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समाचार पत्रों से चयित अंश Newspapers Clippings

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

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The Statesman

Fri, 12 June 2020

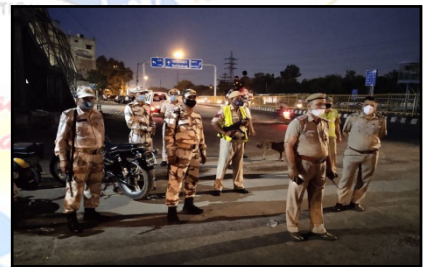
DRDO develops machine 'GermiKlean' to sanitise uniforms of security forces amid rise in Coronavirus cases

The machine is designed to sanitise 25 pairs of uniforms within 15 minutes, DRDO officials have said

New Delhi: With Prime Minister Narendra Modi having constantly batted for 'Made in India' products amidst the Coronavirus crisis, Defence Research Development Organisation (DRDO) has developed a chamber for sanitising uniforms of security forces.

This came after the Delhi Police gave their requirement for sanitising their uniforms, canes, cane shields, helmets etc.

Police personnel along with health workers have been at the frontline in the fight against the novel Coronavirus and hundreds of them have been infected while many have also succumbed to the deadly infection.



Named 'GermiKlean', the machine is deployed at the Parliament Street Police Station. It is designed to sanitise 25 pairs of uniforms within 15 minutes, said DRDO officials.

Last month, the Research Centre Imarat (RCI), a premier laboratory of DRDO based at Hyderabad, had developed an automated contactless UVC sanitising cabinet to sanitise mobile phones, iPads, laptops, currency notes, cheque leaves, challans, passbooks, and paper.

The cabinet has been named Defence Research Ultraviolet Sanitiser (DRUVS).

DRUVS Cabinet has a contactless operation which is very important to contain the spread of virus. The proximity sensor switches clubbed with drawer opening and closing mechanism makes its operation automatic and contactless.

The DRUVS provides 360 degree exposure of UVC to the objects placed inside the cabinet. Once the sanitisation is done, the system goes in sleep mode, hence the operator need not wait or stand near the device, said a statement.

RCI has also developed an automated UVC currency sanitising device called NOTESCLEAN. Bundles of currency notes can be sanitised using DRUVS, however disinfection of each currency note using it, will be a time-consuming process. For that purpose, a sanitising technique has been developed, where one has to just place the loose currency notes at the input slot of the device. It picks the notes one by one and makes them pass through a series of UVC lamps for complete disinfection, it said.

The need for such devices arise as the number of Coronavirus cases continue to rise in the country.

<https://www.thestatesman.com/india/drdo-develops-machine-germiklean-sanitise-uniforms-security-forces-amid-rise-coronavirus-cases-1502898678.html>

ताकि संक्रमित न हों पुलिसकर्मी, इसलिए

DRDO ने बनाई यह खास मशीन

DRDO के एक अधिकारी ने बताया कि इस सैनिटाइजिंग चेंबर मशीन को 'जर्मीक्लीन' नाम दिया गया है। इसे संसद मार्ग पुलिस स्टेशन में स्थापित किया है। यह मशीन 15 मिनट के भीतर 25 जोड़ी वर्दी को साफ कर सकती है।

खास बातें

- अभी मशीन को सिर्फ संसद मार्ग पुलिस स्टेशन पर इंस्टाल किया गया है
- DRDO ने इसके पहले उन्नत तकनीकी वाला वेंटिलेटर विकसित किया था। इसकी तकनीकी को वेंटिलेटर इंडस्ट्री को सौंपा गया है

नई दिल्ली: भारतीय रक्षा और अनुसंधान संगठन के आविष्कार कोरोना काल के दौर में चल रही इस लड़ाई में बड़ी सहायता कर रहे हैं। इसके जरिए देश को कोरोना से लड़ने की ताकत मिल रही है। DRDO ने ऐसा ही एक और निर्माण किया है। संगठन ने कोरोना वायरस के खिलाफ फ्रंटफुट पर लड़ाई लड़ रहे रक्षा कर्मियों के लिए एक खास तरह का सैनिटाइजिंग चैम्बर तैयार किया है।

जर्मीक्लीन दिया गया है नाम

DRDO के एक अधिकारी ने बताया कि इस सैनिटाइजिंग चेंबर मशीन को 'जर्मीक्लीन' नाम दिया गया है। इसे संसद मार्ग पुलिस स्टेशन में स्थापित किया है। यह मशीन 15 मिनट के भीतर 25 जोड़ी वर्दी को साफ कर सकती है।

अधिकारी ने बताया कि दिल्ली पुलिस की ओर से अपनी वर्दी, डंडा, शील्ड, हेलमेट आदि को संक्रमणमुक्त करने के लिए डीआरडीओ से ऐसी कोई मशीन डिजाइन करने का आग्रह किया गया था। इसके बाद उनकी आवश्यकता को देखते हुए सुरक्षा बलों की वर्दी को साफ करने के लिए यह चेंबर विकसित किया गया है।



कपड़ों पर कोरोना होने का खतरा

कोरोना के इस दौर में अन्य विभागों और कार्यक्षेत्र के लोग तो वर्क फ्रॉम होम कर सकते हैं, लेकिन पुलिस विभाग के लिए ऐसा करना नामुमकिन है। कोरोना के इस दौर में पुलिस कर्मी लंबी ड्यूटी भी कर रहे हैं। इस दौरान में कितने ही लोगों के संपर्क में आते हैं। कपड़ों पर भी कोरोना का चिपकने का खतरा रहता ही है। ऐसे में यह मशीन बनवाई गई है। अभी इस इसे सिर्फ संसद मार्ग पुलिस स्टेशन पर इंस्टाल किया गया है।

इसके पहले बनाया था वेंटिलेटर

DRDO ने इसके पहले उन्नत तकनीकी वाला वेंटिलेटर विकसित किया था। इसकी तकनीकी को वेंटिलेटर इंडस्ट्री को सौंपा गया है। डीआरडीओ के अध्यक्ष, डॉ जी सतेश रेड्डी ने बताया था कि संगठन ने सोसायटी फॉर बायोमेडिकल टेक्नोलॉजी (SBMT) के साथ एक वेंटिलेटर विकसित किया। कोरोना से लड़ाई में बेहतर स्वास्थ्य सुविधाएं उपलब्ध कराने के लिए यह वेंटिलेटर सहायक हो रहा है।

<https://zeenews.india.com/hindi/zee-hindustan/utility-news/so-that-policemen-are-not-infected-thats-why-drdo-created-this-special-machine/694458>

दिल्ली पुलिस के जवानों में कोरोना का खतरा कम करेगी मशीन, DRDO ने बनाई

दिल्ली में कोरोना का खतरा आम लोगों के साथ-साथ दिल्ली पुलिस के जवानों में भी बढ़ रहा है। इस बीच DRDO ने एक मशीन बनाई है जिसमें दिल्ली पुलिस के जवानों की वर्दी सैनिटाइज हो सकेंगी।

हाइलाइट्स

- दिल्ली पुलिस के सैंकड़ों जवान अबतक कोरोना पॉजिटिव पाए गए, कुछ की जान भी गई
- DRDO ने दिल्ली पुलिस के लिए बनाई मशीन, इसमें वर्दी-हेलमेट आदि सैनिटाइज हो सकते हैं
- फिलहाल दिल्ली के एक थाने में इसे लगाया गया है, 15 मिनट में 25 वर्दी सैनिटाइज

नई दिल्ली: कोरोना वायरस काल में दिल्ली पुलिस अपनी हर जिम्मेदारी निभा रही है। इस बीच कोरोना का खतरा उनके लिए भी बढ़ गया है। ऐसे में डीआरडीओ कोरोना वायरस के बीच व्यवस्था को ठीक रखने के लिए इयूटी कर रहे जवानों के लिए खास मशीन लेकर आई है। यह मशीन पुलिसवालों की वर्दियों के साथ-साथ बचाव के लिए इस्तेमाल होनेवाली शील्ड और हेलमेट तक सैनिटाइज कर देगी।

दरअसल, कोरोना काल में दिल्ली पुलिस के जवान लंबी इयूटी कर रहे हैं। इस दौरान में कितने ही लोगों के संपर्क में आते हैं। कपड़ों पर भी कोरोना का चिपकने का खतरा रहता ही है। ऐसे में यह मशीन बनवाई गई है। फिलहाल तो इसे सिर्फ संसद मार्ग पुलिस स्टेशन पर तैनात किया गया है।

इस मशीन को DRDO ने जर्मक्लीन नाम दिया है। यह एकसाथ 25 वर्दियों को सिर्फ 15 मिनट में सैनिटाइज कर सकती है। यह मशीन एक चेंबर जैसी है, जिसमें वर्दी के अलावा सुरक्षा वाली ढाल, हेलमेट भी सैनिटाइज किए जा सकते हैं। दिल्ली पुलिस के सैंकड़ों जवानों को अबतक इयूटी पर कोरोना हो चुका है। कुछ ने कोरोना की वजह से जान भी गंवा दी है।



कोरोना काल में तैनात दिल्ली पुलिस

<https://navbharattimes.indiatimes.com/metro/delhi/other-news/drdo-makes-germiklean-machine-for-uniforms-sanitization-of-delhi-police/articleshow/76316926.cms>

live**mint**

Fri, 12 June 2020

Coronavirus: DRDO develops chamber for sanitizing uniforms of security forces

By Deepak Upadhyay

- The DRDO said the machine, named 'GermiKlean', is designed to sanitise 25 pairs of uniforms within 15 minutes
- Over 800 Delhi police personnel have tested positive while five have so far lost their lives to coronavirus.

New Delhi: Defence Research and Development Organisation (DRDO) on Thursday said it has developed a machine for sanitizing uniforms of security forces amid rising number of coronavirus positive cases, fatalities among the security ranks.

The DRDO said the machine, named 'GermiKlean', is designed to sanitise 25 pairs of uniforms within 15 minutes.

Keeping in view that security personals are deployed at various key points like quarantine centres, private and government hospitals, containment zones to ensure law and order. And also due to the rising number of police personals turning positive for coronavirus, the Delhi police had requested the defence research organisation to develop a machine for sanitizing their uniforms, canes, cane shields, helmets etc.

Over 800 Delhi police personnel have tested positive so far while five have so far lost their lives to coronavirus.

Meanwhile, Delhi Police Commissioner SN Shrivastava said the number of COVID-19 cases are bound to increase in the force as the figure for the entire national capital increases. But he stressed that it is important that the pandemic does not affect the force's morale and also doesn't lead to fatalities.

Shrivastava said Delhi Police is taking good care of its personnel and they have been praised for being involved in humanitarian work on the ground.

"We are taking the best care of our policemen. All the policemen are feeling that they are being looked after by their seniors," he added.

To strengthen the immunity of its personnel, Delhi Police has distributed Ayurvedic medicines from AYUSH to each of the over 81,000 of them while in the second round 15,000 police personnel were given Ayurvedic medicines.

The police personnel have been strictly told to maintain social distancing among themselves and to not get exposed to unknown people at home and the work space.

<https://www.livemint.com/news/india/coronavirus-drdo-develops-chamber-for-sanitizing-uniforms-of-security-forces-11591871131452.html>



Named 'GermiKlean', the machine is deployed at Parliament Street Police Station (@Twitter)

R. REPUBLICWORLD.COM

Fri, 12 June 2020

COVID-19 Fight: DRDO's 'GermiKlean' to sanitise uniform, other gears used by Delhi police

The DRDO has made a chamber - GermiKlean - to sanitize uniforms of security forces, who are selflessly serving the nation at the time of crisis

By Madhurima Mishra

The Defence Research and Development Organisation (DRDO) has been making continuous effort to combat Covid-19. In its recent bid, it has made a chamber to sanitize uniforms of security forces, who are selflessly serving the nation at the time of crisis.

The DRDO made the product, 'germiKlean' after the Delhi Police requested for equipment which could sanitize their uniform, canes, shields, helmets among other gear. The machine was designed and developed by Defence Institute of Physiological and Allied Sciences (DIPAS), one of the Laboratories of DRDO.

