Guards (PBG), which performs the ceremonial roles for the Rashtrapati, would remain the only horse-mounted component of the Indian Army. It would be akin to the Household Cavalry Mounted Regiment of the British Army which too performs mainly ceremonial duties, including escorting the Queen for the state opening of Parliament.

Does it make sense to disband the cavalry for an armoured version?

The oldest surviving veteran of the regiment, Col. H.S. (Billy) Sodhi, has termed the government’s move silly. “Horses are lucky for any army. How much money do you think they can save by reducing 32 or 50 horses from our stables? Yes, the army needs to modernise, but some traditions need not die. A link between the past and present needs to be kept alive,” Col. Sodhi was quoted in the *Times of India*.

Lt. Col Bhatt who is also an army historian besides being an independent strategic affairs commentator after his retirement, said, “The retention of 61st Cavalry as a horsed cavalry regiment was also significant because it has helped survive the historic tradition of cavalries of many

erstwhile Indian dynasties and kingdoms. Besides, the regiment also trains army officials in horse riding, which is an important skill. I am sad to hear about plans to make it a mechanised regiment, like the rest of them, especially when it still has its utility. Besides being the link between our past and the present, it also helps Army win many medals in equestrian games which helps to promote those practices. These points must be looked into before reconstituting the regiment.”

A retired officer from the regiment added, “The Indian Army has 3,000 horses covering all its units. It is strange that it is talking about disbanding the 61st Cavalry citing cost cutting measures, which has only 280 of those horses.”

<https://thewire.in/security/explainer-indian-army-61-cavalry>



Tue, 19 May 2020

Step towards Atmanirbharta

Warship IN LCU L-57 Indigenously built at GRSE, Commissioned

Kolkata: The Seventh of the Eight Landing Craft Utility (LCU) IN LCU L 57, built at Garden Reach Shipbuilders and Engineers Limited (GRSE), Kolkata, a Mini Ratna Category 1 & leading shipyard of the country was commissioned today at Port Blair by Lt. General PS Rajeshwar PVSM, AVSM, VSM, ADC CINCAN. The ship is the 103rd warship delivered by GRSE.

GRSE's association with the Indian Navy is long and strong as over the last six decades the shipyard has been building warships and other vessels for the country's Navy and Coast Guard. Over last 60 years, GRSE has built and delivered over 780 platforms which include 104 warships to Indian Navy, Indian Coast Guard & Government of Mauritius which is highest number of warships built & delivered by any shipyard in the country. Incidentally, the 100th warship delivered by GRSE was also a Landing Craft Utility, IN L 56. The first ship of the Mark IV LCU Vessels IN LCU L-51 was commissioned into Indian Navy in March 2017.

From building 05 ton boats to 24600-ton Fleet Tanker, GRSE has done it all and has proved its mettle as a pioneer warship builder of the nation. GRSE built ships are varied in their range and scope. From Anti Submarine Warfare Shallow Water Crafts, Frigates, Missile Corvettes, Anti-Submarine Warfare Corvettes, Fleet Tankers, Landing Ship Tank, Landing Craft Utility to Survey Vessels, Offshore Patrol Vessels and Fast Attack Crafts – the repertoire is rich and varied. GRSE has embraced infrastructure modernization over past decades towards creating an integrated shipbuilding facility enabling concurrent construction of 20 ships. GRSE has once again proves its ability to provide end-to-end solutions to their customers ranging from product conceptualization, design, system integration and project management, thereby enhancing the capability to meet customer demands. Key areas of strength of the shipyard include a strong, multi-disciplinary design expertise, production acumen and focused project planning & execution approach. These are traits that have helped the shipyard create strong differentiators in its path of growth.

The entire design of these LCU Mark IV ships has been developed in-house by GRSE as per requirements specified by Indian Navy. The LCU Mark IV Class of ships are fitted with close to 90% indigenous content in line with the Govt. of India's 'Make in India' initiative towards achieving self-reliance and indigenization. LCU Mk-IV is an amphibious ship with its primary role being transportation and deployment of Main Battle Tanks, Armored Vehicles, troops and equipment from ship to shore. The ships are equipped with Bow Ramps to enable loading/unloading of combat equipment and vehicles upon beaching. These ships based at the Andaman and Nicobar Command, can be deployed for multirole activities like beaching operations, search and rescue, disaster relief operations, supply and replenishment and evacuation from distant islands. The LCU is 63 m in length and 11 m wide and has a displacement of 830 T

with a low draught of 1.7 m. It can achieve speed of 15 knots. The LCU is designed to accommodate 216 personnel and is equipped with two Indigenous CRN 91 Guns to provide artillery fire support during landing operations. The ship is fitted with state-of-the-art equipment and advanced systems like Integrated Bridge System (IBS) and Integrated Platform Management System (IPMS).

Another class of Landing Ships indigenously designed and built by GRSE are the Landing Ship Tanks (LST). Amphibious warfare vessels, INS Magar and INS Shardul are active part of Operation “Samudra Setu” in which several aircraft of the Indian Air Force and vessels of the Indian Navy have been deployed to bring back stranded Indians amidst the COVID-19 pandemic. GRSE is also supporting the nation’s fight against COVID-19 through contributions to PMCARES fund and distribution of ‘Masks’, ‘Sanitisers’, ‘Soap’ and food grains to the needy amongst the community around the Company.

Currently GRSE has a strong order book of over Rs.27000 Crore equipping the shipyard with a deep pool of revenue-generating projects. 18 ships which include 08 ASWSWC, 03 P17A, 04 Nos. Survey Vessels (Large), 01 LCUs, 02 FPVs are in various stages of construction and are expected to be delivered to the Indian Navy and the Indian Coast Guard accordingly. GRSE continues to sail on a growth trajectory with increased thrust on export of warships, incorporation of latest technologies (Artificial Intelligence, Machine Learning, Data Analytics) in various areas of operations to improve internal efficiencies & profit margins.

<http://www.newspatrolling.com/step-towards-atmanirbharta/>

ThePrint

Tue, 19 May 2020

Not bullets but explosives cause maximum injuries to Army personnel: Study

The study for the period 2014-19 has found that 80% of limb injuries were due to explosions caused by artillery shells and anti-personnel landmines

By Snehesh Alex Philip

New Delhi: It is not bullets but explosives or fragmentation devices that contribute to the maximum number of injuries among soldiers involved in counter-insurgency operations, especially in Jammu and Kashmir, a study conducted by Army doctors has revealed.

Published in the latest issue of the *Journal of Marine Medicine*, the study on limb injuries shows that 80 per cent of such injuries, between 2014 and 2019, were due to explosions caused by artillery shells and anti-personnel landmines (APLM).

“From January 2014 to December 2019, we received 272 casualties, of which 166 (61.02 per cent) were with limb injuries”, said the study, *Limb Injuries in Combat Trauma*, compiled by Colonel Sanjay Maurya, Lt Colonel Vipin V. Nair, Colonel Onkar Singh and Lt Colonel S.K. Singh.

The analysis, however, is based only on 166 cases of injuries and not the fatal casualties. It is also from one tertiary care centre, which is likely to be the Command Hospital, Udhampur, in Jammu and Kashmir as the study has focussed on the western sector.

“Seventy-three (43.9 per cent) casualties had isolated upper limb injuries, 71 (42.77 per cent) had isolated lower limb injuries, and 22 (13.2 per cent) casualties had concomitant injuries,” the study said. “A total of 112 (67.4 per cent) injuries were caused by explosives or fragmentation devices, whereas 54 (32.5 per cent) were caused by bullets.” It added that in most wars, fragmentation devices account for the majority of injuries. Fragmentation devices include IEDs, rocket-propelled grenades, mortar fire, APLM, and artillery shells.

Artillery shells, landmines the worst offenders

The study also found that of the 112 injured, most had been hit by artillery shells or affected by landmines (APLMs).

“When we specified the explosive device, it was found that 80 per cent of these were caused by artillery shells and APLM,” the study said. “This high incidence is due to continuing hostilities across the Western border, where artillery shelling by the hostile nation is a constant feature.

“The movement of troops in the region of APLM during CI Ops also contributed to such high figures of landmine injuries. These findings can have implications for its administrative and logistic support for the military commanders,” the study added.

The study also underlined the importance of wearing body armour — bullet-proof jackets and helmets — which it said had improved the survivability of soldiers and the reason why 60 to 70 per cent of all injuries were recorded to hands and limbs.

The study itself is unique because it has for the first time evaluated limb injuries in a combat zone. It also demonstrates the grade of injuries, hospitalisation time, number of surgeries, and their correlation in the ongoing military operations by the Indian Armed Forces.

