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THE ECONOMIC TIMES

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Apollo Micro, DRDO develop UV germicidal curing conveyor

The system that eliminates microbes including Covid-19 virus coming through baggage is developed for heavy traffic areas like airports, seaports, metro rail stations, malls, defence installations, companies with a substantial workforce, and educational institutions for installation at the entry points

Hyderabad: Apollo Micro Systems (AMS), a custom-built electronics and electromechanical solutions provider, has in collaboration with the public sector defence giant Defence Research & Development Organisation (DRDO), announced developing the world's first ultraviolet rays germicidal conveyor system.

The system that eliminates microbes including Covid-19 virus coming through baggage is developed for heavy traffic areas like airports, seaports, metro rail stations, malls, defence installations, companies with a substantial workforce, and educational institutions for installation at the entry points.

"So far, we have been dealing with a visible enemy," said DRDO chairman G Satheesh Reddy. "With this innovation, DRDO has shown its capability to fight the invisible enemies of humanity also."

The collaborators view that the ultraviolet rays germicidal conveyor system, which was developed in a record time, can also help in opening up of travel and tourism sector soon.

AMS has for decades into design, development and sale of high-performance, mission and time critical solution to defence, space and homeland security for the ministry of defence and government controlled undertakings.

Announcing the launch of the UV conveyor system, AMS and DRDO said the machine yielded great results when deployed as a test case at the Cochin Airport.

The UV conveyor comes with complete certified efficacy wherein the DRDO provided the medical validation to the technology where the ultraviolet rays curate the baggage and make them free of virus and other microbes.

"So far, we have been dealing with a visible enemy," said DRDO chairman G Satheesh Reddy. "With this innovation, DRDO has shown its capability to fight the invisible enemies of humanity also."

The DRDO chief advised AMS to seek to apply for global standardisation for the machine given huge scope for sales across the globe.

"We have had overseas enquiries too including from developed nations, but will export only after satisfying Indian needs," said the AMS managing director B Karunakar Reddy. "We believe that this system will be the most effective solution to many challenges that India and the world is facing."

https://economictimes.indiatimes.com/industry/healthcare/biotech/healthcare/apollo-micro-drdo-develop-uv-germicidal-curing-conveyor/articleshow/76645784.cms

Sat, 27 June 2020

कोरोना वायरसः DRDO ने बनाया बैगेज को डिसइन्फेक्ट करने वाला कन्वेयर

यह डिसइन्फेक्टर रोलर आधारित है. इस बैगेज डिसइन्फेक्टर को एयरपोर्ट, रेलवे स्टेशन, मेट्रो स्टेशन, बस अड्डा और सार्वजनिक संस्थानों के गेट में लगाया जा सकता है. इसमें यात्री अपना सामान एक तरफ से डालेंगे, तो दूसरी तरफ से यह डिसइन्फेक्ट होकर निकल आएगा.

आशीष पांडेय

- ***डीआरडीओ के चेयरमैन डॉ. जी. सतीश रेड्डी किया ऑनलाइन रिलीज***
- ***एयरपोर्ट, रेलवे स्टेशन, मेट्रो स्टेशन और बस अड्डे में लग सकता है***

कोच्चि: रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) की नेवल फिजिकल एंड ओशनोग्राफिक लेबोरेटरी ने कोरोना वायरस को खत्म करने वाला कन्वेयर विकसित किया है. यह कन्वेयर बैगेज के डिसइन्फेक्शन के लिए बनाया गया है. यह स्वचालित स्टैंड अलोन सिस्टम हैं, जो अल्ट्रावायलेट (यूवी) के जरिए कुछ सेकंडों में ही बैगेज और अन्य वस्तुओं को डिसइन्फेक्ट कर देता है.

डिसइन्फेक्टर

डीआरडीओ के चेयरमैन डॉ. जी. सतीश रेड्डी ने इस प्रोडक्ट को ऑनलाइन रिलीज किया है. यह डिसइन्फेक्टर रोलर आधारित है. इस बैगेज डिसइन्फेक्टर को एयरपोर्ट, रेलवे स्टेशन, मेट्रो स्टेशन, बस अड्डा और सार्वजनिक संस्थानों के गेट में लगाया जा सकता है. इसमें यात्री अपना सामान एक तरफ से डालेंगे, तो दूसरी तरफ से यह डिसइन्फेक्ट होकर निकल आएगा.

इससे यात्रियों को सहूलियत होगी और सैनिटाइज में की जरूरत नहीं होगी. साथ ही कोरोना का खतरा भी कम होगा. नेवल फिजिकल एंड ओशनोग्राफिक लेबोरेटरी ने हैदराबाद स्थित अपोलो माइक्रोसिस्टम्स लिमिटेड के साथ मिलकर इसको विकसित किया है.

आपको बता दें कि चीन के वुहान से फैले कोरोना वायरस ने पूरी दुनिया को बदलकर रख दिया है. इस जानलेवा वायरस को फैलने से रोकने के लिए पहले लॉकडाउन किया गया, लेकिन अब तक वैक्सीन नहीं बन पाई है और लोगों को धीरे-धीरे अनलॉक की ओर बढ़ना पड़ रहा है. ऐसे में कोरोना को फैलने से रोकने के लिए सैनिटाइजेशन और सोशल डिस्टेंसिंग के पालन करने पर जोर दिया जा रहा है.

वहीं, भारत समेत पूरी दुनिया में कोरोना वायरस के मामले तेजी से बढ़ते जा रहे हैं. हिंदुस्तान में कोरोना वायरस के मरीजों का आंकड़ा पांच लाख के पार पहुंच गया है, जिनमें से 15 हजार 300 से ज्यादा लोग दम तोड़ चुके हैं. इसके साथ ही 2 लाख 85 हजार 635 से ज्यादा लोग इलाज से ठीक भी हो चुके हैं, जिनको अस्पताल से डिस्चार्ज भी किया जा चुका है.

https://aajtak.intoday.in/story/coronavirus-drdo-developed-virus-obliterating-conveyor-to-disinfecting-baggage-items-1-1204661.html

BusinessLine

Sat, 27 June 2020

Covid-19: DRDO, Apollo Micro Systems launch UV tech to eradicate microbes from baggages

By V Rishi Kumar

Hyderabad: Apollo Micro Systems Ltd, in collaboration with Defence the Research and Development Organisation (DRDO), has developed an Ultra Violet Germicidal Conveyor System and has announced the launch in the market.

The system eliminates microbes found on the surface of baggage. Similar to usual X-Ray machines at such places, this UV Conveyor comes with complete certified efficacy.

In this collaboration, DRDO has developed and provided medical validation to the technology. The UV rays curate the baggage and make it virus and other microbes-free.

Heavy traffic areas like airports, seaports, Metro rail stations, malls, defence installations, companies with substantial workforce, schools, colleges, etc can operate with this installation at the entry point.

Test installation

G Satheesh Reddy, Chairman, DRDO, said, "The performance of this machine, as a test case, in Cochin Airport has yielded great results. With this innovation, the DRDO has shown its capability to fight the invisible enemies of humanity also. It is also a perfect example of Atmanirbhar Bharat."

He called upon Apollo-Micro to seek to apply for global standardisation for this machine.

B Karunakar Reddy, Managing Director, Apollo Micro Systems Ltd, said: "This is our little contribution in the ongoing fight against the pandemic. This system, once installed, will be effective against Covid-19 all other microbes in future. We have had overseas enquiries including from developed nations, but will export only after satisfying Indian needs."