Sanitizes 25 pairs in 15 mins

GermiKlean is a dry heat treatment chamber (protected under IPRs) with its Industry Partner Saveer Biotech Ltd, Greater Noida which has been



deployed at Parliament Street Police Station in the national capital. The GermiKlean chamber is designed to sanitise 25 pairs of uniforms within 15 minutes. This chamber has a working area 1875X850X1600 mm which can be used for the sanitization of cane, cane shields, helmets, or any article made of wood, steel, porcelain, plastic which can withstand a temperature of 70-80°C.

The chamber consists of a heater element and a high-efficiency blower to circulate the heated air throughout the chamber uniformly. The chamber is designed to operate using an electrical panel which comprises time and temperature adjustment. The chamber is equipped with all necessary safety features with thermostat which is present inside the panel to control the heating. The cost of "GermiKlean" is approximately Rs 2.5 Lakh.

Notably, a miniature cabinet of "GermiKleanMini" has been specially designed to sanitise papers, stationary and small articles. This unit has been placed at the dak/paper receiving section and all the papers/dak are distributed in the office after treatment in this chamber. SARS-CoV-2 is highly sensitive to temperature. The stability of SARS-CoV-2 at different temperatures has been studied and it is found to get inactivated at higher temperatures. At 70°C, the time for virus inactivation is five mins.

Therefore, dry heat treatment of articles that can withstand the temperature of 70-80°C for 15-30 min can be done against SARS-CoV-2. The measurement of chambers can be customised as per requirement. The cost of "GermiKleanMini" is approximately Rs 50 Thousand. In addition, shoe sanitiser, and contactless hand sanitiser dispensing units have also been provided by DRDO to Delhi Police.

<https://www.republicworld.com/india-news/city-news/drdo-germiklean-will-sanitise-uniform-other-equipment-used-by-del.html>

OBN

For the Community, By the Community

Fri, 12 June 2020

German clear machine will cut back the chance of corona in policemen – German clear machine will cut back the chance of corona in policemen

By Abigale Lormen के 50 वर्ष

New Delhi: Delhi Police is adopting new know-how to guard its troopers from Corona. Now the German clear machine will cut back the chance of corona in policemen. The machine, ready by DRDO, was first put in on the Parliament Street police station in New Delhi.

Uniforms and helmets will probably be sanitized on this machine. Many Delhi Police personnel have been contaminated with Corona. Five Delhi Police personnel have additionally died. Delhi Police stays in direct contact with the individuals.

Additional Deputy Commissioner of New Delhi district, Deepak Yadav mentioned that DRDO has made this machine for Delhi Police personnel. Uniform, defend and helmet will probably be sanitized on this machine made for Delhi Police.

He knowledgeable that the uniform will probably be hung within the machine and at a temperature of 70 ° C, this machine will sanitize the uniform with out washing it. The machine can concurrently sanitize 25 uniforms in 15 minutes.

Actually, Delhi Police personnel are doing lengthy obligation at the moment. In such a scenario, he is available in contact with many individuals. There is a concern of sticking the corona on the uniform too. Keeping this in thoughts, DRDO has constructed this machine.



This machine has a chamber. Luggage is hung on this. When you begin the machine, its temperature rises to 70 levels. In this case, corona an infection is eradicated. A DRDO crew will go to the Parliament Street police station on Friday to examine the machine.

<https://ourbitcoinnews.com/german-clean-machine-will-reduce-the-risk-of-corona-in-policemen-german-clean-machine-will-reduce-the-risk-of-corona-in-policemen/>



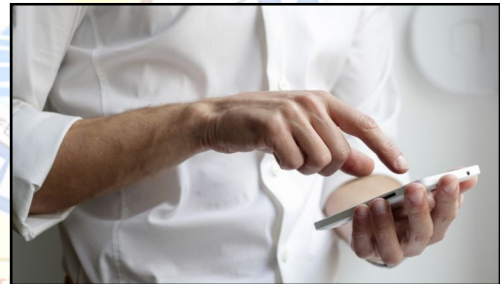
Fri, 12 June 2020

DRDO's made in India automatic sanitiser dispensing unit now comes with an app, an industry first

Oakmist app accompanies the Oakmist unit - a touchless sanitiser dispenser designed and developed by DRDO and manufactured by Riot Labz

Announcing a first of its kind innovation, Riot Labz presents an app that controls and enhances the functionalities of Oakmist – an automatic mist based hand sanitiser dispenser which was designed and developed by Defence Research and Development Organisation (DRDO). A Made in India, Made for India innovation, the Oakmist app provides direct access to the device through mobile hotspot. The user can control the sanitiser's functioning through the app and can modify features like spray and wait time. The app will also recommend spray and wait time per WHO guidelines. The app also provides an option to chat with customer care if a user faces any issues.

Shishir Gupta, CEO and founder of Riot Labz, says, "OakMist is proud to serve Indians at large in these trying times, where sanitisation is a necessary means for survival. We have launched a first of its kind Oakmist app, to help users to personalise their Oakmist unit. The app will evolve as per the user's needs and demands and will be frequently updated. OakMist app will ensure that users sanitise per the recommended guidelines and stay safe."



In a straightforward three-step process, the app gets connected to a preinstalled Oakmist unit. Once installed and opened, the app guides the user through the connection process with the sanitiser. The app provides the user with the choice between two operation modes: auto and manual. Under the auto mode of operation, Oakmkist unit sprays the sanitisation liquid as long as the hands remain under the nozzle. By choosing the manual mode, the user can control two features: Spray time and wait time. Spray time is the duration for which the unit will spray the sanitisation liquid. For places with heavy footfall, it is better to use the manual mode to conserve water and sanitisation liquid. The 5-second spray from the device showers around 5-6ml of alcohol-based sanitiser and is sufficient for proper sanitisation.

Firmware and software updates are necessary for the smooth functioning of the Oakmist unit and can be done only via the app. It is essential to download the app to get the best usage out of your Oakmist unit. Downloading the app will ensure that no office personnel needs to touch the installed Oakmist unit to make any changes to the settings. The app also has an option for the users to chat with Oakter's customer service if they require assistance regarding the use of the product. The app is live on the Google play store.

The Oakmist app will provide a further boost in the adoption of the DRDO's contactless touchless sanitiser which is already in use at locations like the Supreme Court, Rashtrapati Bhawan, the PMO, Ministry of Home Affairs, Chennai and Ahmedabad airports, etc. Company officials have informed that in recent days there has been an increase in orders by private

organisations, offices and shopping malls for the product. The Okamist App will be an excellent tool for these new adopters as it reduces the dependency on technicians to make changes to an installed unit and provides a direct chat option to the customer service in case of any issues.

<https://www.expresscomputer.in/news/drdo-made-in-india-automatic-sanitiser-dispensing-unit-now-comes-with-an-app-an-industry-first/57733/>

INDIA
TODAY

Fri, 12 June 2020

Covid19: DRDO helps Delhi Police with tech to sanitise uniforms

The Defence Research and Development Organisation (DRDO), in its continuous efforts to provide solutions for fighting/preventing Covid-19 spread, has come out with a chamber for sanitising uniforms of the protection forces

By Manjeet Singh Negi

New Delhi: The Defence Research and Development Organisation (DRDO), in its continuous efforts to provide solutions for fighting/preventing Covid-19 spread, has come out with a chamber for sanitising uniforms of the protection forces. Delhi Police had given their requirement to DRDO for sanitising their uniforms, canes, cane shields, helmets and others. Defence Institute of Physiological and Allied Sciences (DIPAS), one of the laboratories of DRDO, designed and developed a dry heat treatment chamber named 'GermiKlean' (protected under IPRs) with its industry partner Saveer Biotech Ltd, Greater Noida, which has been deployed at Parliament Street Police Station.

The GermiKlean chamber is designed to sanitise 25 pairs of uniforms within 15 minutes. This chamber has a working area 1875X850X1600 mm which can be used for the sanitization of cane, cane shields, helmets, or any article made of wood, steel, porcelain, plastic which can withstand a temperature of 70-80°C.

The chamber consists of a heater element and a high efficiency blower to circulate the heated air throughout the chamber uniformly. The chamber is designed to operate using an electrical panel which comprises time and temperature adjustment. The chamber is equipped with all necessary safety features with thermostat which is present inside the panel to control the heating.

The cost of 'GermiKlean' is approximately Rs 2.5 lakh. A miniature cabinet of 'GermiKleanMini' has been specially designed to sanitise papers/stationary/small articles. This unit has been placed at the paper receiving section and all the papers are distributed in the office after treatment in this chamber. SARS-CoV-2 is highly sensitive to temperature. The stability of SARSCoV-2 at different temperatures has been studied and it is found get inactivated at higher temperatures. At 70°C, the time for virus inactivation is 5 mins.

Therefore, dry heat treatment of articles that can withstand the temperature of 70-80°C for 15-30 min can be done against SARS-CoV-2. The measurement of chambers can be customised as per requirement. The cost of 'GermiKleanMini' is approximately Rs 50,000. In addition, shoe sanitiser, and contactless hand sanitiser dispensing units have also been provided by DRDO to Delhi Police.

<https://www.indiatoday.in/mail-today/story/covid019-drdo-helps-delhi-police-with-tech-to-sanitise-uniforms-1688120-2020-06-12>



India needs to ramp up manufacturing of ventilator components: Amitabh Kant

New Delhi: Buoyed by the promise shown by domestic ventilator makers during the COVID crisis, Niti Aayog CEO Amitabh Kant on Thursday exhorted manufacturers to further scale up capacity to emerge as a global supplier of the device and related components. Speaking at a virtual conference of ventilator manufacturers and startups to discuss pathways for supporting indigenous manufacturing of ventilators, Kant said local makers supplied 60,000 ventilators in three months. The country, he said, now needs to ramp up manufacturing of ventilator components to capture the global market.

Department for Promotion of Industry and Internal Trade (DPIIT) Secretary Guruprasad Mohapatra said India under the aegis of Make in India initiative has the potential to become a leading hub for manufacturing ventilators which are affordable and portable. He too stressed on the need to initiate a drive to capture the expanding global market for ventilators.

Defence Research and Development Organisation (DRDO) Chairman Sathish Reddy said necessary freedom and handholding have spurred innovations for high-quality and cost-effective ventilator solutions in the last three months among the startups.

While, Bharat Electronics Ltd (BEL) chairman and managing director MV Gautam said the progress made by the ventilator sector in the last few months is an example of how a facilitative environment can scale up manufacturing through Make in India initiative.

(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/india-needs-to-ramp-up-manufacturing-of-ventilator-components-amitabh-kant/1863362>

DRDO Technology News



The role of satellites in maritime domain awareness in India – Analysis

By Sirat Bhalla

Oceans are vulnerable to threats ranging from environmental destruction to terrorism which necessitates the security of maritime assets. Oceans being fluid constantly change making it impossible to track the elements of an oceanic system and here space technology proves to be of great use. The invention of satellites has enhanced the capabilities to collect and utilise the data from oceans with fair accuracy and efficiency.

India entered the space race in the 1970s and since then it has successfully launched multiple Low Earth Orbit (LEO), Medium Earth Orbit (MEO), High Earth Orbit (HEO) and Geostationary Earth Orbit (GEO) satellites.