This study will be helpful for the Army commanders because it can form a basis of logistic and administrative support in providing quality combat trauma care and also focus on preventive aspects.

<https://theprint.in/defence/not-bullets-but-explosives-cause-maximum-injuries-to-army-personnel-study/424124/>

Forbes

Tue, 19 May 2020

Maybe India will get its Super F-16, after all

By David Axe

Hang on—maybe the Indian Air Force *will* buy the F-21, a sort of “super F-16” from U.S. plane-maker Lockheed LMT Martin.

India’s chief of the defense staff Bipin Rawat said in a May 15 interview that the air force would cancel its tender for 144 foreign-made jet fighters and instead order 83 additional Indian-made Tejas Light Combat Aircraft on top of the 40 LCAs the service already has paid for.



“The Indian Air Force is switching that to the LCA,” Rawat said.

Rawat’s announcement seemed to be the death-knell for the F-21, a greatly-upgraded F-16 variant that Lockheed is developing specifically for the Indian tender.

But hold on! Air Chief Marshal R.K.S. Bhadauria, the head of the Indian Air Force, on May 18 contradicted Rawat. Bhadauria clarified that the Indian Air Force wants *both* the 114 foreign planes *and* the additional LCAs.

The lightweight Tejas with its single engine and four-ton payload is in a different class than are the medium-weight fighters—some of them with two engines—that the air force hopes to acquire under the 144-plane tender.

For the record, Bhadauria explained that the air force’s current fighter-acquisition programs include the foreign tender, a long-term requirement for 100 “advanced medium combat aircraft” plus separate purchases of 36 Rafales from France as well as up to 200 LCAs in several variants.

The 114-plane program could cost \$15 billion. The new, 83-plane LCA purchase, which comes on top of a previous order for 40 of the type, could set back New Delhi around \$6 billion.

The F-21, Boeing BA BA's F/A-18E/F, the Rafale, the European Typhoon, the Swedish Gripen E and the Russian MiG-35 and Su-35 all are contenders for the 114-fighter program. Indian companies would assemble the new jets on license.

The F-21 arguably is the most sophisticated of the candidates. Compared to older F-16s, the design boasts new cockpit displays, conformal fuel tanks, a large airframe spine that can accommodate communication systems or radar-jammers, fittings for towed radar decoys, a new infrared sensor and a refueling probe for use with India's Russian-made aerial tankers.

The super-F-16 also includes technology from Lockheed's F-22 and F-35 stealth fighters. "The F-21 has common components and learning from Lockheed Martin's fifth-generation F-22 and F-35 and will share a common supply chain on a variety of components," Lockheed stated on its website on the morning of Feb. 20, 2019.

A few hours later, that claim disappeared from the site. In any event, the F-21 would have been the most advanced version yet of the single-engine F-16, which flew for the first time in 1974.

The Indian air force in 2020 maintains just 28 fighter squadrons against a requirement for 42 squadrons. The current force includes European-designed Jaguars, French Mirage 2000s and Rafales, Russian MiG-29s and Su-30s and the Tejas.

The service hopes to stand up three new units in 2020 as additional Rafales, Su-30s and LCAs arrive.

<https://www.forbes.com/sites/davidaxe/2020/05/18/maybe-india-will-get-its-super-f-16-after-all/#20f566aa2f55>



Celebrating
50 years

Tue, 19 May 2020

Coronavirus संकट के बीच एयर चीफ मार्शल ने बताया किन स्ट्रेटजी पर है फोकस

इंडियन एयरफोर्स चीफ (Indian Air Force Chief), एयर चीफ मार्शल आरकेएस भदौरिया (Rakesh Kumar Singh Bhadauria) ने कोरोनावायरस संकट के दौरान एयरफोर्स कैसे काम कर रही है और बजट में कटौती की बात सामने आने के बाद उनके सामने क्या समस्या रहेंगी, इन मुद्दों पर खुलकर बात की।

देश में कोरोनावायरस मामलों की संख्या बढ़ती ही जा रही है। कोरोनावायरस संकट (Coronavirus) का असर केवल आम लोगों पर ही नहीं पड़ा है, बल्कि इस संकट से भारतीय सेना भी जूझ रही है। इस बीच इंडियन एयरफोर्स चीफ (Indian Air Force Chief), एयर चीफ मार्शल आरकेएस भदौरिया (Rakesh Kumar Singh Bhadauria) ने कोरोनावायरस संकट के दौरान एयरफोर्स कैसे काम कर रही है और बजट में कटौती की बात सामने आने के बाद उनके सामने क्या समस्या रहेंगी, इन मुद्दों पर खुलकर बात की।

इंडियन एक्सप्रेस की रिपोर्ट के अनुसार, कोरोना संकट को लेकर एयर चीफ मार्शल आरकेएस भदौरिया ने कहा कि हमने सुनिश्चित किया है कि हमारी परिचालन क्षमता बिल्कुल भी खराब न हो। एयर डिफेंस अलर्ट को बेरोकटोक जारी रखा गया है, जबकि हमारे ट्रांसपोर्ट और हेलीकाप्टर बेड़े लॉकडाउन के दौरान कोविड-19 से संबंधित कार्यों को



संभालने में जुटे हुए हैं। फिर वह राज्य प्रशासन की मदद करना हो यो फिर सरकारी एजेंसियों को समर्थन देना। इसके साथ ही फॉर्बर्ड एरिया में सेना को समर्थन देने के लिए भी एयरफोर्स रखरखाव कार्य में लगी है।

एयर चीफ मार्शल ने कहा कि हमने फरवरी की शुरुआत में प्रीकॉशन्स और प्रीवेंटिव उपाय किए, जैसे आइसोलेशन और क्वारंटीन सेंटर्स तैयार करना। मार्च तक, हमने 1,650 कर्मियों की क्षमता के साथ देशभर में नौ लोकेशन पर क्वारंटीन सुविधाओं की स्थापना की थी।

संकट प्रबंधन केंद्र सभी स्तरों पर स्थापित किए गए थे और एयरफोर्स कर्मियों के लिए एक कोरोना हेल्पलाइन मार्च की शुरुआत से काम कर रही है। भारतीय वायुसेना सामूहिक राष्ट्रीय प्रयास में पूरी तरह से लगी हुई है और मिशन लाइफलाइन उडान और ओप संजीवनी के रूप में लगातार कंधे से कंधा मिलाकर काम कर रही है।

बजट में कटौती

हाल ही में सेना प्रमुख को सरकार ने बजट में 20 प्रतिशत की कटौती का संकेत दिया था। रिपोर्ट के अनुसार, इस बारे में आरकेएस भदौरिया से जब पूछा गया कि इंडियन एयरफोर्स में भी बजट कटौती होती है, तो वे चुनौतियों का सामना कैसे करेंगे। बजट कटौती से IAF के आधुनिकीकरण की योजनाएं कैसे प्रभावित होंगी?

एयर चीफ मार्शल ने कहा कि साल के लिए संशोधित बजटीय अनुमान अभी तक नहीं मिला है। हालांकि, भारतीय वायुसेना पहले ही साल के लिए अपने कैप्टिल और रेवेन्यू व्यय योजनाओं को प्राथमिकता दे रही है। हमारी प्राथमिकता 83 LCA Mk1A के अनुबंध के साथ-साथ उच्च तकनीकी हथियारों जैसे हवा से हवा में मार करने वाली मिसाइल्स और लंबी दूरी की सटीक गाइडेड म्यूनिशन्स का उत्पादन है।

वहीं स्क्वाड्रन को कम करने की बात पर एयर चीफ मार्शल ने कहा कि हम उत्तर और पश्चिम के डेवलपमेंट्स पर निगरानी रखना नहीं छोड़ सकता, क्योंकि हमारे दोनों विरोधी देश लगातार अपने आविष्कारों को बढ़ा रहे हैं और उन्नत कर रहे हैं। अपने लॉन्ग टर्म पर्सपेक्टिव प्लान के तहत इंडियन एयरफोर्स ने मेक इन इंडिया पहल का लाभ उठाते हुए अपनी स्क्वाड्रन शक्ति को एक व्यावहारिक तरीके से बढ़ाने की योजना बनाई है।

<https://www.tv9bharatvarsh.com/india/air-chief-rks-bhaduria-speak-on-coronavirus-crisis-and-air-force-budget-cut-218469.html>

Business Standard

Tue, 19 May 2020

Govt accepts Shekatkar recommendations to boost border roads projects

The recommendations accepted were aimed at speeding up road construction in remote areas, providing easier access to the military and leading to socio economic development in the border areas

By Ajai Shukla

In a major boost to building strategic roads along India's northern border with China, the government on Monday accepted and implemented three important recommendations relating to border infrastructure, made by the Shekatkar Committee in 2016.