"We believe that this UV system will be the most effective solution to many challenges that India and the world are now facing," he said.

https://www.thehindubusinessline.com/news/covid-19-drdo-apollo-micro-systems-launch-uv-tech-to-eradicate-microbes-from-baggages/article31924910.ece

NDTV

Sat, 27 June 2020

Defence research body develops UV conveyor belt for baggage disinfection

The automated stand-alone system uses UV bath for disinfecting baggage and other such items within seconds

Hyderabad: A virus obliterating conveyor for the disinfection of baggage has been developed by Naval Physical and Oceanographic Laboratory (NPOL), the Kochi based laboratory of Defence Research and Development Organisation (DRDO).

The automated stand-alone system uses UV bath for disinfecting baggage and other such items within seconds. The disinfector is based on a roller based conveyor carriage that carries baggage through a chamber equipped with accurately calibrated and optimally placed UVC sources.

"The sensing mechanism of the system automatically detects the entry of bags and powers on the UV illumination," read a release.

The system has been specifically designed to irradiate the body of the luggage in all directions and disinfect entire surface of the baggage as per the required intensity level and exposure time and has inbuilt features for ensuring prevention of direct UV exposure outside.

This baggage disinfector can be installed at airports, railway stations, metro stations, bus stations and institutional gates. NPOL has developed the system in partnership with Apollo Microsystems Limited, Hyderabad.

This baggage disinfector can be installed at airports, railway stations.

https://www.ndtv.com/india-news/coronavirus-india-defence-research-and-development-organisation-drdo-develops-uv-conveyor-belt-for-baggage-disinfection-2253026

ET Telecom.com
From The Economic Times

Sat, 27 June 2020

Atmanirbhar Bharat: Manufacturing of portable ventilators soon: ITI's Agarwal

Country's public sector company ITI Limited said that it is taking full advantage of Atmanirbhar Bharat (self-reliant India), and is gearing for mass-manufacturing of portable ventilators in partnership with the Defence Research and Development Organisation (DRDO)

By Muntazir Abbas

New Delhi: Country's public sector company ITI Limited said that it is taking full advantage of Atmanirbhar Bharat (self-reliant India), and is gearing for mass manufacturing of portable ventilators in partnership with the Defence Research and Development Organisation (DRDO).

"We are taking advantage of Atmanirbhar Bharat (self-reliant India), and import ban from a certain country, and are coming out with a sample portable ventilator in collaboration with DRDO next week, before kicking-off large-scale production," ITI chairman RM Agarwal said.

Following the novel Coronavirus or Covid-19 outbreak, the firm plans to produce locally-made cost-effective portable ventilators on the back of increasing demand.

In April this year, it had signed a Memorandum of Understanding (MoU) with DRDO.

The Bengaluru-based firm said that it aims to increase manufacturing revenues to 30% from the present 20% contribution.

The public sector firm's income from sales increased to 23.41% at Rs 2,058.87 crore in the year ended March 2020 when compared with the previous year contributing Rs 1,668.37 crore.

"For the first time, we have become EBIDTA or earnings before interest, taxes, depreciation, and amortization positive in 22 years," the top executive said, and added that the profit after tax (PAT) rose to Rs 150 crore during the quarter ended March 2020.

Company predominantly offers manufacturing services to India's defense sector and is currently running broadband connectivity programs in Maharashtra and Gujarat besides ambitious Network for Spectrum (NFS) initiative.

ITI, according to the official, has a confirmed order book of around Rs 5,000 crore and Rs 7,000 crore worth of advance purchase orders.

The state-run telecom equipment maker is also setting up an electronic manufacturing cluster (EMC) under the Ministry of Electronics and IT (MeitY) modified scheme in Bengaluru and has sought approval from the Department of Telecommunications (DoT) for a long-term lease.

The public sector firm has also started manufacturing of 3D-designed protective face shields at its Bengaluru-based facility.

https://telecom.economictimes.indiatimes.com/news/taking-advantage-of-atmanirbhar-bharat-soon-to-start-manufacturing-of-portable-ventilators-itis-agarwal/76643800

hindustantimes

Sat, 27 June 2020

1000-bed DRDO facility near Delhi airport to be operational by next month

By Vatsala Shrangi

New Delhi: Wooden slabs were being laid out and the ground was being levelled with multiple machines set in motion at a large open field. The white makeshift tents, the roofs and the pillars being placed could be spotted right from the road near Mehram Nagar village in southwest Delhi, which goes up to the Delhi Airport's domestic terminal.

Construction work is on in full swing at the site to turn the place into a full-fledged temporary air-conditioned 1,000-bedded Covid facility to meet the need for more beds to house Covid-19 patients in view of the rapid surge in cases. Till Friday, Delhi had recorded 77,240 cases of the disease.

The facility is being readied by the Defence Research and Development Organisation (DRDO), which is under the Ministry of Defence. It has been roped in by the Union Home Ministry for the construction. The Directorate of Civil Works and Estates (DCW&E), a wing of the DRDO, is handling the construction. Officials said the hospital is likely to come up by early next month.

According to officials at the site, the facility is coming up on around 25,000 square metres of land belonging to the Indian Air Force. Besides, patients and doctors' blocks, a testing lab and a pharmacy will come up. A mortuary is also being planned.

"The structure is coming up fast to meet the need for extra beds for Covid-19 patients. All services will be available within the premises, from testing of samples to accommodation for staff. There will be a patient block with four hut-shaped sections housing 250 beds each. In each of the huts, there will be around 120 cabins such that two patients can stay per cabin," Gagan Wadhwa, chief construction engineer (CCE), DRDO said.

Of the four sections to house patients, one will be dedicated for ICU beds with oxygen support. The complete facility will be fully air-conditioned.

"The facility is being designed as per World Health Organisation (WHO) guidelines for hospital care. Every bed will have oxygen support so that patients do not need to be shifted in case of a sudden drop in oxygen levels. Each section will have a set of toilets and bathrooms," he said.

Authorities said they are working on logistics of shifting patients to the centre, and which hospital will be attached to the facility. Patients will be given charging points for mobile phones/laptops and storage units by their beds to keep their belongings.

Alongside the patients' block, will be the doctors' area where patients will be assessed, plus another area to house the medical staff.

"Two doctors will be on duty for assessment. A separate block with cabins and an attached set of toilets is being built to provide on-site accommodation to around 50 doctors and paramedic staff. A cafeteria will be set up for medical staff," said another senior official on site, who did not wish to be named.

Authorities said they were working out provisions for food and other such services.

The doctors' block will have a donning and doffing area for personal protective equipment (PPE) kits. There will be a three-metre corridor for the movement of medical and support staff in order to maintain physical distancing.

The DRDO has tied up with BSES for power supply and back-up while Delhi Jal Board will be provide water supply. "A separate waste disposal and sewage management system is being developed. We were able to get water and power connections in such a short time because of the support of the union home ministry," Wadhwa said.

On Tuesday, union home minister Amit Shah had tweeted: "I would also like to inform the people of Delhi that a 1,000 bed full-fledged hospital with 250 ICU beds is being developed for Covid patients. DRDO and Tata Trust are building the facility. Armed forces personnel will man it. This Covid Care centre will be ready in next 10 days."

The Covid facility is being built to augment hospital infrastructure in the national capital. The Centre is collaborating with the Delhi government to set up adequate number of beds to cater to patients after a spike in Covid-19 cases.