On March 27, 2019, India acquired the capability of Anti-Satellite(ASAT) weapon after the successful implementation of the Mission Shakti program that was led by the Defence Research and Development Organisation (DRDO) and the Indian Space Research Organisation (ISRO). After shooting down Microsat-R, an Indian LEO satellite, in just three minutes, India became the fourth country with this state-of-the-art technology. However, India stands against the arms race in space with a belief that space must be used for peaceful purposes as it is the common heritage of humankind. India has said that it will militarize the space only for defensive purpose.¹



Indian anti-satellite missile, Mission Shakti. Photo Credit: DRDO

India only has one exclusive defense satellite, Rukmani, of which the Indian Navy is the user. In 2013, GSAT-7 Rukmani, a multi-band military communication satellite, was launched and was capable of monitoring Indian Ocean Region (IOR) spread across 2,000 nautical miles. This geostationary naval satellite provides real-time data to Indian Navy ships and submarines.² It performed tremendously well by providing network capabilities during the Theatre-level Readiness and Operational Exercise (TROPEX),³ and its supported Indian Naval Units involved in the search and rescue operation of the infamous Boeing 777-200 aircraft.⁴

To replace Rukmani, the Indian Navy on June 11, 2019, placed an order to ISRO for building a new GSAT-7 repeat or GSAT-7R.⁵

Maritime Domain Awareness (MDA) is crucial for maritime security as without understanding maritime domain one cannot protect it from innumerable threats. The extraction and accumulation of intelligence in real-time and ensuring that it reaches the desired destination in real-time require communication, surveillance and navigation, which are only possible using satellites.⁶ Thus the best option is to develop a space-based MDA architecture. Currently, two recent developments Automatic Identification System (AIS) and Synthetic Aperture Radar (SAR) are very important for MDA.

The initial motivation behind the development of AIS was to avoid collision between vessels, but it had limitations, for instance, the Very High Frequency (VHF) range was of just 10-20 nautical miles⁷ and ships could turn off the AIS when they didn't want to get detected and identified.⁸

Satellites were seen as the solution to these challenges as the view from space is different covering a larger area. The Satellite Automatic Identification System (S-AIS) was developed as a result. S-AIS now not only focuses on the prevention of vessel collisions, but also provides protection by alerting maritime security forces of purposeful violation occurrences of maritime boundaries. It is also being used by states to manage and control maritime traffic and helps with navigation using a special application called AIS Aids and Navigation (A to N), which further helps in search and rescue operations.⁹

When S-AIS is applied innovatively it can help authorities to identify any potential threat, which eventually aids the improvement of MDA leading to heightened security. But even S-AIS faces a challenge: serving many AIS cells simultaneously leads to a collision of messages making it difficult to decode them. This needs to be addressed possibly by using the technique based on Blind Source Separation (BSS). To enhance S-AIS system these five factors must be taken care of: (a) continuous global coverage and superior detection rates, (b) real-time downlinks, (c) ability to detect all AIS broadcasters, (d) ability to handle rapidly expanding Application Specific Messages (ASM), and (e) ability to adapt to evolving uses of the maritime VHF Spectrum.¹⁰

India doesn't have an S-AIS system of its own, but plans for it are underway. In 2019, India and France formalized around 10 LEO satellites having space-based AIS technology to monitor vessels in the Indian Ocean.¹¹ India is currently using exactEarth of Canada. Exact Earth signed a contract

in 2016 with Antrix Corporation Ltd., the commercial arm of ISRO to provide S-AIS data services to the Indian Navy.¹²

Apart from S-AIS another major requirement for MDA is of Synthetic Aperture Radar (SAR) satellites. SAR imaging sensors can work during day and night, including bad weather condition. The images that are generated can be used for applications such as ship detection, monitoring of sea ice, wave and wind retrievals, as well as interpreting surface current gradients' signatures over oceanic fronts, internal waves, and shallow water bathymetry. SAR satellites are also suitable for oil spill monitoring.¹³

SAR, though very useful, has certain limitations attached to it; the issues are related to application, data access and data dissemination. Interpretation of signal intensity and the phase difference is vital for exploring SAR data, but it demands complex processing techniques that can be automated; automation of Electro-Optical (EO) imagery is available and when used with SAR, proves to be beneficial for users. Thus, it raises the demand for SAR and Optical fusion. Since there is a plethora of data, availability does not equal accessibility — therefore defence must take steps to leverage the processing and analytics capabilities required to exploit the complex SAR data by employing enterprise computing.

India has two SAR satellites, RISAT 1 and 2, which possess submarine-detecting capability. Yet, their resolution is not sufficient and efficient enough to provide the necessary detection capabilities, particularly when compared to their Chinese counterparts. India will need a larger number of radar satellites in the coming years.¹⁴

India has been taking steps to improve its MDA. The government has plans to establish a National Maritime Authority (NMA) that will help with policy-making and coastal security coordination among the stakeholders.¹⁵ It is also focusing on the development of National Maritime Domain Awareness (NMDA) under which Indian Navy has established the National Command Control Communication Intelligence (NC3I) network that hosts Information Management and Analysis Centre (IMAC). IMAC has an Information Fusion Centre (IFC) that collects, fuses and disseminates intelligence information received from multiple sources.¹⁶ India intends to buttress the NMDA by initiating multilateral cooperation agreements.

The country has set maritime security as its foremost agenda and it's conspicuous for its involvement in defense meetings of the Indian Ocean Rim Association (IORA), East Asia Summit and ASEAN. In addition, Prime Minister Narendra Modi's recent visits to the Maldives, Seychelles and Sri Lanka had top priority given to maritime security concerns.

The National Automatic Identification system (NAIS) network has successfully been implemented in India providing it with an AIS maritime picture over the entire Indian coastline. It involves both the Indian Navy and Coast Guards.¹⁷ India, however, should extend its cover beyond IOR to the South China Sea and Western Pacific Ocean.

India needs to transform 'Make in India' and become 'Aatma Nirbhar'; while foreign defense companies are ready to collaborate with Indian ones, they are hesitant to transfer cutting-edge technology. Equally worrisome is Indian companies' atrocious capacity to acquire and absorb foreign technology.

S-AIS and SAR satellites by themselves are neither reliable nor capable in providing relevant information for MDA, therefore it is crucial to deploy multiple sources. The big data collected from these sources need fusion and decision-making support. It is true that collaboration of this data at a global level would allow the watch centres around the world to get a better understanding of what is happening in their respective area of concern and where it fits in the global picture. Collaborative Space-based Maritime Situational Awareness (C-SIGMA) is an initiative towards the accomplishment of Global Maritime Awareness.

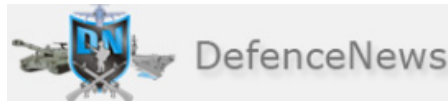
To conclude, space-based technology will not replace the terrestrial systems in the future, rather they will make the terrestrial systems more efficient. For instance, in the future instead of sending an area patrol to search, they will be sent directly to the area where the abnormal activity is known

to be occurring. Many countries are looking to space to enhance their national security by strengthening their military capabilities. Today they are developing their own space capabilities to close the knowledge gap of what is going on in the oceans.

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Fri, 12 June 2020

India plans to curb weapons imports, focus on domestic manufacturing

Under its "Aatma Nirbhar Bharat Abhiyan", the Narendra Modi government has decided to soon initiate procurement of arms and ammunition from local industries to reduce import dependence on foreign Original Equipment Manufacturers (OEMs).

This is a post Covid-19 plan of the Central government which it would implement after it gets relief in fight against the deadly virus.

The Union Home Ministry (MHA) -- which is responsible for the country's internal security -- will soon urge private industries to come forward to meet the expectations of the government so that procurement of arms and ammunition from foreign countries could be curtailed.

It is learnt that the government is open to solve the issues of the private sector by shaping them to be price competitive and focus on quality in production so as to fulfil needs of best arms and ammunition.

The plan not only envisages catering to domestic needs, but also to export Indian products abroad. This is an attempt to achieve the vision of "Aatma Nirbhar Bharat Abhiyan" as India has been for the last many years dependent on outside OEMs.

Sources said that the government started preparing a road map in this direction since it came into power, and the Arms (Amendment) Bill, 2019, bringing changes to the six-decade-old Arms Act, 1959 was passed by Parliament in December last year for this purpose.

Under the amended law, licensed private industries have been allowed to manufacture and proof test small arms and ammunition including the ones being used by the military.

Addressing a FICCI webinar, Minister of State for Home G. Kishan Reddy on Wednesday also signalled the government's plan, saying they will focus on promoting domestic manufacturing of arms, ammunition and other security products under "Make in India" to promote Aatma Nirbhar Bharat Abhiyan -- a call given by Prime Minister Narendra Modi in his May 12 address to the nation in which he talked about the pre- and post-Covid worlds. In order to fulfil the dream of making the 21st century India's century, Modi had said the way forward is through ensuring that the country becomes "self-reliant".

Noting that India was dependent on worldwide OEMs for procuring arms and ammunition for the last several years, the Minister said: "Now the government of India has decided to soon initiate procurement from local industries to reduce import dependence."

Reddy highlighted that the government is also in the process of upgrading various testing centres and labs in the country. He added that the government will also use the Government e-Marketplace portal to promote domestic products.

In this direction, India is expected to cut short the artillery list of imports this year because guns that have lately been inducted into the army such as M777 howitzers, K9 Vajra and Dhanush are being manufactured in India.

To promote indigenous defence manufacturing and reduce imports, Finance Minister Nirmala Sitharaman, last month, had announced that a list of weapons and equipment banned for import would be made in consultation with the Department of Military Affairs headed by the Chief of Defence Staff.

In a bid to boost domestic manufacturing of arms and ammunition under the government's "Make in India" initiative, the MHA in 2017 had notified new Arms rules that allow arms manufacturing licences to be valid for the lifetime of the licensee company. Prior to this notification, such licenses had to be renewed every five years.

The liberalised rules only apply to licences granted by the MHA to small arms and ammunition companies, and those granted by the Department of Industrial Policy and Promotion (DIPP), under powers delegated it, for tanks and other armoured vehicles, spacecraft, defence aircraft, warships of all kinds, arms and ammunition and allied items of defence equipment other than small arms.

There are nearly 100 firms licensed by the MHA for the manufacture of guns (single barrel/double barrel) and around 30 firms manufacturing cartridges (blank or live cartridges or both) up to the quota permitted in their licences.

Max Aerospace, Bharat Forge, L&T and Punj Lloyd are among the Indian firms who legally manufacture arms and ammunition.

<https://www.defencenews.in/article/India-plans-to-curb-weapons-imports,-focus-on-domestic-manufacturing-841065>

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DefenceNews

50 years

Fri, 12 June 2020

Chinese army gets most advanced vehicle-mounted howitzer amid

India-China border standoff in eastern Ladakh

As Indian and Chinese military commanders are busy in talks to end the border standoff in eastern Ladakh, a Global Times report has revealed that China's People's Liberation Army (PLA) 75th Group Army recently received delivery of a batch of new weapons.

These new weapons include China's most advanced vehicle-mounted howitzer, the PCL-181, as identified by Chinese military enthusiasts in photos showing the commissioning ceremony when its troops were conducting exercises in northwestern China amid border tensions with India, according to Global Times, which cited the official WeChat public account of the 75th Group Army.



A brigade under the PLA 75th Group Army is reported to have held a commissioning ceremony of new weapons and equipment during field exercises in northwestern China's desert areas, Nanjiang Haojiao, or Horn of the Southern Border. The official statement released on Tuesday also attached photos of several PCL-181 vehicle-mounted howitzers.

The public debut of this type of 155-millimeter caliber wheeled howitzer was done during the National Day military parade in Beijing on October 1, 2019. China Central Television (CCTV) reported that the new weapon weighs only 25 tons, making it much lighter and faster and with longer endurance than the previous self-propelled howitzer, which uses crawler tracks and weighs more than 40 tons.

The lightweight weapon reportedly has an edge in high altitude areas when the lack of oxygen could impact the power of the engine. It would also have digitalized control panels in the

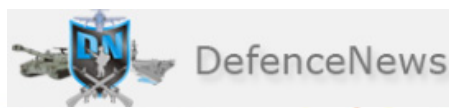
howitzer's cab, and this system would allow artillery gun deployment with the press of a button, automatic gun calibration and semi-automatic ammo reload.

The PCL-181s were dispatched to the PLA Western Theater Command during the Doklam standoff with India in 2017, and contributed to the safeguarding of peace at the border, said the report citing Shanghai-based news website eastday.com. The new weapon was reportedly commissioned before the positive border talks between China and India on Saturday.