The recommendations accepted were aimed at speeding up road construction in remote areas, providing easier access to the military and leading to socio economic development in the border areas.

First, the government has implemented the Shekatkar Committee recommendation "to outsource road construction work beyond optimal capacity of Border Roads Organisation (BRO)."

This is aimed at bringing in private sector road construction agencies and taking the load off a heavily overstretched BRO, which is struggling to maintain the existing network of borders roads

and highways; while also building new roads to areas that have remained outside the road network since independence.

To ensure oversight, the government has made it mandatory to adhere to the Engineering Procurement Contract (EPC) for executing all projects that cost more than Rs 100 crore.

Second, the government has accepted a Shekatkar Committee recommendation that makes it easier to introduce modern construction plant, equipment and machinery. For this, the BRO's "enhanced procurement powers" for domestic and foreign procurements from have been increased from Rs 7.5 crore to Rs 100 crore.

This is deemed essential, with the BRO engaged in sophisticated road and tunnel construction projects, such as the Atal Behari Vajpayee Tunnel near Manali that underpasses the Rohtang Pass; and the 80-kilometre-long road on the Amarnath Yatra route from Dharchula (Uttarakhand) to Lipulekh (China Border).

For projects like these, the "BRO has recently inducted Hot-Mix Plant 20/30 TPH for speedier laying of roads, remote operated hydraulic Rock Drills DC-400 R for hard rock cutting, a range of F-90 series of self-propelled snow-cutters/blowers for speedier snow clearance," stated the defence ministry (MoD).

The BRO is also introducing advanced new technologies to speed up construction, such as precision blasting, use of geo-textiles for soil stabilisation, using cementitious base for pavements and plastic coated aggregates for surfacing.

"With the empowerment of field officers through enhanced delegation of financial and administrative powers, there has been significant improvement in faster financial closure of works," said the MoD

Finally, completing land acquisition and obtaining statutory clearances such as forest and environmental clearance will now be pre-requisites for approving the Detailed Project Report (DPR) for a new road. Work can be awarded only after at least 90 per cent of the statutory clearances have been obtained.

The Shekatkar Committee submitted a total of 99 recommendations. Details of the report and its recommendations have not been placed in the public domain as it "covers operational aspects of the armed forces, disclosure of which is not in the interest of national security," the government told Parliament in February 2019.

https://www.business-standard.com/article/economy-policy/govt-accepts-shekatkar-committee-suggestions-to-boost-border-roads-projects-120051900083_1.html

Outlook
THE FULLY LOADED MAGAZINE

Tue, 19 May 2020

Govt speeding up development of border infra: Defence Ministry

New Delhi: The Defence ministry on Monday said key recommendations of a high-level panel to speed up creation of key infrastructure along the border areas are being implemented.

A committee headed by Lt Gen DB Shekatkar (retd) recommended a series of reforms for the three armed forces as well as to boost border infrastructure.

In the last few years, the government has been focusing on enhancing road networks along the country's nearly 3,500 KM border with China.

"The government has accepted and implemented three important recommendations of committee of experts (CoE) under the Chairmanship of Lt General DB Shekatkar (Retd) relating to border infrastructure. These were related to speeding up road construction," the ministry said in a statement.

In August 2017, the defence ministry approved 65 reform measures for the Indian Army, which included redeployment of nearly 57,000 officers and personnel of other ranks, based on the recommendations of the Shekatkar committee.

The reform measures included optimisation of signal establishments, closure of military farms and army postal wing in peace locations, as well as restructuring of repair echelons, including base workshops.

"The government has implemented recommendation of CoE to outsource road construction work beyond optimal capacity of Border Roads Organisation. It has been made mandatory to adopt Engineering Procurement Contract (EPC) mode for execution of all works costing more than Rs 100 crore," the ministry said.

Under EPC mode, contractors are liable to pay fine for failing to meet deadlines in execution of projects.

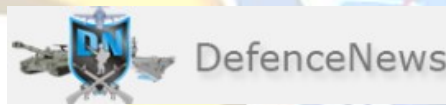
"The other recommendation relating to introduction of modern construction plants, equipment and machinery has been implemented by delegating enhanced procurement powers from Rs 7.5 crore to Rs 100 crore to Border Road Organisation," it said.

The ministry said new technology is also being adopted in laying of roads in border areas as recommended by the CoE.

"The land acquisition and all statutory clearances like forest and environmental clearance are also made part of approval of detailed project report (DPR). Further, with the adoption of EPC mode of execution, it is mandatory to award work only when 90 per cent of the statutory clearances have been obtained," the ministry said.

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

<https://www.outlookindia.com/newscroll/govt-speeding-up-development-of-border-infra-defence-ministry/1838504>



Tue, 19 May 2020

Corporatisation of ordnance factories against country's defence preparedness: Unions

Defence employees unions jointly have called upon the workforce in Ordnance factories to be prepared for indefinite strike and other trade union action in the coming days to fight against the "arbitrary, illegal and unjustified decision of the government to corporatise Ordnance factories and increase the Foreign Direct Investment (FDI) limits in the defence sector".

On May 16, while announcing the fourth round of stimulus measures under the Atma Nirbhar Bharat Nirman Package to deal with the consequences of the COVID-19 pandemic and the lockdown, Union Minister of Finance and Corporate Affairs Nirmala Sitharaman announced that the government is going ahead with corporatisation of the Ordnance Factory Board (OFB) and easing of FDI limits from existing 49% to 74% under the automatic route, but with conditional security clearances. She also said that the OFB factories will be listed in the stock markets in the future.



The move is against the idea of making India Atma Nirbhar or self reliant, says C Srikumar, general secretary of All India Defence Employees Federation (AIDEF). "Corporatisation of the 219 years old ODF is against the interest of defence preparedness of the country. For the last 20 years, successive governments have attempted for ODF privatisation, but with the resistance struggles of

the employees and unions, three union ministers had given written assurance against the privatisation,” Srikumar told NewsClick. He added that a major section of employees of ODF have produced over 20,000 personal protective equipment (PPEs), lakhs of masks, sanitisers and other testing equipment for the needs of the country during the COVID-19 pandemic.

“Instead of appreciating the work of public sector ODF during the crisis, the government is mulling over its corporatisation, risking the handover of 50,000 acres of land owned by ODF and machinery worth thousands of crores to the hands of private players,” he further said.

AIDF, Indian National Defence Workers Federation (INDWF) and Bharatiya Pratiraksha Mazdoor Sangh (BPMS) have jointly called upon the workers in the defence sector to prepare for an indefinite strike and other action plans by the trade unions in the future in opposition against the government’s plans towards privatisation.

Last year, defence employees’ unions had called for a month long strike against the government plans of privatisation of ODF. At that time, the government officials constituted a high level committee on the issue which even consulted with union leaders but its report has not been made public.

Several other trade unions including the Centre of Indian Trade Unions (CITU) and All India Trade Union Congress (AITUC) have condemned the COVID-19 stimulus package announced by the Finance Minister. Calling upon the workers to unite against the government’s privatisation drive, CITU stated that desperate auctioneering of country’s strategic industrial units in defence production, coal and bauxite mining, aviation sector, electricity, space and atomic energy, and other national assets and resources in favour of private and foreign players are severely detrimental to national interests.

On the other side, despite a two-month lockdown to contain the pandemic, the number of COVID-19 positive cases and death due to the disease have been exponentially rising. As of 4 PM on May 18, the total number of confirmed COVID-19 cases was reported as 96,398 and the death toll stood at 3,041.

<https://www.defencenews.in/article/Corporatisation-of-Ordnance-Factories-Against-Country%E2%80%99s-Defence-Preparedness-Unions-830695>



Tue, 19 May 2020

Naval Fighter jets can fly with Air Force when not deployed at sea: IAF

Naval fighter jets such as the MiG-29K can fly with the Indian Air Force in different sectors when they are not deployed at sea, Indian Air Force Chief RKS Bhadauria said on Monday.

"Of course. It is not just a possibility, it has always been a part of the process that if the naval fighters are not deployed at sea, then, they would be deployed with other air force elements for undertaking tasks," he told ANI in an interview.

The Chief was asked about the possibility of using naval fighter aircraft in the western sector or northern border.

He added that: The CDS has already spoken on the issue and all assets will be integrated to achieve our aim."



Recently, the CDS had stated that the naval fighters can be used for flying over the desert sector whenever they are not deployed in the sea.