This will be the second such facility to be manned by armed personnel after the 10,000-bedded one at Chhattarpur Radha Soami Satsang Beas, where a large part of the facility is set to be operational from Friday and will be manned by the Indo-Tibetan Border Police (ITBP).

https://www.hindustantimes.com/cities/1000-bed-drdo-facility-near-delhi-airport-to-be-operational-by-next-month/story-fEILsKiwRrEA8Ed2HMUO1K.html

THE NEW INDIAN EXPRESS

Sat, 27 June 2020

ITI, defence lab come up with portable ventilators

Venkateswarlu said SOARS can be used for forced breathing of patients who cannot breathe themselves

Bengaluru: What could turn out to be a big boost in the fight against Covid-19, Bengaluru-based public sector undertaking Indian Telephone Industries (ITI) and Defence Research and Development Organisation (DRDO) are jointly manufacturing portable ventilators.They are currently working on prototypes of Single Outlet Automatic Resuscitator System (SOARS), which will soon be tested at NIMHANS and RR Hospital in New Delhi.

D Venkateswarlu, Director, Production, ITI Limited, said they started working on the project after the transfer of technology from the Defence Bioengineering and Electromedical Laboratory (DEBEL), a DRDO laboratory in Bengaluru, and once the devices are tested, the production will be scaled up. RM Agarwal, Chairman & Managing Director, ITI, said the ventilators are primarily meant for the armed forces, but can also be used by civilian administrations.

Venkateswarlu said SOARS can be used for forced breathing of patients who cannot breathe themselves. It can run on alternate current, direct current or an external battery and the source of breathing is through compressed air or oxygen. The device weighs around 7 kg and can be used in hospitals, ambulances, railway stations or other places. "It is like an emergency aid," he said.

Some spares, including sensors for the device, have to be imported, mainly from the Netherlands and Singapore. If the device passes the test, ITI needs four to six weeks to scale up production. Meanwhile, ITI on Friday announced that it has signed an MoU with Tech Mahindra to work on 4G & 5G smart networks, Smart Cities and Healthcare services.

https://www.newindianexpress.com/states/karnataka/2020/jun/27/iti-defence-lab-come-up-with-portable-ventilators-2161986.html

hindustantimes

Sat, 27 June 2020

Indian Navy inducts indigenously developed anti-torpedo decoy system Maareech

'Maareech' has been designed and developed indigenously by the Defence Research and Development Organization (DRDO) and it is capable of detecting, locating and neutralizing incoming torpedo

New Delhi: The Indian Navy said on Friday it has inducted an advanced anti-torpedo decoy system called 'Maareech' that is capable of being fired from all frontline ships.

'Maareech' has been designed and developed indigenously by the Defence Research and Development Organization (DRDO) and it is capable of detecting, locating and neutralizing incoming torpedo.

Bharat Electronics Limited, a defence PSU, would undertake the production of this decoy system, the Navy stated.(HT FIle / Photo used for representational purpose only)

In a release, the Navy said, "The prototype of this system installed onboard a nominated naval platform had successfully completed all user evaluation trials and demonstrated the features as per the Naval Staff Qualification Requirements." This induction not only stands testimony to the joint resolve of the Indian Navy and DRDO towards indigenous development of defence technology, but has also given a major fillip to the government's 'Make in India' initiative and the country's resolve to become 'atmanirbhar' (self-reliant) in niche technology, the Navy said.

Bharat Electronics Limited, a defence PSU, would undertake the production of this decoy system, the Navy stated.

"Anti - Submarine warfare capability of the Indian Navy has received a major boost today with the conclusion of a contract for advanced torpedo decoy system Maareech capable of being fired from all frontline warships," it added.

https://www.hindustantimes.com/india-news/indian-navy-inducts-indigenously-developed-anti-torpedo-decoy-system-maareech/story-4BUig8Z17ey8cHHOVXSU6N.html

DNA
DAILY NEWS & ANALYSIS

Sat, 27 June 2020

Indian Navy inducts indigenously developed torpedo decoy system

Design & Development of this anti-torpedo decoy system has been undertaken indigenously by DRDO labs

Edited By Ahamad Fuwad

Anti - Submarine Warfare capability of the Indian Navy has received a major boost with the conclusion of a contract for Advanced Torpedo Decoy System capable of being fired from all frontline warships.

Design & Development of this anti-torpedo decoy system has been undertaken indigenously by DRDO labs - Naval Science and Technological Laboratory (NSTL) and Naval Physical & Oceanographic Laboratory (NPOL).

Bharat Electronics Limited, a Defence PSU, would undertake the production of this decoy system. The prototype of this system installed onboard a nominated naval platform had successfully completed all user evaluation trials and demonstrated the features as per the Naval Staff Qualification Requirements.

Navy said in a statement that the induction not only stands testimony to the joint resolve of the Indian Navy and DRDO towards indigenous development of Defence technology but has also given a major fillip to the government's 'Make in India' initiative and the country's resolve to become 'Atmanirbhar' in niche technology.

Christened as Maareech, the fully indigenous decoy system can divert under-water torpedo attacks on ships and submarines.

Maareech detects and locate the incoming torpedo and apply countermeasures to protect naval platform against attack.

The ATDS first detects and then confuse and divert the torpedo attacks on ships from under the water. By diverting the torpedoes' original course, it forces it to lose its energy thus preventing it from being effective on target. Torpedoes are self propelled weapon with a warhead and can be used under or on the water surface. They are one of the mainstay of sea-warfare attack systems.

https://www.dnaindia.com/india/report-indian-navy-inducts-indigenously-developed-torpedo-decoy-system-2829743

hindustantimes

Sat, 27 June 2020

UP firms making bullet proof jackets ditch China, say 'no trust': Report

Earlier this week, Niti Aayog member V K Saraswat had said that Indian companies manufacturing bullet proof jackets should avoid importing raw materials from China because of "inconsistencies in the quality" of the shipments

Edited By Amit Chaturvedi

New Delhi: Kanpur, one of the leading centres for making bullet proof jackets for Indian soldiers, has banned Chinese products, Hindustan Times' sister publication Hindustan reported on Friday.

The companies based in Kanpur have turned towards European and American firms to procure raw materials to build body armour and jackets which save lives of soldiers, Hindustan further reported.

The clamour has been growing to cancel contract with Chinese firms since the Galwan Valley face-off in which 20 Indian soldiers were killed (Representative Photo/Bloomberg)

Earlier this week, Niti Aayog member V K Saraswat had said that Indian companies manufacturing bullet proof jackets should avoid importing raw materials from China because of "inconsistencies in the quality" of the shipments.

"Many times raw materials imported from China (to produce bullet proof jackets) are not of good quality... We should avoid importing from Chinese sources because of inconsistencies of the raw material quality," Saraswat told news agency PTI on Monday.

Saraswat, also a former Defence Research and Development Organisation (DRDO) Chief, said companies producing bullet proof jackets for the army can get raw material from other sources that are the original equipment manufacturer (OEM) production agencies.

The Prime Minister's Office (PMO) had asked Niti Aayog to prepare a road map for "incentivising" domestic manufacturing of lightweight body armours and protective gears. The Bureau of Indian Standards has also finalised quality norms for body armours to be used by Indian forces.

The clamour for boycott of Chinese goods has been growing ever since the Ladakh-face off in the Galwan Valley on June 15.

These jackets use fibre or filament which are light weight and strong. The bullet proof jackets have two layers. The upper layer is ceramic and the inner most layer is made of ballistic material.

When a bullet strikes the jacket, the ceramic layer breaks the pointed head which releases energy. This energy us absorbed by the ballistic layer keeping the soldiers safe.