Notably, China and India are "properly handling" and taking actions to ease the situation at the border based on the "consensus" reached recently during their diplomatic and military level talks, a PTI report quoting senior Chinese official said on Thursday.

The Chinese Foreign Ministry spokesperson's remarks reportedly came a day after the Indian and Chinese military commanders held "productive" talks to end the border standoff in eastern Ladakh.

<https://www.defencenews.in/article/Chinese-army-gets-most-advanced-vehicle-mounted-howitzer-amid-India-China-border-standoff-in-eastern-Ladakh-841063>



Fri, 12 June 2020

Helicopters land heavy equipment to expedite work of strategic road near India-China border: BRO

Helicopters have landed heavy road-building machinery in the tough Himalayan terrain of Uttarakhand's Johar Valley to help speed up construction of the strategic Munsiyari-Bugdiyar-Milam road near the India-China border, an official said.

After several failed attempts in 2019, the Border Roads Organisation (BRO) recently succeeded in carrying heavy road building equipment by helicopters to Laspa, raising hopes of the road's faster completion, BRO chief engineer Bimal Goswami said.

The absence of heavy stone cutting equipment at Laspa near the alignment site of the 65-km road had delayed its construction.



The Munsiyari-Bogdiyar- Milam road, which is being constructed in the high Himalayan region of Johar Valley in the state's Pithoragarh district, will be a link to the last posts on the Indo-China border.

“After several unsuccessful attempts last year, we succeeded this month in landing helicopters carrying heavy machines to Laspa. We now hope that cutting work of the challenging stretch will be completed in the next three years, Goswami said.

Cutting of hard rocks, which are standing straight on a 22-km portion of the road, will now become easy as heavy machines can be transported by helicopters to the spot.

“Construction of the road was started in 2010 with an amount of Rs 325 crore sanctioned for the project, the BRO chief engineer said.

He said the road is being constructed from both ends and except the 22-km hard portion, cutting work has been completed on 40 km of the road.

<https://www.defencenews.in/article/Helicopters-land-heavy-equipment-to-expedite-work-of-strategic-road-near-India-China-border-BRO-841056>

Indo-China LAC Standoff: Still a long way to go, say experts

The talks between GOC (General Officer Commanding), 3 Division, and his Chinese counterpart came close on the heels of both sides carrying out ‘small disengagement’ indifferent locations along the LAC as part of the confidence-building measures

By Huma Siddiqui

On Wednesday, the meeting took place between the Divisional Commander’s of the Indian Army and the People’s Liberation Army of China at Patrolling Point 14; a point of dispute. The focus of the talks was resolving the month-long standoff along the Line of Actual Control in Eastern Ladakh. “As things stand today, the only positive of the division commander level talks held on Wednesday at Galwan Valley seems to be that both sides are at least talking to each other,” say experts.

The talks between GOC (General Officer Commanding), 3 Division, and his Chinese counterpart came close on the heels of both sides carrying out “small disengagement” indifferent locations along the LAC as part of the confidence-building measures.



In the background of current developments, India would need to introspect the meaning of Chinese assurances and confidence-building measures all along its long borders. (File nphoto: PTI)

What do Military experts say?

The cordial meeting and its outcome were along the expected lines. The Indian side has asked the Chinese to pull back the 6000 additional troops that were brought in, apparently, the right noises must have been made, the intent of a pullback is not known. “In the background of current developments, India would need to introspect the meaning of Chinese assurances and confidence-building measures all along its long borders,” urge experts.

According to Lt Col Manoj K Channan (Retd), “A few questions that are not being spoken about in the Indian Media is, what is the current Chinese deployment Vis a Vis pre-May 2020 deployment. If the PLA has made ingress into an area, not defined due to ‘perception issues’; then why have we agreed to pull back? In 1999 and now we deviated from standard practices of forward deployment; is this not something that needs to be introspected? In view of no clear rules of engagement Indian Army and PLA are unique in the World, who carry signboards to indicate that LAC violation has taken place; why be so servile, historically an aggressive stance has kept the PLA at bay, this has eroded over the years, enough examples are on Social Media quoting Gen Sagat and Gen Hanut. In 1999, Cdr 121(I) Infantry Brigade was removed from Command; who is the scapegoat this time will unravel with time as will the Chinese intentions”.

“A major point of concern remains that we are focussed on what is visible in front of us in the areas of dispute. Strategic Analysts have put in print media their assessments of long term plans in the Aksai region, their military presence in Pakistan; and Pakistan in no position to disallow its all-weather friend to do a Military build-up on the Western Flank of India,” Lt Col Channan opines.

“The conflict is real. It’s time to look the dragon in the eye if need be hit his snout and his family jewels, we are prepared and have nothing to be afraid of. It’s a political decision, let’s go beyond the political rhetoric which we hear daily on the news channels,” he concludes.

Sharing his views Brig NK Bhatia (retd) says, “First and foremost we need to explore and pin point the reasons for China to have done what it has done. India seemed to have reconciled to the idea of peaceful co-existence after so-called meaningful and fruitful talks with Chinese leadership

in the spirit of Wuhan and Mallapuram bilateral engagements at the highest levels after having overcome the Doklum standoff.”

In the background of current developments, India would need to introspect the meaning of Chinese assurances and confidence-building measures all along its long borders.

“The second important issue that India would need to grapple would be plans for continued enhanced deployment of troops and heavy equipment in high altitude terrain on a continuing basis even at the height of treacherous weather conditions of winter months. With curtailed defence spending and restructuring of manpower, that would put additional strains on limited resources available to the armed forces,” Brig Bhatia opines.

In Brig Bhatia’s view “The violation of borders by China has generated a groundswell of animosity amongst people across all spectrums of society. That will only force a common Indian to rethink about anything Chinese. In the context of an overall bleak economic scenario that would only exacerbate the economic situation.”

“Eventually the two sides will disengage but that will require a series of hard negotiations and some give and take, both at the military as well as diplomatic levels and that in some way may alter the ground situation as well. This will surely lead to some heartburns and political slugfest as well,” he says.

Adding, “We will continue to discuss the geopolitical reasons and global ramifications of Chinese actions for days to come but the seeds of mistrust between the two global giants would take years to mend.”

What happened during talks on Wednesday?

According to sources the Div Commander level talks took place as per the schedule and lasted for almost four hours.

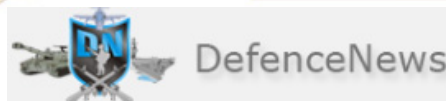
The two sides took forward the discussions which happened last Saturday.

Several more rounds of both military, as well as diplomatic level talks, are expected to take place over the new few days.

While the Indian side has demanded that the Chinese side maintain the status quo along the LAC as of April, Pangong Lake remains a matter of contention.

What India is seeking is that the Chinese troops build-up along the LAC in the Galwan Valley is pulled away. Also, they should move away from the Hot Spring Area and the Finger 4 area of the Pangong Lake.

<https://www.financialexpress.com/defence/indo-china-lac-standoff-still-a-long-way-to-go-say-experts/1988504/>



Fri, 12 June 2020

LAC row | China reaches accord with India

China said on Wednesday it had “reached agreement” with India on the ongoing tensions along the Line of Actual Control (LAC), a day after India announced troops from both sides had begun a “partial disengagement” from some of the stand-off points.

The Chinese Foreign Ministry said both sides had agreed to handle the situation “properly” and “in line with the agreement” to ease the situation, but did not provide specific details on some of the stand-off points, such as Pangong Lake, where Chinese troops are still present on India’s side of the LAC.

Also on Wednesday, India and China held Major General-level talks to discuss further de-escalation at several standoff points in Eastern Ladakh including Patrolling Point (PP) 14, following a broad accord reached on Saturday in talks held at the Corps Commander-level. As per

the agreement, a series of ground-level talks would be held over the next 10 days, with four other points of conflict identified at PP15, PP17, Chushul and the north bank of Pangong Lake.

The Chinese Foreign Ministry did not provide specifics on the sites of conflict. It only referred to the western section, which was the focus of Saturday's talks, although a stand-off is also continuing at Naku La in Sikkim in the eastern section.

'Taking action'

"Through diplomatic and military channels, China and India have recently had effective communication and reached agreement on properly handling the situation in the west section of the China-India boundary," spokesperson Hua Chunying said. "At present, the two sides are taking actions in line with the agreement to ameliorate the border situation."

Government officials said a partial disengagement had happened at some points in the Galwan area and at Hot Springs, but there was no change at Pangong Lake.

The Global Times, a Communist Party-run newspaper, reported on Tuesday that the ongoing dispute "will not escalate into a conflict" but added "due to the complexity of the situation, the military stand-off could continue for a little longer".

The military-level talks showed "both sides do not want to escalate," Qian Feng, director of the research department of the National Strategy Institute at Tsinghua University in Beijing, was quoted as having said.

"It showed that China and India remain determined to peacefully resolve border issues," Mr. Qian Feng said. "That being said, the ongoing stand-off is not likely to end immediately, as concrete issues must still be resolved."

The Indian delegation at Wednesday's military-level talks was led by the General Officer Commanding, 3 Corps based in Karu.

Last Saturday, the two sides held talks at the level of Corps Commanders on the Chinese side at Moldo opposite Chushul, where the two sides agreed to partial pullout of troops and equipment from some of the stand-off areas in Galwan.

The talks on Wednesday is the first of several at the rank of Colonel, Brigadier and Major General.

Finger 4 area in Pangong Lake remains a major area of contention where Chinese troops had taken position in Indian territory and that is expected to be discussed at the Corps Commander level at a later stage, officials, who spoke on condition of anonymity, said.

<https://www.defencenews.in/article/LAC-row-|-China-reaches-accord-with-India-841046>



Fri, 12 June 2020

Security situation along Chinese border not good, says Indian Navy Chief

Throughout April, India and Pakistan were engaged in relentless cross-border firing, resulting in casualties on both sides of the border. Come May and the border standoff with China has grabbed headlines across the globe.

Indian Navy Chief Admiral Karambir Singh has once again reiterated India's preparedness to deal with any challenge, while the tensions along the borders with China and Pakistan remain serious.

"Our optempo of ships, submarines, and air squadrons is in place. There is no let up. We are ready to deal with any challenge. It is important because security situation along the Western and

Northern borders is not good”, Navy Chief Singh said in a recorded message to naval personnel. Indian media reports suggested that both sides have agreed to disengage troops along the Line of Actual Control. On Wednesday, the Chinese Foreign Ministry spokesperson said: “China and India have been effectively communicating via diplomatic and military channels over issues concerning the western sector of the China-India border, during which a positive consensus has been reached”.

However, military commanders from both sides are still involved in talks as the troops are still in position in the Galwan Valley and Pangong Tso.

<https://www.defenceaviationpost.com/2020/06/security-situation-along-chinese-border-not-good-says-indian-navy-chief/>

WWW.ECONOMICTIMES.COM
THE ECONOMIC TIMES

Fri, 12 June 2020

Operational tempo of warships, submarines maintained despite COVID-19: Navy Chief

Indian Navy Chief Admiral Karambir Singh, in a video message to navy personnel on the future actions for COVID-19 earlier this week, said that the force's operational teams have been constantly working amid the pandemic

By Shaurya Karanbir Gurung

New Delhi: Indian Navy Chief Admiral Karambir Singh has said that the operational tempo of the force's warships, submarines and aircraft squadrons has been maintained despite the COVID-19 pandemic and it is ready to face any situation. He said that this readiness is necessary due to the deteriorating security situation along India's borders with China and Pakistan.

Singh, in a video message to navy personnel on the future actions for COVID-19 earlier this week, said that the force's operational teams have been constantly working amid the pandemic. “Our operational tempo of ships, submarines and aircraft squadrons has been continuing. There is no let up and we are ready to deal with any challenge. We have to be ready and it is relevant, because our security situation along our western and northern borders is not good,” he said.

Speaking about the navy's “float crew”, the Navy Chief said that they have been deployed for a long time, been in quarantine and stayed away from their families. “Some ships have been sailing for 100 days at a stretch,” he said.