<https://www.defencenews.in/article/Naval-Fighter-jets-can-fly-with-Air-Force-when-not-deployed-at-sea-IAF-830702>



Tue, 19 May 2020

1st ALH Dhruv helicopter for Coast Guard makes ground firing of 12 mm gun

By Raunak Kunde

The first ALH Dhruv-Mk-III helicopter for the Indian Coast Guard, built by the Hindustan Aeronautical Limited, has made a successful maiden ground firing of 12 mm heavy machine gun which can come handy against pirate vessels or smugglers boats trying to bring in banned contrabands in the country. Helicopter is specially designed by Rotary Wing R&D Centre of HAL and comes with 19 new systems and this helicopters will be deployed by ICG for various roles such as Search and Rescue (SAR), casualty evacuation, armed patrol, coastal surveillance, VIP movement and the night SAR missions.



HAL had signed a contract worth around Rs.5,126 crore in 2017 for supply of 16 ALHs (Fixed Wheel) to ICG in a five year timeframe to boost the Low Intensity Maritime Operations (LIMO) and Coast Security capabilities. The first ALH Dhruv squadron of ICG was commissioned in March 2002 with its operational base at Indian Coast Guard Air Enclave, Goa but this batch of ALH Dhruv-Mk-III are equipped with better Naval payload to perform high intense coastal duties. (Note: Article cannot be reproduced without written permission of idrw.org in any form even for YouTube Videos to avoid Copyright strikes)

<https://idrw.org/1st-alh-dhruv-helicopter-for-coast-guard-makes-ground-firing-of-12-mm-gun/#more-227643>



Tue, 19 May 2020

US government in a hurry to get new sub-hunting helicopters into the hands of the Indian Navy

To say the Pentagon is concerned about China's military expansion would be an understatement — just ask the Indian Navy. According to a report by Paul McLeary for Breaking Defense, the US government was in such a hurry to get sub-hunting helicopters into the hands of the Indian Navy that the Americans gave up some of their own helicopters to fill a rushed delivery early next year.

“This really was one of the higher priorities the [Indian] navy had, to get these aircraft delivered,” Tom Kane, director of Sikorsky's Naval Helicopter Programs told



reporters last week. “I requested that the aircraft be made available on an accelerated basis. So I think there is an urgent need.”

The urgency stems from the decade-long process India has undergone to replace its aging fleet of British-made naval helicopters, as Chinese navy ships, underwater drones and so-called maritime militia civilian-flagged fishing boats spread further into the Indian Ocean, Breaking Defense reported.

With New Delhi in a hurry to begin getting the state-of-the-art helicopters into use, and the US government eager to pull India closer as a hedge against growing Chinese naval capabilities, the US Navy allowed Sikorsky to take three of its brand new MH-60R Sea Hawks and begin modifying them to Indian standards to deliver next spring.

According to The Economic Times, the US\$28 million “Romeo” Seahawk helicopters have advanced combat systems like sensors, missiles, and torpedoes to track and hunt enemy boats and submarines — enough to strike fear in a submarine Captain’s mind.

The Navy will receive new MH-60R’s in a few years to replace them. The remaining 21 helicopters will be delivered in 2023 and 2024, Breaking Defense reported.

Most of the changes being made to the aircraft are in the communications and data sharing realm, Kane told reporters.

“They want the ability to talk to their satellites obviously, so there’s an Indian indigenous SATCOM data link. Also, they can talk to their ships so there’s a link to that they’ve asked us to install, and there’s some other modifications like a floatation system, and other things that we’ll have to [change] from the standard US Navy configuration,” he added.

The MH-60R was born to be a sub hunter, however, and that mission will remain central to the Indian configuration, Breaking Defense reported.

“They’ll come off the line as ASW [anti-submarine warfare] aircraft so they’ll have the active dipping sonar,” the AN/APS-153 radar “and things that you would normally see on a US Navy configuration,” Kane told reporters.

According to Defense News, the helicopters are to be armed with multi-mode radar, Hellfire missiles, Mark 54 torpedoes and precision-kill rockets. They are also to be used in limited intelligence gathering roles, for surveillance missions, and in search and rescue efforts, Defense News reported.

The deal is the largest contract Sikorsky has signed with the Indian government. Unlike most other programs, it’s not subject to the “Make in India” effort launched by Indian Prime Minister Narendra Modi, Breaking Defense reported.

The company did not sign an offset agreement with India on the project, “so we will put more indirect work over in India,” Kane said.

The Indian defense industry will also likely be involved in any maintenance and retrofit efforts on the aircraft in the coming years.

<https://idr.org/us-government-in-a-hurry-to-get-new-sub-hunting-helicopters-into-the-hands-of-the-indian-navy/#more-227646>



Tue, 19 May 2020

Defence reforms: L&T seeks clarity on list of banned weapons

The government should notify the list of banned weapons and platforms with well-defined phase and year-wise timelines in advance to provide a clear road-map for the Indian industry to build capacity and capability, foster indigenous R&D and innovation, said a top official with Larsen & Toubro, one of the leading defence equipment manufacturers in the country.

Finance Minister Nirmala Sitaraman on Saturday announced a series of measures to boost investments in India's defence and aerospace sector, as part of the tranche 4 of Rs 20 lakh crore economic stimulus. JD Patil, Whole-time Director (Defence & Smart Technologies) and Senior Executive Vice President, Larsen & Toubro said the defence policy reforms would provide long-term visibility which is much needed to drive investments in this sector. Commenting on the move on indigenisation of imported spares, he said significant opportunities, especially for MSMEs, will open up on tie-ups with Original Equipment Manufacturers (OEMs).

L&T, which had created huge capacities in defence, aerospace and ship building space in the past, was suffering from inadequate orders due to delays in tendering and lack of favourable policy environment. Out of its consolidated order book inflow worth Rs 1,28,600 crore for the nine months of FY20, defence engineering contribution was only one percent. Similarly, of the overall order book of Rs 3,06,300 crore by the end of December quarter of FY20 (Q3 FY20), defence engineering constitutes only 3 percent. Its net revenues in the nine months from the sector was Rs 3,005 crore, a 14% increase compared to the previous year, mainly due to a large artillery gun order.

“A separate budget for domestic capital procurement will protect the indigenous programs that have seen repeated deferment given budget constraints caused by big ticket G-to-G contracts,” he said. This will bring in a renewed focus on indigenous defence production, build confidence of Indian private sector companies to invest and build capability. It will also provide assurance to the supply-chain ecosystem of continued utilisation of built-up capacity.

Similarly, a decision on time-bound procurement process and faster decision making will accelerate the contracting process and production cycles. It will make the equipment available within technological life cycles and at lower costs by cutting down on inflation component, working capital costs, and foreign exchange rate variations associated with longer cycles, he said.

<https://idr.org/defence-reforms-lt-seeks-clarity-on-list-of-banned-weapons/#more-227632>

US Marines change course in the Pacific: What does it mean for India?

By Grant Newsham

Change isn't always easy. Even for US Marines.

But as China's military capabilities continue to improve at an alarming rate, the Marines are planning to reconfigure themselves to take on the People's Liberation Army in the Western Pacific. The Marine initiative is a gamble with uncertain prospects, but it might be relevant for the Indian Armed Forces.

In mid-2019, after nearly 20 years of focus on the Middle East and Afghanistan, United States Marine Corps (USMC) Commandant General David Berger declared the maritime Asia-Pacific was now the Corps' priority theater.

And Berger was clear—it is all about China.

This is requiring a re-think of the Marine Corps' traditional approach in the Pacific: large amphibious forces sailing unmolested and bulling their way ashore to vanquish enemies. Think Iwo Jima.

That won't work against China. Besides the idea of landing on the Chinese mainland being madness, amphibious flotillas are fat targets for Chinese missiles. So are large support bases. And it will get even worse as China develops even "smarter" long-range weapons and sophisticated surveillance networks.

In fact, the PLA has been studying the US military since at least 1989, figuring out its weak points and how to defeat it. They've done well.

So what does the Marine Commandant have in mind? Use geography to his advantage and fight from a strategic defensive.

He outlined more details last month with the publication of "Force Design 2030"—the specific adjustments the Marine Corps will make to carry out the Pacific strategy.

The highlights include cutting several infantry battalions, eliminating all tanks (not considered useful for coastal fighting), and replacing about three-fourths of "regular" artillery with long-range missile and rocket batteries. Fighter aircraft, helicopters, and amphibious assault vehicles will be reduced.

There will be more and improved long range UAVs (unmanned aerial vehicles) for both surveillance and attack.

The idea is to conform to the geography. The Asia-Pacific has many islands and archipelagoes with narrow confined seas. Small units of Marines occupying or seizing key terrain and using their own anti-ship missiles, long-range rockets, and air defence weapons, can easily turn nearby seas (and skies) into no-go zones—eventually stretching out hundreds of miles as improved weapons come on-line.