The industrialists Hindustan spoke to, said American and European companies are reliable when it comes to makign such important life-saving jackets and even helmets.

"We don't trust China, especially in a sensitive sector like defence. Therefore, we buy the raw material to make these bulleto proof jackets from Denmark and American companies," said Mayank Shrivastava, MD, NCFD.

India lost 20 of its army personnel, including a colonel, in the violent face-off along the Line of Actual Control (LAC), the biggest confrontation between the militaries of India and China in more than four decades.

https://www.hindustantimes.com/india-news/up-firms-making-bullet-proof-jackets-ditch-china-say-no-trust-report/story-xrT1gpXmsH6cAiglt55KCM.html

THE WEEK

Sat, 27 June 2020

'Deal for 114 fighters critical for IAF to retain edge against China'

Subramaniam notes China could have almost twice as many fighter units as IAF by 2030

Despite the Indian Army announcing that it had agreed with China to begin mutually 'disengaging' from contentious areas across the Line of Actual Control (LAC) in Ladakh, tension remains high following the clash on June 15.

A Su-30MKI fighter of the Indian Air Force carrying a BrahMos missile | Twitter handle of IAF

Reports and satellite imagery have raised concerns that China is increasing its troop concentrations in the region. The Indian Air Force began deploying fighter aircraft and helicopters to forward air bases in the region a week ago. But discourse on a potential conflict with China has mostly been dominated by a focus on ground forces. The potential use of air power on the border with China has been a subject of debate ever since the Jawaharlal Nehru government decided against deploying Indian Air Force fighter and attack aircraft against the invading Chinese forces in 1962.

The Observer Research Foundation, a premier think tank, on Friday published a paper authored by retired air vice marshal Arjun Subramaniam, who is presently a strategic affairs commentator. In the paper titled, *Air Power in Joint Operations: A Game Changer in a Limited Conflict with China*, Subramaniam argues there is a realisation in the Indian policy making establishment "that air power could emerge as a key element in future India–China conflicts". As the basis for this, Subramaniam cited the Narendra Modi government's move to fast-track purchase of 33 fighter aircraft—21 MiG-29 jets and 12 Su-30MKI fighters—from Russia. The purchase of these jets had been in the pipeline for several months.

Subramaniam declared, "A greater debate is required on the optimal ways of leveraging Indian air power on/across the LAC, should situations escalate beyond face-offs". Subramaniam's paper also refers to the findings of a study of Harvard Kennedy School that had claimed that India had military advantages against China in a potential conflict. Subramaniam disputes some of the findings of the Harvard study on the Indian Air Force having more 'fourth-generation' fighters in the region than China.

"The Harvard paper engages in a bit of 'India overreach' by suggesting that the IAF's current inventory of fourth-generation fighters (Mirage-2000s, MiG-29 UPG and SU-30 MKI) are more than a match for the PLAAF SU-30s, J-10s and J-11s. This might be qualitatively true, but quantitatively, the Harvard paper's estimation is not corroborated by those of other studies," Subramaniam writes in the Observer Research Foundation paper. He also dispute the "The Harvard

report's suggestion that the PLAAF would allocate and train barely 15 percent of its fourth- and fifth-generation fighters for operations in an India scenario".

Citing another study, Subramaniam estimates the Chinese Air Force's "current inventory of fourth-generation platforms could have crossed 850, or about 40 squadrons. One can project that this figure will go up to approximately 50 squadrons of fourth-generation fighters by 2025". Referring to the Chinese Air Force's induction of the J-20 stealth fighter, Subramaniam argues the Indian Air Force will lose the "qualitative "advantage of the SU-30 MKI and the limited number of Rafales" in this decade.

Subramaniam also acknowledges China's inventory of H-6 strategic bombers, which can fire cruise missiles at ranges of 500km or more. The Indian Air Force does not have a comparable aircraft or weapons.

Subramaniam was cautious about the capabilities of the indigenously built HAL Tejas fighter. The Indian Air Force is expected to buy 83 Tejas MK1A fighters. Subramaniam notes the LCA will offer modest capabilities. He notes, "It is too early to assess whether the LCA MK-1A will be able to penetrate the air-defence network on the Tibetan Plateau. For now, it must be assumed that they will primarily be used in favourable conditions—to hold the line on the western sector, and provide local air defence and limited offensive support around the LAC."

Subramaniam terms as critical the Indian Air Force's plan to buy 114 multirole fighters, at an estimated cost of $15 billion. He writes, "The acquisition of the 114 MRFA aircraft with high-end fourth-generation capability could be critical for the IAF to maintain its combat edge over the PLAAF, since neither the LCA MK-1A nor the proposed MK-2 are likely to supplement the SU-30 MKIs and the Rafale as its vanguard". Last month, Chief of Defence Staff General Bipin Rawat caused a flutter when he hinted the proposed deal to buy 114 fighter jets could be shelved in favour of buying more Tejas jets.

Subramaniam paints a worrying picture for the Indian Air Force by 2030, in terms of numbers. He notes, "Even in the best-case situation of the timely induction of all LCA MK-IA aircraft, emergency purchase of the SU-30s and MiG-29s, the two Rafale squadrons, and up to six multirole fighter Aircraft (MRFA) squadrons (should the pending 114 aircraft contract go through), the IAF will at best have 32–34 fighter squadrons by 2030." This is in comparison to China's PLAAF, which he estimates will have around 50 squadrons of "strong fourth-generation fighters" and 10 squadrons of modest fifth-generation J-20-class aircraft.

Subramaniam notes the Indian Air Force could still retain a numerical advantage in operations in the Tibet region thanks to its network of 10-12 airbases. He writes, "However, a combination of the dense air defence cover, superior EW and space-based intelligence, and the availability of large numbers of the J-20 fifth-generation aircraft will pare the current qualitative advantage of the IAF, unless there is the speedy induction of the 114 MRFA aircraft".

https://www.theweek.in/news/india/2020/06/26/deal-for-114-fighters-critical-for-iaf-to-retain-edge-against-china.html

DECCAN Chronicle

Sat, 27 June 2020

Disengagement will take time, says Indian Army as China continues troop build-up

It is the local commanders who will meet and decide stepwise disengagement at various locations

By Pawan Bali

New Delhi: Indian army is not expecting disengagement with the Chinese army to start any time soon in Ladakh sector. "Disengagement will take time," said sources on Thursday.

Since the Corps Commander meeting between the two armies on Monday, there has been no major general or commanding officer level talks. It is the local commanders who will meet and decide stepwise disengagement at various locations. Currently, there is a high level of distrust of the Chinese army in the Indian security establishment.

General MM Naravane meets soldiers at Leh during his two-day tour. (PTI)

Army Chief General MM Naravane, who has returned after his two-day visit to Ladakh sector, is expected to brief the political leadership about Indian Army's operational preparedness to deal with any misadventure by the China. He will also give an assessment of the situation in the Ladakh and options available with India.

India and China had on Monday reached a "consensus to disengage" from "all friction areas" in Eastern Ladakh during the Corps Commander meeting between the two armies.

Even as the Chinese army has been talking of peace, it has been building up its troops at various points on the border. It has even build up its troops in new areas like Depsang and Daulat Beg Oldie sector to put pressure on the Indian Army.

However, Indian Army has done counter deployment in the sector. In Galwan valley, Chinese army is still present in large numbers at a short distance from patrolling point 14, the site of June 15 bloody clash between Indian and Chinese soldiers. However, in Galwan valley Indian soldiers have started dominating the peaks which will help them to counter any Chinese move in the area. The Chinese have continued with their build up in Hot Springs and Gogra post.