While giving instructions on what needs to be done ahead amid the pandemic, he said that a different approach and mindset will have to be adopted under unlock 1.0, following the nation-wide lockdown. “We have to adopt good practises. That must become our priority,” he said.

He gave an example of INS Vishwakarma, a naval shipwright school based in Visakhapatnam, which has divided its trainees and personnel into three groups. Members of one group don't interact with those of other groups. He said this has been done to avoid a contagion in the base, even if one person is infected. “This is a best practise that we can adopt in other bases,” he said.

Singh also said that another measure being implemented is that any personnel above 50 years of age and having low morbidity will not be kept in risky tasks such as in sea-going units.

“Unlock doesn't mean that we face this challenge by being complacent. We can't do that. The collective efforts that we have taken at our units have to be supplemented with individual self-discipline by wearing masks, maintaining social distance and protecting our elders and children...It cannot be business as usual,” he said.



Indian Navy Chief Admiral Karambir Singh

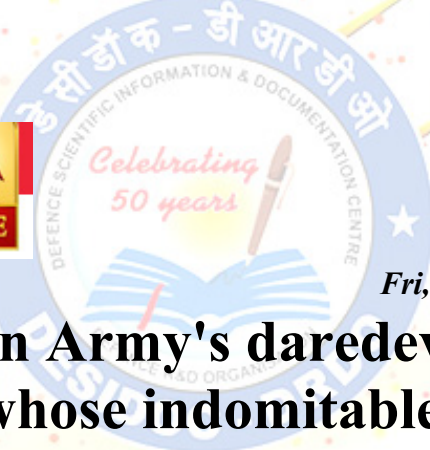
Singh also told his personnel to be “flexible” to face any uncertainties. “During this time, there will be a lot of strain on our administrative support,” he said.

The navy is focussed on securing its personnel at a time when it is operationally deployed across the Indian Ocean Region (IOR). Under its Operation Samudra Setu, as part of Mission Vande Bharat, to repatriate stranded Indians from abroad, the navy has brought back over 1,500 people from Maldives and 700 citizens from Sri Lanka. Singh said the navy is ready for further repatriation with its Landing Ship, Tank (LST). “These evacuations are different from normal combatant operations. It is more dangerous, as a contagion on the ship could happen due to an infected person. To prevent this, a high degree of preparations and precautions had to be taken by the ship teams. They have done this safely,” he said.

INS Kesari has also been deployed to provide medical aid to Madagascar, Maldives, Mauritius and Seychelles. The Navy Chief said that the force has helped the Philippines, whose ships were deployed in the IOR. “They had asked for help of repatriation of citizens from Indian ports, medical support to its troops and southern naval command had made essential repairs of their ships, which are on the way to the Philippines,” he said.

Deployments in the Gulf of Oman and anti-piracy duties in the Gulf of Aden to keep Indian merchant vessels safe are continuing as well.

<https://economictimes.indiatimes.com/news/defence/operational-tempo-of-warships-submarines-maintained-despite-covid-19-readiness-necessary-due-to-deteriorating-security-situation-along-pakistan-china-borders-navy-chief/articleshow/76324812.cms>



Fri, 12 June 2020

Gorkha Rifles: Indian Army's daredevil infantry regiment whose indomitable valour and courage in battlefield is unparalleled

The regiments of the Gorkhas Rifles collectively and more popularly known as the 'Gorkha Brigade', form a pivotal element of the Infantry (Combat Arm) of the Indian Army. Approximately 45000 Gurkhas serve in 40-odd battalions spread across 7 Gurkha Rifles regiments and other arms of the Indian Army

By Gautam Lalotra

The long standing and deep ties between sub continent neighbours India and Nepal took a bit of an ugly turn as the nations were engaged in a stand-off over a border dispute which got triggered off on account of certain strategically located Indian occupied areas like Lipulekh Pass and Kalapani being claimed by the Nepalese govt via release of new maps.

It is a well known fact all over the world that India and Nepal share very strong and deep historic and cultural ties which date back to not years but centuries. The deepest ties between the two sub continent neighbours have been fostered via a long lasting military bond where much famed Gurkha troops of Nepalese domicile, known for their bravery and courage, have served in the Indian Army and made significant contributions in the nation's victories over its adversaries in the wars fought over seven decades since independence.

In this backdrop, it becomes imperative for each Indian citizen to understand the deep ties between India and Nepal and how the valiant Gurkhas troops from Nepal have done yeoman service to Indian Army with their exceptional track record in both field and peace.

A General Background

Gorkha Rifles - One of Indian Army's Highly Acclaimed and Decorated Infantry Regiments

The regiments of the *Gorkhas Rifles* collectively and more popularly known as the '*Gorkha Brigade*', form a pivotal element of the Infantry (Combat Arm) of the Indian Army. Approximately 45000 Gurkhas serve in 40-odd battalions spread across 7 Gurkha Rifles regiments and other arms of the Indian Army.

The brave Gurkha soldiers have etched their names in the golden annals of Indian Army with almost all their regiments actively taking part in all of India's wars post independence, namely the Indo-Pak 1965 and 1971 Wars, 1962 Indo-China Conflict, 1999 Kargil War and peace keeping missions in Sri Lanka.

The Gurkha battalions showcased their undeterred spirit, Indomitable courage and valour at various battles, which earned them numerous battle and theatre honours - Gurais, Bilafond La, Shingo, Phillora, Dera Baba Nanak, Kargil, Bogra, Battalika to name a few ..

So here is a brief into the history of the Gorkha Rifles and their notable achievements

Boys from the hills of Nepal who are trained, polished and refined by armies to become the consummate soldier ..*Gurkhas*.. The mere mention of the name Gurkhas / Gorkhas sends down chills in the spines of those who have fought them or faced them in various battle fronts all through the course of military warfare..

The bravado and valiance of the Gurkhas has become somewhat a folklore and finds a noteworthy place in military history. There could not be a more fearsome sight on the battlefield when the steadfast Gurkhas ferociously charging with their Khukris, curved blade knives, unleash sheer carnage into enemy territory slashing the throats of the enemies. The brave tales of the Gurkha soldier are stuff of legends and have earned them the title of the *Bravest of the Brave*. The regimental Motto of most of the Gurkha Rifles (GR) regiments say it all -***Kayar Hunu Banda Marna Ramro (It Is Better To Die In War Than Live Like A Coward)***

Perhaps there isn't a better way to describe the valour and courage of the Gurkhas which came from none other than one of the finest ever military commanders, Field Marshal Sam Manekshaw, who had the privilege of serving with the Gurkhas during his stellar military career "***If anyone tells you he is never afraid, he is a liar or he is a Gurkha.***" - **Field Marshal Sam Manekshaw.**

Born and raised amid the lofty mountain ranges of the Himalayan region in Nepal and India, the rugged terrain and the harsh climatic conditions of the highlands make the Gurkhas naturally adept to enduring all odds to survive till the very last bullet is fired in the battlefield. Stockily built with tremendous endurance and physical prowess, Gurkhas are tailor-made to excel as a lethal combat soldier. **The Anglo Gurkha Wars And Raising Of Gurkha Rifles By The Britishers**

The British fought against the Gurkhas in the ***Anglo Gurkha Wars*** (Nov, 1814 – Mar, 1816), and though victorious, it left them impressed with the sheer resistance and tenacity of the fierce hillmen under their iconic military commander General Amar Bahadur Thapa. Much lesser in numbers, the Gurkhas inflicted some heavy damages on a much more formidable British Army, giving an exhibiting of their bravery.

While the East India Company who were on an expansion mode, faced adversaries like the Sikhs, Afghans, Jats and Marathas, they envisaged a game changing strategy to recruit the ferocious Gurkhas into their army, thus marking the beginning and formation of the much famed Gurkha Rifles regiments. In 1815, The first battalion of the Gurkha Rifles regiment more popularly known as the '*Nasiri regiment*' (later become *1st Gorkha Rifles*) was raised.

The Gurkhas went onto become the most trusted, dependable fighting force spearheading successful campaigns in the Gurkha-Sikh War, Anglo-Sikh wars, Afghan wars and Indian's rebellion in 1857.

During the World Wars, the Gurkhas turned the tide of various battles fighting for the Commonwealth Armies, deep entrenched into the deadliest of battles in Falkland Islands, Africa, Cyprus, Mesopotamia, Rangoon to name a few .

Fighting under the British flag, Gurkha regiment showcased exemplary bravery during the World Wars, earning 26 Victoria Crosses (the highest war time gallantry award accorded by the erstwhile British forces), the highest by any regiments under the British fold.

The Tripartite Agreement Between India, Nepal and United Kingdom In 1947- Re-organisation and Formation of Gurkha Regiments Serving In Indian Army Post Independence

When India's independence took place in 1947, a major decision had to be made with regards to the Gurkha regiments serving in the erstwhile British Army. So a Tripartite agreement was signed between India, United Kingdom and Nepal; resulting in the original ten Gurkha regiments being split between the British Army and the newly independent Indian Army.

Out of the 10 Gurkha Rifles regiments, four were transferred to the British Army and six formed part of the post independence Indian army. The regiments to join the British Army were 2 GR, 6 GR, 7 GR, and 10 GR.

The regiments which were transferred to Indian Army were 1 GR, 3 GR, 4 GR , 5 GR, 8 GR, 9 GR. Another Gorkha Rifles regiment was raised post independence from the volunteers (non-optees_ who did not wish to serve with the British Army, thereby raising the 11th Gorkha Rifles (11 GR). (**GR - Military Abbreviation In Short For Gorkha Rifles*)

Gorkha Rifles Have Won Three Param Vir Chakras

The Gorkha Rifles has the proud distinction of winning three Param Vir Chakras (PVC) with Captain GS Salaria (3/1 GR) posthumously, Subedar Major Dhan Singh Thapa (3/8 GR), Captain Manoj Kumar Pandey (1/11 GR, posthumously) being the proud recipients of the nation's highest gallantry award.

Gorkha Rifles Have The Unique Distinction of Producing Three Army Chiefs And One Field Marshal

The Gorkha Rifles have the honour of producing three Indian Army Chiefs. Former Army Chiefs - General SHFJ Manekshaw (Originally 12th Frontier Force Regiment later transferred to 8 GR), General Dalbir Singh (4/5 GR) and General Bipin Rawat (5/11 GR) were all commissioned into the Gurkha Rifles.

The 8th Gorkha Rifles has the unique distinction of producing one of the two Field Marshals of the Indian Army, Field Marshal Sam 'Bahadur' Manekshaw.

General Bipin Rawat Appointed As Indian Army's First Chief Of Defence Staff

The Gorkha Rifles added another path breaking chapter in their glorious regimental history when General Bipin Rawat (Belongs To 5/11 Gorkha Rifles), was appointed as the first ever Chief of Defence Staff (CDS) of the Indian Army.

(Note: The article is based on the writer's opinion and research on the topic, it has no bearing whatsoever with the organisation's view and stand on the subject.)

<https://news.abplive.com/news/india/know-about-gorkha-rifles-one-of-indian-armys-high-acclaimed-and-decorated-infantry-regiments-1257739>



Thu, 11 June 2020

Australia, India join forces in a flex at China

China has drawn Australia into its security tensions with India after New Delhi and Canberra signed a defense accord that could see their two military forces sharing facilities in sea straits hotly contested by Beijing. As China and India mobilize more troops and equipment along their fractious Himalayan border, the Chinese Communist Party-backed Global Times said that Beijing could view the India-Australia accord as a direct threat.

“Some analysts regard this move as a joint effort between India and Australia to counter China,” the newspaper’s website said in an article that carried the headline “Will Aussie, India coordinate to confront China?” “An enhanced partnership between Australia and India, especially in terms of military cooperation, will bring about a new change in the strategic pattern of the entire Indo-Pacific region,” the article warned.



First floated during bilateral talks in December, the military accord was quietly initialed this week after a virtual summit between Indian Prime Minister Narendra Modi and his Australian counterpart Scott Morrison that lifted ties to the level of a Comprehensive Strategic Partnership (CSP).