The Commandant's planners are simply employing their own version of China's "anti access/area denial" (A2/AD) strategy—using a range of weapons to prevent or impede the ability of adversary forces to operate in given territory—sea, air, and land—and far away.

The Marines can defend along the so-called first island chain that stretches from Japan to Taiwan to the Philippines and on to Indonesia—and hems in the Chinese mainland (it's worth considering that China is effectively using its "string of pearls" ports in Myanmar, Sri Lanka, Pakistan and elsewhere to create its own "island chain" around India). The net effect is a deadly 'web' that will make for a long afternoon for PLA ships and aircraft trying to break out into the

Pacific Ocean – or even just operate inside the first island chain. The ‘web’ also provides cover for the US Navy as it maneuvers.

Smaller, mobile units of Marines armed with long-range precision weapons throughout the region are also more survivable.

Think of it from the PLA’s perspective: hammering an American base on Guam or Okinawa is one thing. But locating and destroying mobile Marine anti-ship missile launchers on East Asian coastlines – and often hidden in easily moved shipping containers (of which there are a few million) is another.

So in theory, the PLA can’t locate the Marines and their weapons, but the Marines can find Chinese targets and hit them accurately from very long distances.

The Marine Corps’ Challenges

The biggest challenge? Where to put the Marines. The welcome mat isn’t out anywhere just yet – except perhaps Guam. This needs to be done before the shooting starts – rather than trying to get in, uninvited, at the last minute.

The Marines will also require more and different types of ships – smaller and faster – to keep the detachments mobile and supplied. This is easier said than done. The US Navy hasn’t got enough ships, and its ship building plans and budgets are, to put it charitably, uncertain.

The Marine detachments also need to be inconspicuous. Shipping containers with missiles inside are easy to hide, but military age Westerners tend to stand out in all parts of Asia. And there are Chinese and their paid friends all over the Pacific who might notice.

Moreover, the PRC isn’t standing still. Its economic inroads throughout the region also equal political influence. Beijing ultimately wants military presence, but just being able to keep the Americans from ‘getting in’ – as might be happening in the Philippines – is advantage enough for now.

The Marines will need partners to make this scheme most effective. Within the Pacific, working with the Japanese and the Australians should be easy. Working with other friends in the region is made easier since long-range precision weapons are a useful “asymmetric” capability for most potential partners, something that could be relevant for India as well. It adds more value than simply “gifting” a refurbished patrol boat or a helicopter or two. And it finally gives partners a real capability to defend their territory and resist Chinese intimidation.

Is General Berger’s scheme a sea change for the Marine Corps?

That’s hard to say. He will be gone in a few years and his successor may be less interested in the Indo-Pacific. Or if a conflict breaks out—say in the Middle East—Asia might once again be a lesser priority, even as the PLA buildup continues.

An industry and Congressional counterattack is inevitable if the Marines plan to buy fewer F35 fighters, but there is also opposition from within the Marine Corps—and especially from former-Marines.

Sceptics argue the Commandant is over-focusing on a single enemy and in a particular location—while Marines are expected to operate in “every clime and place” as the Marine Hymn promises.

Additionally, one might think the Commandant has decided the Corps won’t be doing “sustained ground combat”, just short littoral (coastal) fights. The critics bristle at the idea the Marine Corps—the nation’s “force in readiness” is primly choosing its fights rather than doing whatever the nation needs.

Regardless of criticisms—that have more to do with perceived effects of the Commandant’s plan on the larger Marine Corps and its operational capabilities—the basic re-design concept for taking on the PRC in the Western Pacific is a good one.

Technology and PLA capabilities have made it too hard to fight the way the Marine Corps always has. So it adjusts. And in the process presents the Chinese with an unexpected and unwanted challenge.

As described, the Marines are setting up a complex, mobile defence—using advanced weaponry and technology while making themselves a hard target—and letting the Chinese try to fight through it. And the more partners you bring into the mix, the better. The PLA may decide it's not worth the cost.

Indian defence planners might find what the Marines have in mind relevant. The concept applies in the IOR just as well as the Western Pacific. With a little imagination one imagines a number of employment schemes that can turn large swaths of the Indian Ocean into areas the Chinese military will operate only at great risk.

And it might be worth hurrying.

Chinese military activities and encroachment in the Indian Ocean are well underway and have been a worry for many years. These will continue and increase—no matter what forbearance India shows the PRC in the South China Sea.

A designated Indian Marine Corps is not a requirement. Amphibious trained Army troops will do fine.

Other nations in the region and on the Indian Ocean rim might welcome the chance to get involved with the program and improve their capabilities. This also tends to deepen political ties, can be useful during natural disasters and be a part of India's exercises with its own partners beyond in the Pacific.

This is all of course just one piece of the puzzle for defending the IOR—and requires close cooperation with naval and air forces to succeed. And it does not reduce the need for submarines, warships, fighters, UAVs, anti-submarine warfare and surveillance capabilities, and ground forces and necessary hardware as well.

Importantly, the concept is a golden opportunity to add some real substance to the India-US defence relationship by having the US Marines and the Indian Armed Forces work on this together.

But why should an Indian version of the US Marine scheme be a priority? Sometimes you can assess the value of a plan or a weapon or piece of hardware by asking if you would mind if the enemy had or was employing it.

If the PLA set up something akin to General Berger's plan in the IOR, would it be a problem? Say, for example, an anti-ship missile network in the Maldives, or mobile detachments on the Myanmar coast. Or, even more difficult to find and destroy, the PLA using the "string of pearls" ports and ships China has, encircling India to launch fast, coordinated attacks on Indian assets and installations from its vast mobile cargo network.

That would be a problem.

And it's hard to think otherwise.

(Col. Grant Newsham (Ret.) is a senior research fellow at the Japan Forum for Strategic Studies and a retired US Marine officer.)

<https://www.sundayguardianlive.com/opinion/us-marines-change-course-pacific-mean-india>



Tue, 19 May 2020

ISRO to reach out to private sector more for manned missions

The call for private sector participation had been made even before the announcement by Union Finance Minister Nirmala Sitharaman two days back that the space sector will be opened up for private sector participation

By Deepa Balakrishnan

The Indian Space Research Organisation (ISRO) had already called out for private companies to help with technology development in the prestigious Gaganyaan manned mission project and would make these outreach efforts more robust in coming days, Isro Chairman Dr K Sivan told News18.com. The call for private sector participation had been made even before the announcement by Union Finance Minister Nirmala Sitharaman two days back that the space sector will be opened up for private sector participation, as one among the slew of fiscal measures to improve the economy.

"We had already announced that opportunity for private people to carry out technology development in Gaganyaan. We will take it to other areas also. As per government direction, we want to allow private people to participate, allow them to do their space activity," Dr Sivan told news18. The manned mission or human space flight project that Isro is working on envisages sending astronauts on a home-built spacecraft to space on a five-to-seven-day mission by 2022, to coincide with 75 years of India's independence. This would be the first such attempt, and four IAF pilots have been sent to Russia in late-January for a year-long astronaut training programme.

The training programme, however, has been delayed because of a lockdown in Russia as well. "The training will resume once the lockdown is over. There is a likely delay, but we hope to be able to make up for lost time," Dr Sivan said, when asked if the lockdown will delay its plans on the overall mission itself.

Asked to what extent, private sector participation is envisaged with regard to either training equipment or other elements and components for the manned mission, Dr Sivan said that there is a broad invitation to the private sector to send proposals. These are yet to be collated and scrutinised. Apart from Gaganyaan, Isro is also planning a third moon mission -- Chandrayaan 3 -- next year, which will mostly replicate the unrealised goals of landing a lander and a rover on the moon that Chandrayaan 2 failed to do. Chandrayaan 2 had involved as many as 620 companies in either developing systems or components. "For Chandrayaan 3, we have to see and discuss how far we can do this. Definitely we will allow them (private companies) to do whatever possible," Dr. Sivan said.

<https://www.news18.com/news/tech/isro-to-reach-out-to-private-sector-more-for-manned-missions-2626011.html>

A theoretical boost to nano-scale devices

Researchers calculate the quasi-Fermi levels in molecular junctions applying an initio approach

Semiconductor companies are struggling to develop devices that are mere nanometers in size, and much of the challenge lies in being able to more accurately describe the underlying physics at that nano-scale. But a new computational approach that has been in the works for a decade could break down these barriers.

Devices using semiconductors, from computers to solar cells, have enjoyed tremendous efficiency improvements in the last few decades. Famously, one of the co-founders of Intel, Gordon Moore, observed that the number of transistors in an integrated circuit doubles about every two years--and this 'Moore's law' held true for some time.