In northern banks of Pangong Tso, which is the main issue of contention between the two sides, Chinese soldiers are reportedly continuing with their activities and trying to build structures in new positions. There is a large build-up of Chinese soldiers around finger 4, where they have constructed structures and bunkers to prevent Indian soldiers from patrolling finger 4 to 8. Indians, who have their base around finger 3 used to patrol till the finger 8 area.

https://www.deccanchronicle.com/nation/current-affairs/260620/disengagement-will-take-time-says-indian-army-as-china-continues-troo.html

THE ECONOMIC TIMES

Sat, 27 June 2020

India warns China that attempts to alter status quo will have 'ripples, repercussions'

India warned China that trying to alter the status quo will have 'ripples and repercussions' in bilateral ties

Beijing: India on Friday warned China that trying to alter the status quo on the ground by resorting to force will not just damage the peace that existed on the border areas but can also have "ripples and repercussions" in the broader bilateral relationship, and demanded that Beijing stop its activities in eastern Ladakh.

Misri's comments came a day after the external affairs ministry said China has been amassing a large contingent of troops and armaments along the LAC in eastern Ladakh since early May, and warned that continuation of the current situation would only vitiate the atmosphere for the development of the relationship.

The only way to resolve the current military standoff along the LAC in eastern Ladakh was for Beijing to realise that trying to "change the status quo by resorting to force or coercion, is not the right way forward," India's ambassador to China Vikram Misri said in a hard-hitting interview to PTI.

Asserting that actions taken by the Chinese forces on the ground have damaged "considerable trust" in the bilateral relationship, the Indian ambassador added that it was entirely the responsibility of the Chinese side to take a careful view of the relations and to decide which direction the ties should move.

Noting that maintenance of peace and tranquillity "on the border is sine qua non for progress in the rest of bilateral relationship between India and China", Misri said: "The resolution of this issue is quite straight forward from our perspective. The Chinese side needs to stop creating obstruction and hindrances in the normal patrolling patterns of the Indian troops," he said.

He also rubbished China's claim of sovereignty over Galwan Valley in Ladakh as "completely untenable", and asserted that these kinds of exaggerated claims are not going to help the situation.

"Whatever activities we may be carrying on have always been on our side of the Line of Actual Control (LAC), so the Chinese need to stop activities to alter the status quo. It is very surprising that they should attempt to do so in a sector which has never before been a sector of concern." he said.

Emphasising that India is "very aware and very clear about the alignment of the LAC in the Galwan Valley," he said our troops have been patrolling up to these areas without any difficulty for a very very long period of time.

Misri's strong comments came in response to the recent claims by the Chinese military and the foreign ministry of sovereignty over Galwan Valley.

On the Chinese Ambassador Sun Weidong's assertion on Thursday that the onus is on India to deescalate tensions, Misri said, "I think we have been very clear, and very consistent in pointing out that it has been Chinese actions over an extended period of time, that are responsible for the current situation".

"In fact beginning with the time frame of April and May, I would say there were a number of Chinese actions along the LAC in the Ladakh sector in the western sector that interfered with and hindered with the normal patrolling activities of our troops in that sector. This led obviously to a few face-off situations," he said.

During an interview with PTI, Sun refused to reply to questions about China's transgressions of the LAC. He was asked why China has not been allowing Indian patrols from Finger 4 to Finger 8

areas in Pangong Tso even though the areas belonged in the Indian side of LAC. He was also asked why China has resorted to massive build up of troops in almost all areas of the 3500 km LAC. But Sun sidestepped the questions and remained mum. Misri said he "would underline the remarks of our External Affairs Minister (S Jaishankar) when he spoke to Foreign Minister Wang Yi that these developments cannot but have an impact on the bilateral relationship."

"The bilateral relationship is of great value to the two countries. It is important not just for us but also regionally important", he said.

"So I think there should be a realisation on the Chinese side that there is no gain in trying to alter the status quo on the ground especially by resorting to force ... that will not just damage the peace and tranquillity that existed on the border but it can have ripples and repercussions in the broader bilateral relationship," Misri said.

"We have no wish and desire for that. Therefore, it is entirely the responsibility of the Chinese side to take a careful view of our bilateral relations and to decide which direction the bilateral relationship to move forward", he said.

"To my mind there is only one answer, I do very much hope that the Chinese side will also see it in that way", he added.

Noting that in the Galwan Valley especially there has never been any difference as to where the LAC lay, the Indian envoy said :"It is very surprising that they should have chosen to, in the context of these recent developments, to do this kind of thing in a sector which has never before been a sector of concern."

"So for China to now voice these kinds of claims is completely untenable. These kinds of exaggerated claims are not going to help the situation. The kind of language that has been used is not helpful to the resolution of this situation," he said.

In the ongoing meetings including at the military level that are going on "we hope that the Chinese side will realise its responsibility in de-escalation and disengagement", he said.

"That would be a true resolution of this issue", he said.

Misri's comments came a day after the external affairs ministry said China has been amassing a large contingent of troops and armaments along the LAC in eastern Ladakh since early May, and warned that continuation of the current situation would only vitiate the atmosphere for the development of the relationship.

https://economictimes.indiatimes.com/news/defence/india-warns-china-that-attempts-to-alter-status-quo-will-have-ripples-repercussions/articleshow/76650821.cms

THE ECONOMIC TIMES

Sat, 27 June 2020

Countering China's aggression: US bill seeks to train Indian fighter pilots

The National Defence Authorization Act (NDAA) for the 2021 fiscal year starting October, which the US Senate took up on Thursday, seeks fighter jet training detachment for India, Japan and Australia in the US Pacific territory of Guam

By Dipanjan Roy Chaudhury

New Delhi: The United States will offer fighter jet training to India, Japan and Australia even as it plans multiple initiatives to counter China's aggression across Asia Pacific including its standoff with India along the Line of Actual Control.

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Further, secretary of state Mike Pompeo on Thursday said the US is moving troops from Europe and deploying them to other places in response to the Chinese threat to India and Southeast Asian nations.

Six months ago US defence secretary Mark Esper and Singapore defence minister Ng Eng Hen had signed a memorandum of understanding for Singapore to set up a fighter jet training detachment in Guam.

Japan, one of India's emerging strategic partners and member of the quadrilateral, has also highlighted the need to keep an eye on China's military capabilities and intentions across Asia.

Japanese defence minister Taro Kono acknowledged the persistent threat from China and North Korea, not only in the hard power arena but also in cyberspace, at a special briefing for foreign media in Tokyo on Thursday after Japanese forces chased a Chinese submarine out of Japanese waters.

"We need to raise awareness of what's going on around Japan," Kono said, pointing to China's recent actions in the South China Sea, Hong Kong, and along its border with India.

The NDAA 2021 calls for the US secretary of defence to submit to the Congressional defence committees a report assessing the merit and feasibility of entering into agreements similar to that of Singapore with other US allies and partners in the Indo-Pacific region, to include Japan, Australia, and India, officials said.

Among other things, the bill calls for a Pacific Deterrence Initiative, which will focus resources on the Indo-Pacific, addressing key military capability gaps, reassuring US allies and partners, and bolstering the credibility of the US, said Senator Jim Inhofe, chairman of the Senate Armed Services Committee.