Formally known as the Mutual Logistics Support Arrangement, the accord will improve the interoperability of the two sides’ respective military forces to allow for more engagement. A Defense Science and Technology Implementing Arrangement, meanwhile, will boost cooperation between their research organizations.

This is India’s fifth CSP collaboration in the region, following on similar deals with the US, Japan, Indonesia and Vietnam. It is thus perhaps unsurprising that China views the expanding network of maritime partners as potential encirclement.

With the agreement, Australia is now more firmly the fourth pivot in a long-mooted quadrilateral security arrangement, often referred to as the “Quad”, with the US, Japan and India.

The arrangement, first initiated as the Quadrilateral Security Dialogue in 2007, had previously been put on ice by New Delhi because it was reluctant to upset China. That view has apparently changed after a second Himalayan border standoff in recent years.

India has separately courted Vietnam and the Philippines, Southeast Asian states which oppose China’s military settlements on contested South China Sea atolls and features. It is now likely that Canberra will be invited to send vessels to Malabar, a naval exercise involving India, the US and Japan that China views as a hostile act. There will be a reciprocal arrangement for Australian exercises.

The two sides have engaged in at least three iterations of AUSINDEX joint naval exercises, beginning in 2015. Exercises held in April 2019 in India’s Visakhapatnam saw Australia send a landing helicopter dock, frigates, a conventional submarine and a Durance-class multi-product replenishment oiler.

The detail attracting the most attention in the India-Australian security pact is an agreement on reciprocal access to logistics facilities — in effect, the joint use of military bases — which may include cooperative supply lines. The focus seems to be on maritime security, but it may involve air forces as well.

Initial collaboration would probably center on the islands of Andaman and Nicobar (India) and Cocos (Australia), which border some of Asia's most vital trade routes.

Andaman and Nicobar are near the Strait of Malacca, used by thousands of ships traversing between the Pacific and Indian oceans; the Cocos islands are close to the Lombok and Sunda straits.

Both nations are battling to maintain constant surveillance of the waters, which have recently attracted unprecedented attention from China. India has reported increased activity by Chinese submarines and surface ships, while Australia has been monitoring oceanographic surveys conducted by Beijing.

"In the current geopolitical competition in the Indo-Pacific, these islands can provide advantages for strategic, practical, and signaling purposes," said Indian academic Darshana Baruah, who is involved in a two-year study of Indian Ocean strategy by Australia's National Security College.

"Access to these islands will not only strengthen Australia's interests in the eastern Indian Ocean but will also provide a platform to increase its military engagements to the rest of the Indian Ocean – a challenge in Australia's Indian Ocean policy.

"Similarly, India stands to gain strategically with access to Cocos islands, expanding its reach and presence into Southeast Indian Ocean across the Indonesian straits and into the Pacific," he said.

Both Australia and India already operate maritime surveillance using P-8 Poseidon aircraft, but mostly from bases on their respective mainlands. Australia also has access to an airbase at Butterworth under a deal with Malaysia.

At the maritime level, there is a potential for joint anti-submarine patrols and cooperation in humanitarian responses and anti-piracy operations. One model for the collaboration could be the joint patrols operated by India and France over the western and southwest Indian Ocean from France's Reunion island.

A potential sticking point is how the deal is viewed in Indonesia, which would have to agree to any overflights of its territory. India signed a defense cooperation pact with Indonesia as part of their Comprehensive Strategic Partnership but it's not immediately clear it covers overflights.

Indonesia's brittle relationship with China deteriorated in late December when dozens of Chinese fishing and coastguard ships entered its exclusive economic zone (EEZ) off the northern islands of Natuna and remained in place for weeks.

China has territorial claims on the islands, as do Vietnam and Malaysia. China's ambivalent reaction suggests that it views any enhanced security arrangement between India and Australia as a containment measure, with Global Times noting India "may hope to shape more pressure toward China from the international community — in particular from the West."

"Their common interests in dealing with rifts with China do play a role in urging the two countries to coordinate strategically, which deserves China's vigilance," it said, warning this would "shape a confrontational atmosphere in the region, jeopardizing peace and stability."

<https://idr.org/australia-india-join-forces-in-a-flex-at-china/#more-228956>

Fri, 12 June 2020

Russia to receive three regiments of S-400 Missile Systems by 2023

The Russian military will receive three regiments of the S-400 'Triumpf' anti-aircraft missile systems along with four sets of the S-350 'Vityaz' battlefield air defense launchers by 2023 under new contracts with the Almaz-Antey defense manufacturer Russian state media reported on Tuesday.

The S-350 'Vityaz' surface-to-air missile system was also been developed by the Almaz-Antey defense manufacturer for battlefield air defense and is capable of striking targets within a maximum radius of sixty kilometers and at a maximum altitude of thirty kilometers. The S-350 is designated to fight both aerodynamic and ballistic targets. An S-350 launcher carries twelve surface-to-air missiles.



The Russia-built S-400 Triumpf (NATO reporting name: SA-21 Growler) is the latest long-and medium-range surface-to-air missile system and it is designed to destroy aircraft, cruise and ballistic missiles, and can also be used against ground installations. The S-400 is designed to engage targets at a distance of up to four hundred kilometers and at an altitude of up to thirty kilometers under intensive enemy fire and jamming. It entered service in 2007.

The S-400 is also being widely exported—much to the chagrin of the United States and NATO. The United States has even imposed economic sanctions on countries simply for buying the system, but many of the world's powers have still expressed interest in it. The use of the S-400 as an economic warfare tool should not be underestimated as the platform is an example of Russian Hybrid Warfare against the United States and NATO.

India is among the latest countries to sign a deal with Moscow to acquire the platform. Last month, New Delhi agreed to a \$5 billion deal to buy five units of the air defense missile system, and this follows Saudi Arabia's agreement to purchase the system earlier this year.

Turkey's purchase of the system has also put a strain on its relationship with the United States, but this week Ankara and Moscow continued negotiations on further implementing the contract on the delivery of S-400 air defense missile systems, Tass reported. Turkey is the first NATO member state to purchase the air defense missile systems from Russia, which announced in September 2017 that it had signed a \$2.5 billion deal with the NATO member. Deliveries of S-400 launchers to Turkey began on July 12, 2019.

While the export of the platform has been seen as worrisome—both for how it generated income for Moscow but also in the international prestige that Russia has gained for developing an advanced offensive and defensive weapon system—but also in how it can be employed.

The S-400 is a significant improvement over the S-300, and while the predecessor system was explicitly designed as a long-range air defense system; the S-400 is currently compatible with four missiles. Those can satisfy a wide spectrum of operational categories including the long-range 40N6E (400 kilometers), long-range 48N6 (250 kilometers), medium-range 9M96e2 (120 kilometers) and short-range 9m96e (40 kilometers).

As a result of this most recent deal, in the coming years, Russia will have three more regiments of the platform to contend with!

<https://www.defencenews.in/article/Russia-to-Receive-Three-Regiments-of-S-400-Missile-Systems-by-2023-841049>

ISRO Gaganyaan unmanned test flights unlikely this year

By Sharmishte Datti

It looks like the ISRO Gaganyaan mission will have a slight delay. As part of the Gaganyaan mission, ISRO was supposed to launch the first trial flight in December 2020. However, the ambitious human space flight program is facing some delay due to the COVID-19 pandemic and the induced lockdown.

ISRO Gaganyaan Test Flight Delay

Going into the details, ISRO had planned two trial flights without the crew, ahead of the actual manned mission in 2022. The first trial round was scheduled to liftoff around December 2020 and the second in July 2021.

"...there are some disturbances because of COVID-19, but still nothing is confirmed (about the delay). We need to see, still, we have got six months. We are trying to see if we can reach there," a senior ISRO official told PTI.

From the looks of it, ISRO is hinting there might be a slight change in the timetable. "There may be a slight up and down (in the schedule), but that will be known only when we do the complete evaluation..." the official added. For now, it's too early to say anything as the team working on the Gaganyaan mission hasn't confirmed the delay yet.

It should be noted that as part of the first trial, ISRO plans to carry the humanoid Vyommitra. ISRO has designed Vyommitra to simulate most of the human body functions for the first unmanned Gaganyaan mission. As a half humanoid, Vyommitra doesn't have legs but is equipped to carry out all the functions.

ISRO Gaganyaan Mission

The ISRO Gaganyaan mission, with a budget of Rs. 10,000 crores, is expected to liftoff in 2022. This would also mark the 75th anniversary of India's Independence. ISRO is receiving help from various international space agencies including France's National Center for Space Studies (CNES) and Russia's Gagarin Research & Test Cosmonaut Training Center. CNES is also helping India with its space station program.

Presently, four Indian Air Force pilots have been handpicked as potential candidates for the Gaganyaan mission, who are undergoing training in Russia. The COVID-19 pandemic had temporarily paused their training for a while. But recent reports have confirmed that the candidates have resumed their astronaut training.

<https://www.gizbot.com/news/isro-gaganyaan-test-flights-unlikely-this-year-068230.html>



First trial flight of Gaganyaan may face some delay due to lockdown: ISRO

Bengaluru-headquartered ISRO (Indian Space Research Organisation) had earlier said it has planned two trial flights without crew ahead of Gaganyaan -- the first one around December 2020 and the second around July 2021

Bengaluru: India's first unmanned mission slated this year as part of its ambitious human space flight venture "Gaganyaan" may face some delay with preparations adversely impacted due to the Covid-19-induced lockdown, according to ISRO officials.

Bengaluru-headquartered ISRO (Indian Space Research Organisation) had earlier said it has planned two trial flights without crew ahead of Gaganyaan -- the first one around December 2020 and the second around July 2021.

"...there are some disturbances because of Covid, but still nothing is confirmed (about delay). We need to see, still we have got some six months time. We are trying to see if we can reach there," a senior ISRO official told PTI.

He added: "There may be slight up and down (in the schedule), but that will be known only when we do the complete evaluation...it is premature to say anything, because the team that is working (on the project) has not indicated (about delay)." ISRO plans to carry humanoid "Vyommitra" in the first test flight.

The space agency is expected to launch the Rs 10,000- crore "Gaganyaan" in 2022, the year of the 75th anniversary of India's Independence.

Four Indian Air Force fighter pilots -- potential candidates for the Gaganyaan project -- are currently under training in Moscow.

<https://www.hindustantimes.com/india-news/first-trial-flight-of-gaganyaan-may-face-some-delay-due-to-lockdown-isro/story-7z8WzF5jPTDHxBiZmShU2N.html>



DECCAN
Chronicle

Soon, private sector can use ISRO facilities to ensure level playing field

Future projects for planetary exploration and outer space travel will also be opened for private sector

New Delhi: The Centre will allow the private sector to use Indian Space Research Organisation (ISRO) facilities and other relevant assets to improve their capacities.

Minister of State for Space, Jitendra Singh, on Wednesday said that private companies would be provided a level playing field in satellites, launches and other space related activities.

In addition to this, future projects for planetary exploration and outer space travel will also be opened for private sector, the minister said while highlighting the achievements of the NDA government after completion of its first year in office in its second term.

He informed that selection of astronauts had been done for India's first ever human space mission 'Gaganyaan' which is to be undertaken by Isro in the first half of 2021.

Singh added that the training of astronauts had begun in Russia, however it got interrupted due to the COVID-19 pandemic. He said that the project would be followed up soon.

Last month, Finance Minister Nirmala Sitharaman had said that the private sector is doing a lot of work in the space sector and in order to provide them level playing field, the Centre will provide a 'predictable policy and regulatory environment to private players'.

Isro has over a dozen facilities that designs and develops communication and earth observation satellites and rockets that can carry up to six tonnes of payload into space. It has planned over sixty missions over the next five years, which includes sending a man to space, attempt a moon landing second time, besides deep space missions to Mars and Venus.

Sitharaman had also said that the government has liberalised policies to allow startups and private businesses to participate in Isro's deep space missions.