In recent years, however, such gains have slowed as firms that attempt to engineer nano-scale transistors hit the limits of miniaturization at the atomic level.

Researchers with the School of Electrical Engineering at KAIST have developed a new approach to the underlying physics of semiconductors.

"With open quantum systems as the main research target of our lab, we were revisiting concepts that had been taken for granted and even appear in standard semiconductor physics textbooks such as the voltage drop in operating semiconductor devices," said the lead researcher Professor Yong-Hoon Kim. "Questioning how all these concepts could be understood and possibly revised at the nano-scale, it was clear that there was something incomplete about our current understanding."

"And as the semiconductor chips are being scaled down to the atomic level, coming up with a better theory to describe semiconductor devices has become an urgent task."

The current understanding states that semiconductors are materials that act like half-way houses between conductors, like copper or steel, and insulators, like rubber or Styrofoam. They sometimes conduct electricity, but not always. This makes them a great material for intentionally controlling the flow of current, which in turn is useful for constructing the simple on/off switches--transistors--that are the foundation of memory and logic devices in computers.

In order to 'switch on' a semiconductor, a current or light source is applied, exciting an electron in an atom to jump from what is called a 'valence band,' which is filled with electrons, up to the 'conduction band,' which is originally unfilled or only partially filled with electrons. Electrons that have jumped up to the conduction band thanks to external stimuli and the remaining 'holes' are now able to move about and act as charge carriers to flow electric current.

The physical concept that describes the populations of the electrons in the conduction band and the holes in the valence band and the energy required to make this jump is formulated in terms of the so-called 'Fermi level.' For example, you need to know the Fermi levels of the electrons and holes in order to know what amount of energy you are going to get out of a solar cell, including losses.

But the Fermi level concept is only straightforwardly defined so long as a semiconductor device is at equilibrium--sitting on a shelf doing nothing--and the whole point of semiconductor devices is not to leave them on the shelf.

Some 70 years ago, William Shockley, the Nobel Prize-winning co-inventor of the transistor at the Bell Labs, came up with a bit of a theoretical fudge, the 'quasi-Fermi level,' or QFL, enabling

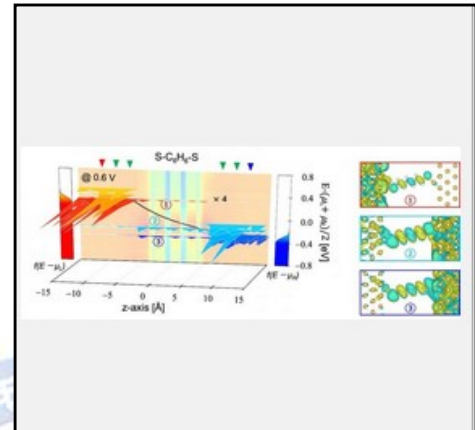


Image: The newly developed formalism and QFL splitting analysis led to new ways of characterizing extremely scaled-down semiconductor devices and the technology computer-aided design (TCAD) of next-generation nano-electronic/energy/bio devices....

rough prediction and measurement of the interaction between valence band holes and conduction band electrons, and this has worked pretty well until now.

"But when you are working at the scale of just a few nanometers, the methods to theoretically calculate or experimentally measure the splitting of QFLs were just not available," said Professor Kim.

This means that at this scale, issues such as errors relating to voltage drop take on much greater significance.

Kim's team worked for nearly ten years on developing a novel theoretical description of nano-scale quantum electron transport that can replace the standard method--and the software that allows them to put it to use. This involved the further development of a bit of math known as the Density Functional Theory that simplifies the equations describing the interactions of electrons, and which has been very useful in other fields such as high-throughput computational materials discovery.

For the first time, they were able to calculate the QFL splitting, offering a new understanding of the relationship between voltage drop and quantum electron transport in atomic scale devices.

In addition to looking into various interesting non-equilibrium quantum phenomena with their novel methodology, the team is now further developing their software into a computer-aided design tool to be used by semiconductor companies for developing and fabricating advanced semiconductor devices.

The study, featured at the *Proceedings of the National Academy of Sciences of the USA* on May 12, was supported by the National Research Foundation and the Korea Institute of Science and Technology Information Supercomputing Center.

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https://www.eurekalert.org/pub_releases/2020-05/tkai-atb051720.php



Tue, 19 May 2020

Stretch and flow: Research sheds light on unusual properties of well-known materials

Toothpaste, face creams, hair gel, mayonnaise, and ketchup are household items that most people don't think twice about but, in terms of their flow behavior, they have unusual properties. They're all elasto-visco-plastic (EVP) materials, which behave like solids when at rest but can yield to flow like liquids when placed under enough stress. Despite how common these materials are, our ability to model and predict their behavior relies on a theory that has only been shown to work under certain conditions.

Scientists from the Micro/Bio/Nanofluidics Unit at the Okinawa Institute of Science and Technology Graduate University (OIST) and the Laboratory of Fluid Mechanics and Rheology at the University of Patras have revealed insights about these materials by combining experiments with simulations. Their research, published in PNAS, suggests that the materials' elasticity in its solid-like state is a key property that should be included in future models.

"Over the last decade, advances in microfluidics experiments have revealed many unexpected phenomena in

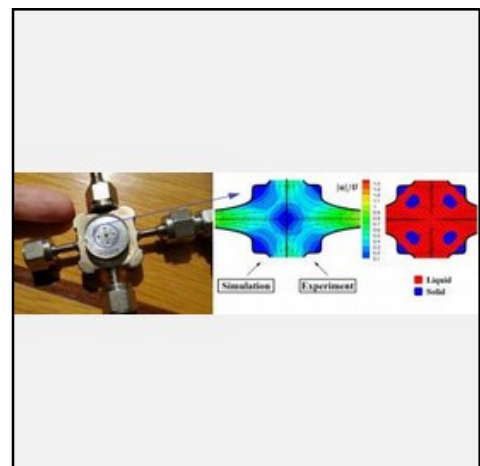


Image: These are the results of the simulations matched the results of the experiments. [view more](#)

the flow of EVP materials," said Professor John Tsamopoulos, from the University of Patras. "Examples include the cusped shapes of bubbles in the gels and the loss of symmetry in the flow. These, and other observations, hinted that something was missing from the existing theory. Previous research in our lab suggested that elasticity, the ability of the material's microstructure to deform before yielding, was the missing part of the puzzle."

Professor Amy Shen, who leads the OIST Unit, emphasized the importance of this research. "Even when basic household items are set aside, having a fundamental understanding of how EVP materials flow is very useful, especially in biomedical science and geophysics." For example, she explained, blood is an EVP material - it behaves like a solid at rest but flows like a liquid in arteries. What's more, she added, some 3D-printed tissues and scaffolds can have EVP properties, and, on the geophysics side, volcanic lava behaves like an EVP material albeit on a much larger scale.

Previous experimental research on EVP materials has measured their behavior under shear flow, obtained when layers of fluid slide past each other. But, when it comes to the industrial processing and uses of these materials, such as fiber-spinning and circuit-board printing, it's often the extensional flow - when the fluid is stretched - that's more important.

The study of purely extensional flows is a great challenge in experimental fluid dynamics, and the extensional flow of EVP materials has never previously been successfully measured in experiments. To achieve this for the first time, Dr. Simon Haward, the group leader from the Micro/Bio/Nanofluidics Unit, used a novel microfluidic apparatus known as a cross-slot geometry. The apparatus comprised four channels that were all at right angles to each other.

"Inside the cross-slot geometry, we used a Pluronic solution, a well-known EVP material," said Dr. Haward. "When we put pressure on the two inbound channels, which were located opposite to each other, the solution was pushed towards the center point and it came out of the other two channels. The resulting flow has a point at the center where the velocity goes to zero. In the two outbound channels, we generated an extensional flow where the fluid was stretched."

Meanwhile, Professor Yannis Dimakopoulos and researchers at the University of Patras created a theoretical model and simulated the flow of two EVP materials - the Pluronic solution and another material called Carbopol. They showed that complex patterns arose in the flow, which included the presence of solidified regions surrounded by the liquid-state. Their findings matched the experiments performed at OIST.

"This model can describe simple EVP materials in shear, extensional and mixed flows. Although we only focused on two materials, it could be used on a wide variety with varying levels of elasticity, plasticity, viscosity, and other properties," said Stelios Varchanis, a Ph.D. candidate at the University of Patras and first author of the paper. "This makes the model appropriate for simulating flows during the design and optimization of various industrial processes."