The bill proposes procurement of 48 long-range anti-ship missiles (LRASMs), which it said will be especially useful in the Indo-Pacific, which the defence department has named its "priority theatre". NDAA also seeks acceleration in the American effort to establish F-35A operating locations forward in the Indo-Pacific region.

https://economictimes.indiatimes.com/news/defence/countering-chinas-aggression-us-bill-seeks-to-train-indian-fighter-pilots/articleshow/76654927.cms

THE ECONOMIC TIMES

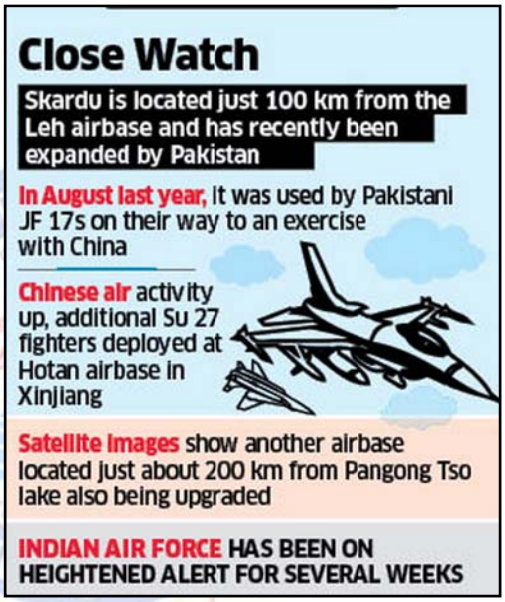
Sat, 27 June 2020

India keeps vigilant eye on Pakistan-Occupied Kashmir as Chinese air activity increases

While the PLAAF can make up for the high altitude by deploying aerial tankers, Indian military planners have always been wary that in a time of conflict, airbases in PoK could be handed over to China. Limited activity can be observed at the Skardu airbase, and an IL 78 tanker of the PLAAF landed there a few days ago, besides some Pakistan Air Force transport aircraft

By Manu Pubby

New Delhi: India is keeping a vigilant eye on airbases in Pakistan-Occupied Kashmir (PoK) after a Chinese refueller aircraft landed in Skardu last week. Also, Chinese air activity has increased opposite Eastern Ladakh, raising the possibility of PLA Air Force (PLAAF) using airbases in PoK.



Indian and Chinese forces are in the middle of an escalating standoff in Eastern Ladakh with New Delhi forced to bring in a large number of troops in the area after Beijing amassed forces, which were otherwise supposed to be undergoing annual military exercises.

The Indian Air Force has been on heightened alert for several weeks now and extensive ferry missions have been undertaken to take supplies and troops to Ladakh. Besides, Chinese air activity – additional Su 27 fighters are believed to have been deployed at Hotan airbase in Xinjiang – is being closely monitored and their deployments mirrored on the Indian side.

The PLAAF has several airbases in and around Tibet, with Hotan housing the most combat assets, but they suffer from one debilitating issue – most are located at altitudes over 4,000 feet, making it difficult for fighters to take off with a full weapons load and fuel. Several Indian airbases, on the other hand, are located in the plains of Punjab and Haryana, giving them an edge.

Satellite Images

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Sources said that limited activity can be observed at the Skardu airbase, and an IL 78 tanker of the PLAAF landed there a few days ago, besides some Pakistan Air Force transport aircraft. Skardu is located just 100 km from the Leh airbase and has recently been expanded by Pakistan.

In August last year, the Skardu base was used by Pakistani JF 17s on their way to the PLAAF base at Hotan for a joint exercise. The Shaheen series of exercises involving J 10s from China and Pakistani JF 17 jets had been carefully monitored by India and took place in the area opposite Eastern Ladakh.

In the past two years there has been a significant increase in air activity in Tibet. While the PLAAF earlier used to deploy its fighters to forward bases only in summers, a year-round deployment has now become the norm.

Recent satellite images show that another airbase located just about 200 km from the Pangong Tso lake is also being upgraded, with work on as recently as May this year. The Ngari Gunsa airbase in Tibet is housing Su 27 fighter jets and work to expand the runway has been ongoing.

In the past, Pakistan had no qualms in allowing other nations to use its airbases and military camps. During the Afghanistan campaign launched in 2001, US forces had enclaves at several Pakistani airbases to support combat missions against the Taliban.

https://economictimes.indiatimes.com/news/defence/india-keeps-vigilant-eye-on-pok-as-chinese-air-activity-increases/articleshow/76654173.cms

THE ECONOMIC TIMES

Sat, 27 June 2020

Delhi apprises world capitals of LAC action, PLA's buildup

Delhi has also informed various foreign interlocutors that respecting and strictly observing the Line of Actual Control is the basis for peace and tranquillity in the border areas. The Indian Army has been patrolling all along the LAC, including in the Galwan Valley, for a long time

By Dipanjan Roy Chaudhury

New Delhi: The Ministry of External Affairs and Indian Embassies have briefed key world capitals on situation along the Line of Actual Control (LAC) and India's active role in maintaining peace amid China refusing to restore status quo despite several rounds of negotiations.

ET has reliably learnt that MEA has briefed key partners that the Chinese side has been amassing a large contingent of troops and armaments along the LAC since May, which is not in accordance with the provisions of various bilateral agreements, especially the key 1993 Agreement.

Delhi has also informed various foreign interlocutors that respecting and strictly observing the Line of Actual Control is the basis for peace and tranquillity in the border areas. The Indian Army has been patrolling all along the LAC, including in the Galwan Valley, for a long time. All infrastructure built by the Indian side has always been on its own side of the LAC, the MEA told various key partners for India.

They were told that the Indian side has never undertaken any actions across the LAC and has never attempted to unilaterally change the status quo. However, that has not been reciprocated by the Chinese side and that from time to time has led to face-offs. ET has learnt that the world capitals were also informed that the Indian side has never undertaken any actions across the LAC and has never attempted to unilaterally change the status quo. The world capitals were updated about various meetings between India and China.

https://economictimes.indiatimes.com/news/defence/delhi-apprises-world-capitals-of-lac-action-plas-buildup/articleshow/76655006.cms

ZEENEWS

Sat, 27 June 2020

How USA plans to help India, corner China and the real story of Tibet's repression

In order to counter China's People's Liberation Army (PLA), the US is reviewing its global deployment of forces in Asia by reducing them from Europe

Edited By Arun Kumar Chaubey

New Delhi: Amid India-China border standoff along the Line of Actual Control in Ladakh, a threat of the Third World War appears to be looming large. The global community seems to have realised this but the United States is the first country to openly criticise China's aggressive policies.

The US has officially stated that it is reviewing its global deployment of forces to counter the growing Chinese military threat to countries like India, Malaysia, Indonesia, and the Philippines. US Secretary of State Mike Pompeo said this in response to a question during the virtual Brussels Forum 2020 of the German Marshall Fund on Thursday.

In order to counter China's People's Liberation Army (PLA), the US is reviewing its global deployment of forces in Asia by reducing them from Europe. American military bases in many European countries were established to deal with the threat of Russia for years. Now, China and its Communist Party have emerged as the biggest threat to the world. Under the force posture review, the US is reducing the number of its troops in Germany from about 52,000 to 25,000.

China has been fast expanding military and economic influence in the strategic Indo-Pacific region, triggering concern in various countries of the region and beyond. China is currently engaged in hotly contested territorial disputes in both the South China Sea and the East China Sea. It has built up and militarised many of the islands and reefs under its controls in the region.

Pompeo also said that China's PLA was indulging in provocative military actions, while referring to the ongoing military standoff in eastern Ladakh where the PLA killed 20 Indian soldiers on June 15 during a violent face-off, and also cited China's continued aggression in the South China Sea.