<https://www.deccanchronicle.com/nation/current-affairs/110620/soon-private-sector-can-use-isro-facilities-to-ensure-level-playing-f.html>



Fri, 12 June 2020

Cascade sets the stage for superconductivity in magic-angle twisted bilayer graphene

Princeton-led study finds that superconductivity in magic-angle twisted bilayer graphene emerges from a highly interacting state of electrons

Place a single sheet of carbon atop another at a slight angle and remarkable properties emerge, including the highly prized resistance-free flow of current known as superconductivity.

Now a team of researchers at Princeton has looked for the origins of this unusual behavior in a material known as magic-angle twisted bilayer graphene, and detected signatures of a cascade of energy transitions that could help explain how superconductivity arises in this material. The paper was published online on June 11 in the journal *Nature*.

"This study shows that the electrons in magic-angle graphene are in a highly correlated state even before the material becomes superconducting," said Ali Yazdani, Class of 1909 Professor of Physics, the leader of the team that made the discovery. "The sudden shift of energies when we add or remove an electron in this experiment provides a direct measurement of the strength of the interaction between the electrons."

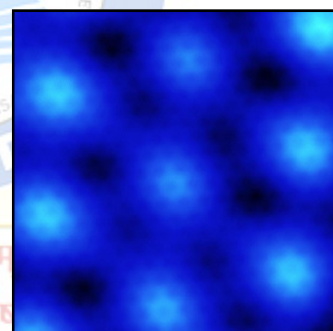


Image: Seen from above, the magic-angle bilayer graphene resembles a pattern known as moiré for its resemblance to a French fabric. [view more](#)

This is significant because these energy jumps provide a window into the collective behaviors of electrons, such as superconductivity, that emerge in magic-angle twisted bilayer graphene, a material composed of two layers of graphene in which the top sheet is rotated by a slight angle relative to the other.

In everyday metals, electrons can move freely through the material, but collisions among electrons and from the vibration of atoms give rise to resistance and the loss of some electrical energy as heat - which is why electronic devices get warm during use.

In superconducting materials, electrons cooperate. "The electrons are kind of dancing with each other," said Biao Lian, a postdoctoral research associate in the Princeton Center for Theoretical Science who will become an assistant professor of physics this fall, and one of the co-first authors of the study. "They have to collaborate to get into such a remarkable state."

By some measures, magic-angle graphene, discovered two years ago by Pablo Jarillo-Herrero and his team at the Massachusetts Institute of Technology (MIT), is one of the strongest superconductors ever discovered. Superconductivity is relatively robust in this system even though it occurs when there are very few freely moving electrons.

The researchers set out to explore how the unique crystal structure of magic-angle graphene enables collective behaviors. Electrons not only have a negative charge, but also two other characteristics: angular momentum or "spin," and possible movements in the crystal structure known as "valley" states. Combinations of spin and valley make up the various "flavors" of electrons.

The team particularly wanted to know how these flavors affect collective behaviors, so they conducted their experiments at temperatures just slightly above the point at which the electrons become strongly interacting, which the researchers likened to the parent phase of the behaviors.

"We measured the force between the electrons in the material at higher temperatures in the hopes that understanding this force will help us understand the superconductor that it becomes at lower temperatures," said Dillon Wong, a postdoctoral research fellow in the Princeton Center for Complex Materials and a co-first author.

They used a tool called a scanning tunneling microscope, in which a conductive metal tip can add or remove an electron from magic-angle graphene and detect the resulting energy state of that electron.

Because strongly interacting electrons resist the addition of a new electron, it costs some energy to add the additional electron. The researchers can measure this energy and from it determine the strength of the interaction force.

"I'm literally putting an electron in and seeing how much energy it costs to shove this electron into the cooperative bath," said Kevin Nuckolls, a graduate student in the Department of Physics, also a co-first author.

The team found that the addition of each electron caused a jump in the amount of energy needed to add another one - which would not have been the case if the electrons were able to go into the crystal and then move freely among the atoms. The resulting cascade of energy transitions resulted from an energy jump for each of the electrons' flavors - since electrons need to assume the lowest energy state possible while also not being of the same energy and same flavor as other electrons at the same location in the crystal.

A key question in the field is how the strength of interactions between electrons compares to the energy levels that the electrons would have had in the absence of such interactions. In most common and low-temperature superconductors, this is a small correction, but in rare high-temperature superconductors, the interactions among electrons are believed to change the energy levels of the electrons dramatically. Superconductivity in the presence of such a dramatic influence of interactions among electrons is very poorly understood.

The quantitative measurements of the sudden shifts detected by the researchers confirms the picture that magic-angle graphene belongs to the class of superconductors with strong interaction among the electrons.

Graphene is a single-atom-thin layer of carbon atoms, which, due to the chemical properties of carbon, arrange themselves in a flat honeycomb lattice. The researchers obtain graphene by taking a thin block of graphite - the same pure carbon used in pencils - and removing the top layer using sticky tape.

They then stack two atom-thin layers and rotate the top layer by exactly 1.1 degrees - the magic angle. Doing this causes the material to become superconducting, or attain unusual insulating or magnetic properties.

"If you're at 1.2 degrees, it's bad. It's, it's just a bland metal. There's nothing interesting happening. But if you're at 1.1 degrees, you see all this interesting behavior," Nuckolls said.

This misalignment creates an arrangement known as a moiré pattern for its resemblance to a French fabric.

To conduct the experiments, the researchers built a scanning tunneling microscope in the basement of Princeton's physics building, Jadwin Hall. So tall that it occupies two floors, the microscope sits atop a granite slab, which floats on air springs. "We need to isolate the equipment very precisely because it is extremely sensitive to vibrations," said Myungchul Oh, a postdoctoral research associate and co-first author.

Dillon Wong, Kevin Nuckolls, Myungchul Oh, and Biao Lian contributed equally to the work.

Additional contributions were made by Yonglong Xie, who earned his Ph.D. in 2019 and is now a postdoctoral researcher at Harvard University; Sangjun Jeon, who is now an assistant professor at Chung-Ang University in Seoul; Kenji Watanabe and Takashi Taniguchi of the National Institute for Material Science (NIMS) in Japan; and Princeton Professor of Physics B. Andrei Bernevig.

A similar cascade of electronic phase transitions was noted in a paper published simultaneously in *Nature* on June 11 by a team led by Shahal Ilani at the Weizmann Institute of Science in Israel and featuring Jarillo-Herrero and colleagues at MIT, Takashi Taniguchi and Kenji Watanabe of NIMS Japan, and researchers at the Free University of Berlin.

"The Weizmann team observed the same transitions as we did with a completely different technique," Yazdani said. "It is nice to see that their data is compatible with both our measurements and our interpretation."

The study, "Cascade of electronic transitions in magic-angle twisted bilayer graphene," by Dillon Wong, Kevin P. Nuckolls, Myungchul Oh, Biao Lian, Yonglong Xie, Sangjun Jeon, Kenji Watanabe, Takashi Taniguchi, B. Andrei Bernevig, and Ali Yazdani, was published June 11 in the journal *Nature*.

The study was supported primarily by the Gordon and Betty Moore Foundation's EPiQS initiative and the U.S. Department of Energy. Additional funding was provided by the National Science Foundation, including the MRSEC program through the Princeton Center for Complex Materials; ExxonMobil through the Andlinger Center for Energy and the Environment at Princeton; and the Princeton Catalysis Initiative. Support was also provided by the Ministry of Education, Culture, Sports, Science and Technology of Japan; A3 Foresight; the Japan Science and Technology Agency; the Simons Foundation; the David and Lucile Packard Foundation; and the Eric and Wendy Schmidt Fund for Transformative Technology at Princeton.

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https://www.eurekalert.org/pub_releases/2020-06/pu-cst060920.php

ज्ञान प्रसार एवम् विस्तार
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Coronavirus vaccine update: Johnson & Johnson expedites human trials, India's Panacea Biotec partners with US firm

Coronavirus (Covid-19) Vaccine Latest Update: Among Covid-19 vaccine front runners in human trials are AstraZeneca, Pfizer, BioNtech, Johnson & Johnson, Merck, Moderna, Sanofi and China's CanSino Biologics

Coronavirus (Covid-19) Vaccine Latest Update: Even though the US and China seem to be on the global frontline in terms of developing a Covid-19 vaccine, an Italian Health Ministry official said Europe was far ahead in the race and the results of an ongoing research could lead to first doses “by autumn-winter”

Meanwhile, Johnson & Johnson (J&J) has decided to expedite the start of human clinical trials for its experimental Covid-19 vaccine by two months to the second half of July. The move saw its shares rising nearly 2 per cent to \$148.69. On the other hand, Moderna Inc has started testing its vaccine candidate in a 600-subject mid-stage trial.

Coming to India, New Delhi-based biotechnology company Panacea Biotec has partnered with US-based Refana Inc to develop, manufacture and distribute an experimental Covid-19 vaccine, Reuters reported.

More than 100 potential Covid-19 vaccines are in various stages of development around the world. Among front runners currently in human trials are the Covid-19 vaccines being developed by AstraZeneca, Pfizer, BioNtech, Johnson & Johnson, Merck, Moderna, Sanofi and China's CanSino Biologics.

Coronavirus (Covid-19) vaccine latest updates:

□ Initially planned for September, American firm Johnson & Johnson said it had fast-tracked the start of human clinical trials for its recombinant Ad26.COVS-2 vaccine by two months to the second half of July. The decision may allow J&J to take part in the massive clinical trials program — Operation Warp Speed — planned by the US government.

In March, J&J signed deals with the US government to create enough manufacturing capacity to produce more than 1 billion doses of its vaccine through 2021, Reuters reported.

“Based on the strength of the pre-clinical data we have seen so far and interactions with the regulatory authorities, we have been able to further accelerate the clinical development,” said Chief Scientific Officer Paul Stoffels.

The study will test the vaccine for safety and early signs of efficacy in 1,045 healthy volunteers aged 18 to 55 years, and in those aged 65 and older. The trial will take place in the United States and Belgium.

The company is also in talks with the National Institutes of Allergy and Infectious Diseases (NIAID) to start larger, late-stage trials ahead of schedule.

For developing the Covid-19 vaccine, the technology being applied is similar to the one used to develop their investigational Ebola vaccine, as well as vaccine candidates for the Zika virus, RSV and HIV.

Coming to India, Panacea Biotec has become the fifth biotech company from the country to join global efforts in developing a Covid-19 vaccine by partnering with US-based Refana Inc.

In a statement to the stock exchanges, Panacea said the collaboration aims to make more than 500 million doses of the inactivated virus-based vaccine, with over 40 million doses expected to be available early next year. The firm said a joint venture firm would be set up in Ireland.

As per the partnership, Panacea Biotec will be responsible for product development and commercial manufacturing, while the JV entity undertaking clinical development and regulatory submissions across the world. Both Panacea and Refana will undertake sales and distribution of the vaccine in their respective territories.

“Whole inactivated viral vaccines have a higher probability of being safe and efficacious, given their long history and better understanding of their mechanism of action, which has been elucidated over many decades,” PTI quoted Panacea Biotec Managing Director Rajesh Jain as saying.

□ While the US and China may have grabbed the headlines on vaccine research and development, Europe seems to be not far behind. The adviser to the Italian Health Ministry for Covid-19 emergency told public TV RAI 3 that a vaccine research project conducted by an Anglo-Italian partnership was “in an advanced development phase”.

“Europe is far ahead of the United States in terms of new coronavirus vaccine, and we are getting ready for having a consistent part of it produced in Italy. With respect to the timing, if all goes well, we might have the first doses of the vaccine in Europe, and of course in Italy, by autumn-winter,” Ricciardi said.

The vaccine is being developed by Italian private company Advent-IRBM — based in Pomezia near Rome — and the Jenner Institute, which is part of the Oxford University in the United Kingdom. In April, the Anglo-Italian team announced the start of the human testing of the vaccine at the end of that month in the UK.

In another development in Europe that could help shots developed by companies like AstraZeneca and Johnson & Johnson, a Reuters report said European officials aim to speed up trials for coronavirus vaccines containing genetically modified organisms.