This research suggests that the existing theory needs to be overhauled to include the elasticity of the material. "Depending on the amount of deformation that the EVP material can sustain before yielding, it will either behave in a way close to what is predicted by the existing theory or will behave more like a flowing elastic-solid," said Stelios.

"The experiments at OIST complimented the simulations," said Dr. Cameron Hopkins, from the OIST Micro/Bio/Nanofluidics Unit. "Even though the Pluronic solution that we studied only exhibits weak elastic effects, a small amount of asymmetry was observed in the flow indicating a deviation from purely fluid-like behavior, so the elasticity cannot be neglected. Our experiments provided strong support for the proposed modification of the theory."

This research also involved Dr. Alexandros Syrakos from the University of Patras.

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Highly efficient charge-to-spin interconversion in graphene heterostructures

KAIST physicists described a route to design the energy-efficient generation, manipulation and detection of spin currents using nonmagnetic two-dimensional materials. The research team, led by Professor Sungjae Cho, observed highly efficient charge-to-spin interconversion via the gate-tunable Rashba-Edelstien effect (REE) in graphene heterostructures

KAIST physicists described a route to design the energy-efficient generation, manipulation and detection of spin currents using nonmagnetic two-dimensional materials. The research team, led by Professor Sungjae Cho, observed highly efficient charge-to-spin interconversion via the gate-tunable Rashba-Edelstien effect (REE) in graphene heterostructures.

This research paves the way for the application of graphene as an active spintronic component for generating, controlling, and detecting spin current without ferromagnetic electrodes or magnetic fields.

Graphene is a promising spintronic component owing to its long spin diffusion length. However, its small spin-orbit coupling limits the potential of graphene in spintronic applications since graphene cannot be used to generate, control, or detect spin current.

"We successfully increased the spin-orbit coupling of graphene by stacking graphene on top of 2H-TaS₂, which is one of the transition metal dichalcogenide materials with the largest spin-orbit coupling. Graphene now can be used to generate, control, and detect spin current," Professor Cho said.

The Rashba-Edelstein effect is a physical mechanism that enables charge current-to-spin current interconversion by spin-dependent band structure induced by the Rashba effect, a momentum-dependent splitting of spin bands in low-dimensional condensed matter systems.

Professor Cho's group demonstrated the gate-tunable Rashba-Edelstein effect in a multilayer graphene for the first time. The Rashba-Edelstein effect allows the two-dimensional conduction electrons of graphene to be magnetized by an applied charge current and form a spin current. Furthermore, as the Fermi level of graphene, tuned by gate voltage, moves from the valence to conduction band, the spin current generated by graphene reversed its spin direction.

This spin reversal is useful in the design of low-power-consumption transistors utilizing spins in that it provides the carrier "On" state with spin up holes (or spin down electrons) and the "Off" state with zero net spin polarization at so called "charge neutrality point" where numbers of electrons and holes are equal.

"Our work is the first demonstration of charge-to-spin interconversion in a metallic TMD (transition-metal dichalcogenides) and graphene heterostructure with a spin polarization state controlled by a gate. We expect that the all-electrical spin-switching effect and the reversal of non-equilibrium spin polarization by the application of gate voltage is applicable for the energy-efficient generation and manipulation of spin currents using nonmagnetic van der Waals materials," explained Professor Cho.

Story Source:

Materials provided by [The Korea Advanced Institute of Science and Technology \(KAIST\)](https://www.kaist.ac.kr/).

Note: Content may be edited for style and length.

Journal Reference:

- Lijun Li, Jin Zhang, Gyuho Myeong, Wongil Shin, Hongsik Lim, Boram Kim, Seungho Kim, Taehyeok Jin, Stuart Cavill, Beom Seo Kim, Changyoung Kim, Johannes Lischner, Aires Ferreira, Sungjae Cho. **Gate-Tunable Reversible Rashba-Edelstein Effect in a Few-Layer Graphene/2H-TaS₂ Heterostructure at Room Temperature.** *ACS Nano*, 2020; DOI: [10.1021/acsnano.0c01037](https://doi.org/10.1021/acsnano.0c01037)
<https://www.sciencedaily.com/releases/2020/05/200518144942.htm>

S&T researcher examines if AI have a mind of their own

By Peter Ehrhard

Most people encounter artificial intelligence (AI) every day in their personal and professional lives. Without giving it a second thought, people ask Alexa to add soda to a shopping list, drive with Google Maps and add filters to their Snapchat – all examples of AI use. But a Missouri University of Science and Technology researcher is examining what is considered evidence of AIs having a “mind,” which will show when a person perceives AI actions as morally wrong.



Dr. Daniel Shank, an assistant professor of psychological science at Missouri S&T, is building on a theory that if people perceive entities to have a mind, that outlook will determine what moral rights and responsibility they attribute to it. His research would show when a person perceives AI actions as morally wrong and possibly serve to reduce smart device rejection and improve the devices.

“I want to understand the social interactions in which people perceive a machine to have mind and the situations they perceive it to be a moral agent or victim,” says Shank.

Shank’s behavioral science work applies the theory to advanced machines such as AI agents and robots.

“The times when we do perceive a mind behind the machine tells us something about the technologies, their capacities and their behaviors, but they ultimately reveal more about us as humans,” Shank explains. “In these encounters, we emotionally process the gap between nonhuman technologies and having a mind, essentially feeling our way to machine minds.”

Shank is in the middle of a three-year project, funded by the Army Research Office (ARO), to better understand people’s perception of AI. ARO is an element of the U.S. Army Combat Capabilities Development Command’s Army Research Laboratory.

In his first year of research, he collected qualitative descriptions of the personal interactions people had with AIs that either involved a moral wrong or involved the person perceiving the AI to have “a lot of mind.” Shank’s research found that 31 percent of respondents reported exposure of personal information and 20 percent reported exposure to undesirable content – both of which Shank argues are reported due to their frequent occurrence on personal and home devices.

“Dr. Shank’s work is generating new understandings of human-agent teaming by systematically integrating longstanding social psychological theories of cognition and emotion with research on human-agent interaction,” says Dr. Lisa Troyer, program manager for social and behavioral sciences at the ARO. “His research is already generating scientific insights on the role of moral perceptions of autonomous agents and how those perceptions impact effective human-agent teaming.”

Currently in his second year of the research, he is conducting controlled experiments where the level of mind in the AI is varied and then the AI is the perpetrator or victim of a moral act. Shank hopes this will allow him to draw more direct comparisons between AI and humans. So far, his research finds that while some AIs such as social robots can assume greater social roles, human acceptance of an AI in those roles enhanced both perception of mind and emotional reactions.

The final phase of his research will use surveys and simulations to understand if levels of morality can be predicted by the impressions people have of the AI.

“Technologies connected with the web, trained on big data and operating across social networking platforms are now commonplace in our culture,” says Shank. “These technologies, whether they are proper artificial intelligence or not, are routine in people’s personal lives, but not every use of these technologies causes us to see them as having a mind.”

The question of whether virtue or vice can be attributed to AI still depends on if humans are willing to judge machines as possessing moral character. And as research into AI ethics and psychology continues, new subjects are being considered such as AI rights and AI morality.

<https://news.mst.edu/2020/05/st-researcher-examines-if-ai-have-a-mind-of-their-own/>

COVID-19 Research News

INDIA
TODAY

Tue, 19 May 2020

Ashwagandha can be effective Covid-19 preventive drug, finds IIT Delhi, Japan AIST's research

The natural compounds from Ashwagandha and Propolis have the potential to be an effective novel coronavirus preventive drug, according to the research team.

New Delhi: Ayurvedic herb Ashwagandha can be an effective therapeutic and preventive drug against the Covid-19 infection, a collaborative research by IIT-Delhi and Japan's National Institute of Advanced Industrial Science and Technology (AIST) has found.

The natural compounds from Ashwagandha and Propolis have the potential to be an effective novel coronavirus preventive drug, according to the research team.

"The researchers targeted the main SARS-CoV-2's enzyme for splitting proteins, known as the main protease (Mpro) that plays a key role in mediating viral replication. This is an attractive drug target for this virus, and as humans don't naturally have this enzyme, compounds that target Mpro are likely to have low toxicity," said D Sundar, head of the Delhi Indian Institute of Technology's Biotechnology department.



File image for representation: PTI

"The findings may not only connect to save time and cost required for screening for anti-Covid-19 drugs, but may also offer some preventive and therapeutic value for the management of fatal Covid-19 pandemic, and hence, warrant prioritized validation in the laboratory and clinical tests," he said.

The drug's development may take some time, and in the current scenario, these natural resources -- Ashwagandha and Propolis -- can offer some preventive or even therapeutic value, according to Sundar.