If there arises a situation of the Sino-India war, America may come out in support of India, but it would lead to the third world war. Then the countries like Pakistan and North Korea may side with China, while America, Japan, Australia along with India would oppose China's aggression. Countries like Russia, however, may face the dilemma of choosing an old friend India or China.

The question arises why should such a situation come. Rather, the world should unite to question China against its expansionist policies and military activities, which if not stopped now, would create a crisis for the world.

US Secretary of State Mike Pompeo's statement indicates at American strategy to encircle China, but the real siege of the Communist nation will be from Southeast Asia. America has taken the name of countries of this region, especially Vietnam, Indonesia, Malaysia, and the Philippines, which are facing the military wrath of China in the South China Sea.

The US entered into an agreement with the Philippines since 1988, while Vietnam has also come closer to the US amid threats from China and is getting the US Navy's support in safeguarding its coastline. American defence cooperation with Indonesia and Malaysia has gradually increased, while in Singapore, the US has an agreement to use the latter's Air and Naval bases.

If America's military presence in these countries increases further, China is likely to be encircled from all the directions in case of any major confrontation. China is very aggressive in this region as well as in the East China Sea. It had openly issued a military threat to Taiwan by sending its fighter jets, but Taiwan repulsed that move.

The US military does not have a permanent base in Taiwan, but it often comes here for training and patrolling. Currently, three US aircraft carriers are stationed near Taiwan. In the Asia-Pacific region, the US military bases are in South Korea and in Japan to deal with China and its friend North Korea.

In South Korea, over 28,000 troops of the US Army, Air Force, and Navy are already stationed. This region has about 15 small and large US military bases. In Japan, the US has about 23 small and large military bases with over 54,000 troops. The 7th largest fleet of the US Navy, with about 50 warships and 20,000 naval soldiers always remain ready in Japan.

Along with South Korea and Japan, about 5,000 US troops are permanently stationed in Guam, a small island, where the US Air Force has it base.

Meanwhile, China's real expansionist face can be witnessed in the nations where it has established its authority. Tibet is one such nation that testifies the atrocities committed by the Communist Party of China and its ruthless army. People who ran away from the erstwhile Buddhist nation still remember those atrocities.

In Ladakh, Zee News visited one such village where the refugees, who fled from Tibet, now live there for years. They recall as to how China first enticed Tibetan people with ration and money and then grabbed their land, and destroyed their culture as well as places of worship.

President Lobsang Sangay of Tibet's government in exile told Zee News how China and its army persecuted Tibetans even today, adding that 10 lakh Tibetans have so far been massacred and 98 percent of their monasteries have been ruined.

After the Chinese occupation of Tibet in 1959, 560 Tibetan citizens reached Ladakh. Currently, there are 7500 Tibetan refugees all over Ladakh. They lived in tents and camps until 1975 but were later settled in Angling, Choklamsar and Jangthang villages of Ladakh.

Although Tibetan refugees are grateful to India, they still aspire for the liberation of Tibet from China's occupation.

https://zeenews.india.com/india/how-usa-plans-to-help-india-corner-china-and-the-real-story-of-tibets-repression-2292172.html

DefenceNews

Sat, 27 June 2020

India, Russia to fast track production of Ka-226T chopper, AK203 rifle

India and Russia have agreed to resolve issues around the production of Ka-226T helicopters and AK203 rifle and put them on a fast track. Fast-tracking for the production of Ka 226T and AK203 was discussed during Defence Minister Rajnath Singh's visit to Moscow earlier this week.

"The parties have resolved and will make all efforts to fast-track the launching of these projects," sources told DNA.

Ka-226T helicopter project announced in 2014 is expected to replace Indian army's light utility helicopters Cheetah and Chetak.

The main aim of the project is "Make in India" production of the helicopters with scaled up role of Indian companies. Many of local Indian vendors are expected to become the suppliers as the Russian-Indian joint venture has signed MoUs with a number of companies.

Sources said "India will be able to receive some crucial helicopter technologies" with "integration of various helicopter systems being possible."

While the intergovernmental agreements were signed are a long time ago, a formal contract is still not signed and the actual project's launch is still pending.

Ka-226T helicopters will be produced at a factory in Bengaluru. The maximum speed of Ka-226T helicopters is 220kmph and it can carry a weight of up to 3600kg with a payload of 785 kg.

AK203 is a modern variant of Kalashnikov family of rifles and will be produced at the Indo Russia Rifles Private Limited (IRRPL) rifle manufacturing facility in Korwa, Amethi. Compared to earlier Kalashnikov rifles, AK203 is considered to have better accuracy.

The rifle has customizability due to use of the Picatinny rail which enables instalment on the basic rifle of additional equipment and therefore can be quickly adapted for the various components of the Indian Forces. The gun has been already tested under the conditions of extreme heat and cold.

https://www.defencenews.in/article/India,-Russia-to-fast-track-production-of-Ka-226T-chopper,-AK203-rifle-861288

Sat, 27 June 2020

IAF detects IL 78 tanker of the PLAAF in POK

India is keeping a vigilant eye on air bases in Pakistan-Occupied Kashmir (PoK) after a Chinese refueller aircraft landed in Skardu last week. Also, Chinese air activity has increased opposite Eastern Ladakh, raising the possibility of PLA Air Force (PLAAF) using airbases in PoK. Indian and Chinese forces are in the middle of an escalating standoff in Eastern Ladakh with New Delhi forced to bring in a large number of troops in the area after Beijing amassed forces, which were otherwise supposed to be undergoing annual military exercises.

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Satellite Images

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https://idrw.org/iaf-detects-il-78-tanker-of-the-plaaf-in-pok/

Science & Technology News

THE HINDU

Sat, 27 June 2020

Projects are affected with industries not back to production, says ISRO Chairman Sivan

With supply chains yet to resume, ISRO's planned launches and satellite activities are delayed, says Chairman K. Sivan

By Madhumathi D.S.

Bengaluru: On January 1, 2020, the Indian Space Research Organisation set out an ambitious target of 25 satellites and launch missions for the year. With three months now lost due to the COVID-19 pandemic, leaving the space agency without a single home launch yet, ISRO Chairman and Secretary, Department of Space K. Sivan said though supply of hardware from industries has been affected, work at each centre is on track.

In the last three months how have ISRO and its centres been affected by the COVID-19 pandemic?

Definitely there has been some impact on our programme because of the lockdown. But we are not able to assess it now. We are yet to get stabilised output. We have two kinds of activities. One is in-house research and development. The other one is project or mission related, done outside in industry. ISRO's own activities are not affected. What is affected is the supply of hardware from industries.

Most of our work is done outside in the industry and we are waiting for the industry to start functioning fully. Only then, after some time, can we review and make some assessments. At the same time ISRO is not keeping quiet. Each centre has its in-house facilities and is carrying out many developmental activities in full steam.

When do you think you can resume launching satellites?

Because of the widespread impact of the coronavirus pandemic, project activities and mission work can be decided only later, when we can rightly assess the situation.

By hardware do you mean satellites, launch vehicles, rocket tanks and systems, etc? Could you please elaborate how hardware issues have impacted your projects?

Yes. Hardware for all our programmes is affected. Most of our hardware comes from Mumbai and other cities but our vendor industry is not yet fully functional. Project work is affected because industry is not fully geared up for production; inter-state movement [of supplies] is affected and also because employees` movements are not normal.