The strategy is aimed at securing enough doses of a possible vaccine for the bloc as it fears lagging behind the United States and China. The reform is expected to reduce member states’ power to impose extra requirements on drug companies when they conduct clinical trials on vaccines containing genetically modified organisms (GMOs).

“GMOs are very specific to very few vaccines based on adenovirus vectors,” Michel Stoffel of Vaccines Europe told Reuters, citing those developed by AstraZeneca and Johnson & Johnson among those that contain GMOs and would benefit from the possible changes.

Officials said as the Commission will also announce plans to use an emergency 2.4-billion-euro (\$2.7 billion) fund to make advance purchases of promising vaccines against the novel coronavirus.

□ Another potential Covid-19 vaccine being developed by Beijing Institute of Biological Products, which is affiliated to state-owned China National Pharmaceutical Group (Sinopharm), showed promise in trials in monkeys, triggering antibodies and raising no safety issues.

In a paper published by the medical journal “Cell”, researchers said the BBIBP-CorV vaccine induced high-level neutralising antibodies that can block the virus from infecting cells in monkeys, rats, guinea pigs and rabbits.

“These results support the further evaluation of BBIBP-CorV in a clinical trial,” researchers said in the paper.

Apart from BBIBP-CorV, Sinopharm, which has invested 1 billion yuan (\$141.40 million) in vaccine projects, is testing in humans another vaccine candidate developed by its Wuhan-based unit. The two shots have been given to more than 2,000 people in clinical trials.

<https://indianexpress.com/article/coronavirus/covid-19-coronavirus-vaccine-latest-update-today-johnson-and-johnson-panacea-biotec-moderna-oxford-6453952/>

U.S. company on track for large COVID-19 vaccine test in July

Worldwide, about a dozen COVID-19 potential vaccines are in early stages of testing

Washington: The first experimental COVID-19 vaccine in the U.S. is on track to begin a huge study next month to prove if it really can fend off the coronavirus, its manufacturer announced Thursday — a long-awaited step in the global vaccine race.

The vaccine, developed by the U.S. National Institutes of Health and Moderna Inc., will be tested in 30,000 volunteers — some given the real shot and some a dummy shot.

Moderna said it already has made enough doses for the pivotal late-stage testing. Still needed before those injections begin: results of how the shot has fared in smaller, earlier-stage studies.

But Moderna's announcement suggests those studies are making enough progress for the company and the NIH to get ready to move ahead.

Moderna launched its vaccine test in mid-March with an initial 45 volunteers. The company said it has finished enrolling 300 younger adults in its second stage of testing, and has begun studying how older adults react to the vaccine.

These initial studies check for side effects and how well people's immune systems respond to different doses. But only the still-to-come huge trial can show if the vaccine works.

Worldwide, about a dozen COVID-19 potential vaccines are in early stages of testing. The NIH expects to help several additional shots move into those final, large-scale studies this summer, including one made by Oxford University.

There are no guarantees any of them will pan out.

But if all goes well, there will be potential to get answers" on which vaccines work by the end of the year, Dr. John Mascola, who directs NIH's vaccine research center, told a meeting of the National Academy of Medicine on Wednesday.

Governments are beginning to stockpile hundreds of millions of doses of different vaccine candidates so they can be ready to start vaccinating as soon as scientists learn that one works. In the U.S, a program called Operation Warp Speed aims to have 300 million doses on hand by January.

<https://www.thehindu.com/sci-tech/health/us-company-on-track-for-large-covid-19-vaccine-test-in-july/article31810376.ece>

Fri, 12 June 2020

COVID-19 vaccine from China's Sinopharm clears animal tests

By Angus Liu

China has five COVID-19 vaccines in clinical trials. Now one of them, from state-owned Sinopharm, has reported positive results from animal tests.

The vaccine candidate, dubbed BBIBP-CorV and made from an inactivated form of the virus, induced high levels of neutralizing antibodies against SARS-CoV-2—the virus behind COVID-19—in rodents, rabbits and monkeys without triggering any serious adverse events, a team of Chinese researchers reported in the journal *Cell*.

A multi-arm phase 1/2 trial examining the vaccine's safety, as well as antibody and cellular immunity at three different dosing strengths, is ongoing, according to China's clinical trial registry.

To make the vaccine, scientists at Sinopharm subsidiary CNBG's Beijing Institute of Biological Products picked one viral strain from a patient that showed an optimal ability to replicate.

In mice, the researchers detected neutralizing antibodies that could block the virus from infecting host cells in all animals after immunization with the vaccine at three different dose levels. But the immunogenicity of a three-dose regimen was higher than that of both the one- and two-dose programs, according to the team.

The researchers went on to evaluate the vaccine in rhesus macaques with SARS-CoV-2, the virus that causes COVID-19. All monkeys that got a dummy shot showed a high viral load after the virus challenge. In contrast, the viral load in throat swabs was significantly lower in animals that got the low dose of the vaccine, and undetectable in those that received the higher dose.

Moreover, no immunized monkeys had a detectable viral load in their lungs, “demonstrating the BBIBP-CorV vaccination could efficiently block the infection of SARS-CoV-2 and COVID-19 disease in monkeys,” the researchers wrote in the study.

Inactivated vaccines are widely used to prevent infectious diseases such as the seasonal flu. As the researchers observed in their current study, it's a tried-and-true vaccine technology. Nevertheless, when the Trump administration selected five vaccine projects for its Operation Warp Speed, it failed to include an inactivated vaccine.

Before BBIBP-CorV, three other COVID-19 vaccine candidates had reported protection data in rhesus monkeys: the AstraZeneca-partnered recombinant vaccine from the University of Oxford, a DNA vaccine from Harvard Medical School and Johnson & Johnson, and shot from China's Sinovac Biotech that's also made from the inactivated virus.

The adenovirus-based recombinant technology allows easy genetic modification to make the vaccine, and it can induce potent immune responses, but the body's pre-existing immunity to the virus used as a vector can pose a challenge.

China's CanSino Biologics is currently leading the COVID-19 vaccine development efforts with an adenovirus-based shot. But in that vaccine's phase 1 trial, about half of the participants came into the study with neutralizing antibodies against the Ad5 vector, which “compromised” the immune response triggered by the vaccine.



An inactivated COVID-19 vaccine by China's state-owned Sinopharm reported positive outcomes in animal studies. (Pixabay)

In a monkey trial of the AZ-Oxford shot, now known as AZD-1222, 5 of 6 lung lobes in the vaccinated group showed a detectable viral load, although no animal developed pneumonia.

That said, inactivated vaccines have their own disadvantages. For example, compared with some next-generation platforms, they take longer to culture and produce. Protection from an inactivated vaccine is usually weaker, so large amounts of antigens are needed to achieve an adequate immune response. This means people may need several injections or “booster” doses. These shortfalls may be more relevant during a pandemic when large numbers of shots are needed quickly.

<https://www.fiercebiotech.com/research/inactivated-covid-19-vaccine-by-china-s-sinopharm-clears-animal-tests>



Fri, 12 June 2020

Polio vaccine could give temporary protection against COVID-19, scientists hope

It's unclear whether such an approach would work, and some experts are skeptical

By Kaitlin Sullivan

As the world waits for a coronavirus vaccine, some scientists are proposing that existing vaccines could give the body's immune system a much-needed temporary boost to stave off infection.

It's still unclear whether such an approach would work, and some experts are skeptical. Others — including researchers in Israel, the Netherlands and Australia — are already investigating whether a tuberculosis vaccine could help jump-start the immune system and make COVID-19 less deadly, though the World Health Organization strongly advises against using that vaccine until it's proven effective against the coronavirus.

In the U.S., several big names in virology — including Dr. Robert Gallo, one of the scientists who discovered HIV — are turning their attention to another existing vaccine, the oral poliovirus vaccine. It hasn't been licensed or available in the U.S. since 2000, but is still used in other countries where poliovirus still circulates, according to the Centers for Disease Control and Prevention. (Polio was eradicated in the U.S. in 1979.)

In a perspective piece published Thursday in the journal *Science*, Gallo and other experts from the Baltimore-based Global Virus Network outline why this particular polio vaccine might hold potential — and why the group is seeking funding and approval to start clinical trials to test their hypothesis.

The polio vaccine in question is a live vaccine — meaning it uses a weakened form of the live virus.

Live vaccines trigger a general immune response that helps the body fight off invaders until the immune system has time to develop specific antibodies. In theory, scientists believe that this temporary immune boost could provide protection for viruses the vaccine was not designed to prevent, such as the coronavirus, said a co-author of the *Science* piece, Dr. Konstantin Chumakov, a member of the Global Virus Network, an international coalition of virologists aimed at preventing and eradicating virus disease.

(Chumakov is also associate director of research at the U.S. Food and Drug Administration's Office of Vaccines, but spoke to NBC News on behalf of the Global Virus Network, not the FDA.)

Using existing live vaccines, including the oral poliovirus vaccine, would not be a permanent solution, but rather a temporary fix that may buy time until a coronavirus vaccine hits the market, Chumakov said.

“The protection would wane with time, but the beginning of an outbreak is an important time to keep the virus from spreading,” said Chumakov, noting that unlike the vaccine for tuberculosis, there are three types of oral poliovirus vaccine that could be administered back-to-back as soon as the immunity-boosting effects of one wears off, potentially extending such temporary protection.

The potential protection from the vaccine remains hypothetical, however, which is why Chumakov and others are calling for clinical trials.

In places where it’s still used, the oral poliovirus vaccine is typically administered to babies and not adults, so scientists can’t simply look at whether it already works to boost the immune system against other viruses in adults in these populations.

Chumakov referred to a three-year controlled trial conducted in Russia in the 1960s as the strongest evidence in support of using disease-specific vaccines to broadly ward off other viruses. In the study, which was conducted by Chumakov’s mother, researchers concluded that giving adults doses of the oral poliovirus vaccine cut deaths due to seasonal influenza and acute respiratory diseases three-fold.

Chumakov and his co-authors also cite other studies and anecdotes in which an oral poliovirus vaccine has effectively prevented another strain of poliovirus, which the vaccine was not specifically designed to treat.

However, other experts in the field are skeptical that the polio vaccine would provide the needed boost, and view the existing research as flimsy at best.

“I do believe the oral polio vaccine would provide some protection against new viruses, but so would catching cold,” said Rachel Roper, associate professor of microbiology and immunology at East Carolina University’s Brody School of Medicine. Catching any virus, she said, would set up the antiviral state associated with enhanced immunity.

Roper also expressed concern that administering a live vaccine that does not specifically target COVID-19 could create competition — called immunodominance — that prompts the immune system to target the live vaccine while leaving few resources to fight off COVID-19.

“We won’t see safety concerns until we test it in large trials that include a lot of people,” Roper said.

Indeed, the oral polio vaccine shouldn’t be given in an attempt to prevent COVID-19 outside of a clinical trial.

Adam Luring, an associate professor of microbiology, immunology and infectious diseases at the University of Michigan, said that if the oral poliovirus vaccine is proven to be effective, everyone would need to get the vaccine at the same time for it to work as planned, which would require a coordinated response with its own logistical challenges.

“There’s also the issue of some people already having immune responses against some vaccines, which means this could impede some of the antibody responses we would want,” said Luring. In other words, the oral polio vaccine may not boost the immune system, as the theory proposes, in people who have already received a polio vaccine.

“It’s a good idea, but we don’t know how it would pan out. There is some epidemiological evidence that is a sign that it’s something worth looking into,” he said.

Chumakov estimates that it would cost \$13 million to vaccinate the entire U.S. population, a relatively cheap solution if it works, and could provide a leg-up on future pandemics.

“This pandemic will go, but there will be another one. We will continue to get new and emerging diseases, and there will always be this dilemma of what do we do in the interim before we can develop a specific vaccine,” Chumakov said. “This is much bigger than just stopping COVID-19.”

<https://www.nbcnews.com/health/health-news/polio-vaccine-could-give-temporary-protection-against-covid-19-scientists-n1230071>