He said that "although these are easily available and affordable, one has to be cautious about the content of bioactive ingredients. CAPE, while is a major component of propolis, its amount and stability are critical factors that could be managed by generating its complex with cyclodextrins".

"Withanone, on the other hand, varies with geography, parts and size of the Ashwagandha plant. So, in order to acquire or appreciate particular effects, we must use the right and quality-controlled resource and extracts," Sundar said.

The government has also initiated a study on whether Ashwagandha can be an alternative to anti-malarial drug Hydroxychloroquine (HCQ) as a potential Covid-19 preventive.

The study is being carried out by a group of scientists and researchers from the Ministry of AYUSH, Ministry of Health and Family Welfare, University Grants Commission (UGC) and Indian Council of Medical Research (ICMR). "While new line of drug and vaccine development have been initiated worldwide, in the current scenario of high infected numbers, severity of the disease and high morbidity, repurposing of the existing drugs are heavily explored by recruiting integrative genomics and bioinformatics research tools," Sundar said.

"While well-trusted reputation of Ashwagandha as an immunity enhancer forms a basis of the recent initiative of the Indian government in forming an Interdisciplinary Task Force to launch its clinical research studies related to SARS-CoV-2 and the Covid-19 disease, the current research report of this team provide hints on its direct anti-viral activities," he said.

The novel coronavirus has claimed over three lakh lives with over 48 lakh people infected across the globe. In India, 3,029 people have died due to the disease and 91,169 have been infected.

<https://www.indiatoday.in/science/story/ashwagandha-effective-covid19-preventive-drug-iit-delhi-japan-aist-research-1679361-2020-05-18>

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Tue, 19 May 2020

Covid-19: कोरोना के खिलाफ प्रभावी औषधि हो सकती है अश्वगंधा: शोध

देहरादून: कोरोना संक्रमण को फैलने से रोकने के लिए डीआरडीओ के वैज्ञानिक शबीर अहमद ने लॉकडाउन में दो मशीनों का निर्माण किया है। उनकी दूसरी मशीन एक मैकेनाइज्ड सेनेटाइजिंग यूनिट (एमईएसयू) है। जिसकी मदद से बिना छूए ही सेनेटाइजर का इस्तेमाल किया जा सकता है।

आयुर्वेदिक जड़ी-बूटी अश्वगंधा कोविड-19 संक्रमण के खिलाफ उपचारात्मक और इसकी रोकथाम करने वाली एक प्रभावी औषधि हो सकती है। आईआईटी दिल्ली और जापान के एक प्रौद्योगिकी संस्थान के अनुसंधान में यह पाया गया है।

अनुसंधान दल के मुताबिक, अश्वगंधा और 'प्रोपोलीस (मधुमक्खी के छत्ते के अंदर पाया जाने वाला मोमी गोंद) के प्राकृतिक यौगिक में कोरोना वायरस की रोकथाम करने वाली औषधि बनने की क्षमता है।

भारतीय प्रौद्योगिकी संस्थान (आईआईटी), दिल्ली के जैव प्रौद्योगिकी विभाग के प्रमुख डी सुंदर ने कहा, 'अध्ययन दल में शामिल वैज्ञानिकों ने अनुसंधान के दौरान वायरस की प्रतिकृति बनाने में मुख्य भूमिका निभाने वाले मुख्य सार्स-कोविड-2 एंजाइम को शोध का लक्ष्य बनाया।'

उन्होंने कहा, 'अनुसंधान के नतीजे न सिर्फ कोविड-19 रोधी औषधियों के परीक्षण के लिए जरूरी समय और लागत को बचा सकते हैं, बल्कि वे कोरोना वायरस महामारी के प्रबंधन में भी महत्वपूर्ण साबित हो सकते हैं। इसलिए, इसकी प्रयोगशाला में और चिकित्सीय परीक्षण किए जाने की जरूरत है।'

सुंदर के मुताबिक औषधि विकसित करने में कुछ वक्त लग सकता है और मौजूदा परिदृश्य में ये प्राकृतिक संसाधन -अश्वगंधा एवं प्रोपोलीस--चिकित्सीय महत्व वाले हो सकते हैं। यह अनुसंधान आईआईटी दिल्ली के साथ जापान के नेशनल इंस्टीट्यूट ऑफ एडवांस्ड इंडस्ट्रियल साइंस एंड टेक्नोलॉजी (एआईएसटी) ने किया है।

उल्लेखनीय है कि सरकार ने इस बारे में भी एक अध्ययन शुरू किया है कि क्या अश्वगंधा कोविड-19 की रोकथाम करने वाली संभावित दवा के रूप में मलेरिया रोधी औषधि हाइड्रोक्सीक्लोरोक्वीन का विकल्प बन सकता है।

<https://www.livehindustan.com/lifestyle/story-covid-19-a-new-research-finds-that-ashwagandha-herb-may-be-effective-drug-to-fight-against-corona-virus-3224166.html>



Tue, 19 May 2020

ICMR revises coronavirus COVID-19 testing strategy: All you need to know

The Indian Council of Medical Research (ICMR) has revised the coronavirus COVID-19 testing strategy, which included testing of all symptomatic influenza like illness (ILI) among returnees and migrants within 7 days of illness.

Edited by Namrata Agarwal

New Delhi: The Indian Council of Medical Research (ICMR) has revised the coronavirus COVID-19 testing strategy, which included testing of all symptomatic influenza like illness (ILI) among returnees and migrants within 7 days of illness.

Also, all symptomatic health care workers, frontline workers working towards mitigating COVID-19 crisis will be tested.

In a press note issued on Monday (May 18,2020), the organisation outlined its new strategy.

1. All symptomatic (ILI symptoms) individuals with history of international travel in the last 14 days.
2. All symptomatic (ILI symptoms) contacts of laboratory confirmed cases.
3. All symptomatic (ILI symptoms) health care workers / frontline workers involved in containment and mitigation of COVID19.
4. All patients of Severe Acute Respiratory Infection (SARI).
5. Asymptomatic direct and high-risk contacts of a confirmed case to be tested once between day 5 and day 10 of coming into contact.
6. All symptomatic ILI within hotspots/containment zones.
7. All hospitalised patients who develop ILI symptoms.
8. All symptomatic ILI among returnees and migrants within 7 days of illness.
9. No emergency procedure (including deliveries) should be delayed for lack of test.

An ILI case is defined as one with acute respiratory infection and with fever and cough, while SARI is acute respiratory infection with fever and the patient requiring hospitalisation.

The ICMR said all testing in the categories mentioned in the guideline, is recommended by real-time RT-PCR test only.

<https://zeenews.india.com/india/icmr-revises-coronavirus-covid-19-testing-strategy-all-you-need-to-know-2284535.html>

COVID-19: UK to spend rs 4.5cr on research to test if dogs can detect virus by sniffing

In a bid to develop a fast means of detecting the Coronavirus, British researchers are all set to conduct a test on dogs' ability to sniff and detect the virus.

By Manjiri Chitre

In a bid to develop a fast means of detecting the Coronavirus, British researchers are all set to conduct a test on dogs' ability to sniff and detect the virus. According to reports, at least six dogs including labradors and cocker spaniels will be given intensive training by giving them samples of the odour of COVID-19 patients from hospitals in London. During the training, they will be taught to distinguish the odour of COVID-19 patients to that those who are not infected.

The Britain government has given \$606,000 towards this research which will be conducted by the London School of Hygiene and Tropical Medicine, Durham University, and a British charity, Medical Detection Dogs. Researchers suggest that if the dogs are successful in identifying COVID patients, they can check up to 250 people in an hour. Further, the dogs can be used in public spaces and at airports to immediately detect the virus and contain its spread.

According to the charity Medical Detection Dogs, these dogs have been previously trained to detect diseases such as cancer, Parkinson's disease, and Malaria. Meanwhile, researchers in the US and France are also attempting to train dogs to detect the virus.

No evidence of contracting COVID from pets

Meanwhile, the U.S. Department of Agriculture and the U.S. Centers for Disease Control and Prevention stated that there is no evidence of pets spreading the Coronavirus to people. However, there have been a few cases where animals have contracted the virus from people. While a tiger at New York's Bronx Zoo had tested positive for the virus, a few cats in the US and Hong Kong have been tested positive.

The COVID-19 crisis

First detected in China's Wuhan, at present, there are around 4,890,863 confirmed cases of COVID-19 infection across the globe and the disease has led to the death of around 320,130 people. In a ray of hope, around 1,907,392 people are also reported to have recovered.

<https://www.republicworld.com/world-news/uk-news/covid-19-uk-to-conduct-606000-research-to-test-if-dogs-can-detect-c.html>