Around 500 small, medium and large industries contribute to the space programme in many ways. The virus and its effect are spread across the country. Even if hardware is made, transporting

it [to the respective centres] is the problem. We cannot move the rakes, vehicles or the trailers. For example, if they go from Thiruvananthapuram to Bengaluru or from Thiruvananthapuram to Sriharikota, they must pass through Tamil Nadu and will have to get quarantined.

A little bit of transportation is happening but not to the normal extent. We must also take care of the health of drivers, transporters and others involved.

A few foreign space agencies have slowly picked up their own launches. SpaceX has taken astronauts to the International Space Station. Do you see any of your launches on the horizon, now that lockdown restrictions have been relaxed?

We, too, are trying to do it with new strategies. For launch campaign activities at Sriharikota, there is a restriction on movement of people. We are seeing if some of these things can be done virtually.

All our systems are interlinked [across centres]. Before a launch, elaborate checks must be done on launch vehicle systems. A launch vehicle expert must travel from Thiruvananthapuram to the Sriharikota launch centre. Teams from Bengaluru, Thiruvananthapuram and Ahmedabad must also be there. Right now we are working on how to make it happen and what best we can do.

In the present conditions, can we transfer the data through secure network? Can our people assess the pre-launch situation at Sriharikota from Thiruvanthapuram itself? Which activities and how much can we do in a virtual mode? These are some possibilities we are exploring.

To what extent do you think the COVID-19 pandemic has hit your annual plan of missions? Sometime in March, GISAT-1 was to have been the first domestic launch of 2020 but it got deferred.

As I said before, all projects which require industry support are affected. Activities like satellite launch and making rockets available are affected. Not only for the SSLV, it could be Gaganyaan, Chandrayaan[-3] or every project. It is all interlinked. For a launch to take place, launchpad related activities at Sriharikota are done, not by the personnel there but by people from Thiruvananthapuram. Those teams are not able to travel. However, whether it SSLV, Gaganyaan or Chandrayaan[-3,] every in-house activity is going on without a problem

Do you plan to reshuffle your projects and bring any of the more important communication or Earth observation projects forward?

Again, I must say we are unable to say anything now. For each mission, certain conditions have to be there. [It also depends on when] we can resume and work out a method of doing certain activities in a virtual mode and how much of it we can do.

All missions are important. So many missions were planned from May onwards and now everything is put on hold. There is little we can do now. Only when it normalises can we plan and prioritise them.

Will austerity and cost cuts because of the pandemic limit your missions for the year?

That may not affect our missions because we always re-prioritise missions dynamically. It is mainly about procurement activities. Whatever we procure is for the long term, not for missions coming up tomorrow. So [re-prioritising] is like adjusting the whole thing and using it for immediate requirement. Therefore, it should not have an impact.

What activities are going on at key centres such as the URSC, VSSC, SAC?

Actually as Team ISRO we have been quite active and busy. At the centres, all developmental activities are going on everywhere, for example, work related to electric propulsion [for satellites], semicryogenic engine stage, design of an advanced satellite and many other activities.

(Note: U.R.Rao Satellite Centre URSC, Bengaluru, assembles satellites. Vikram Sarabhai Space Centre, thiruvanahthapuram, is the rocket and propulsion hub. Space Applications Centre, Ahmedabad, develops the critical satellite payloads.)

https://www.thehindu.com/news/national/projects-are-affected-with-industries-not-back-to-production-says-isro-chairman/article31926393.ece

ThePrint

Sat, 27 June 2020

Private sector can put Indian space mission into higher orbit. But ISRO must take it onboard

Private sector companies need access to ISRO's centres and labs for research and development activities in order to achieve their full potential

By Utkarsh Narain

With the announcement of IN-SPACe, the Narendra Modi government has opened the space sector for private participation in a big way. The Indian Space Research Organisation chairman K. Sivan Thursday welcomed the structural reforms in India's space ecosystem. Finance Minister Nirmala Sitharaman had last month hinted at giving private firms access to ISRO's facilities as part of the Aatma Nirbhar Bharat special economic package.

ISRO's scientists prepare for a launch at Satish Dhawan Space Centre in Sriharikota | ISRO | Twitter

An autonomous regulator

Sivan informed that an autonomous body IN-SPACe (Indian National Space Promotion and Authorisation Centre) would be established under the Department of Space (DoS) for permitting and regulating activities of the private space sector. This nodal entity would have its own independent directorates for technical, legal, safety and security, monitoring as well as activities promotion for assessing the private industry requirements and further coordinating the activities.

At theTakshashila Institution, we had argued about the need for an independent space regulator and drafted a space bill. An independent regulator such as IN-SPACe would pave the way for regulatory clarity, and reduce arbitrariness and discretion in the governance process.

Although India is late to the party when it comes to enabling the private sector and leveraging their skills, it still has an opportunity to learn from other countries' experiences. In the United States, one of the concerns of the private space sector is the multiplicity of regulatory bodies. Federal Aviation Administration (FAA)'s Office of Commercial Space Transportation (AST) is the nodal agency for licensing launches and re-entries; National Oceanic and Atmospheric Administration's (NOAA) approval is required for commercial remote-sensing satellites; and the Federal Communications Commission (FCC) deals with frequency issues related to commercial communications satellites. India has an opportunity to leapfrog into a system that can provide smooth, single-window clearances. Lessons from the experience of establishing independent regulators in telecom, civil aviation and insurance would also come in handy.

That the IN-SPACe board would have representations from the government, academia, and industry reflects the holistic nature of the reform. However, it will also help if the board has members from ministries such as telecom and defence, so that activities such as frequency allocation and orbital slot allotment, which require international liaising and coordination, can be accomplished efficiently. This will ensure that the private sector has a single point of contact with the government for all its regulatory requirements. A board composed of multiple, diverse stakeholders is critical and its composition would be eagerly anticipated by the ecosystem as the new body takes shape.

Hiving off routine functions

ISRO's original mandate was to conduct cutting-edge research on frontier space science and technology, and develop space assets of national importance. While ISRO continues to break barriers, over the past few years, it has become increasingly involved in operational activities such as commercial launches, production of satellites based on legacy technology, and space-based services.

Meanwhile, a nascent private sector in India has come up in the past 10 years across the space value chain that can share some of ISRO's load. Started by dynamic, young entrepreneurs who are trained at the best institutes and facilities from around the world, these startups aim to be partners and not contractors to ISRO. However, India's share of the pie in the global space business is still minuscule. Hence, institutional support and guidance in the form of steps such as opening up of ISRO's centres and labs for research and development (R&D) activities are required for these private companies to reach the potential they exhibit.

The ISRO chairman said that NewSpace India Ltd. (NSIL) would be re-defined from a "supply-driven model to demand driven model for space-based services." NSIL would be strengthened to "off-load operational activities of ISRO in the areas of launch vehicle & satellite production, launch services as well as space-based services" and execute these activities through industry consortiums.

This is largely a step in the right direction for three reasons. First, it would free up the resources for ISRO to focus on R&D. Second, this model of execution would increase industry participation, creating economic value and more jobs in the sector. Third, the government can choose to gradually disinvest from the public sector undertaking NSIL. This would help the government generate revenue. Moreover, it would make NSIL accountable to its shareholders, thus creating incentives for efficient management of the company.

New policy framework

The ISRO chief also highlighted the need for a new navigation policy and changes in the 2011 Remote Sensing Data Policy and the 1997 SATCOM policy. These policies have become dated and no longer represent the realities or fulfil the requirements of the sector.

The Draft Space Activities Bill of 2017, too, was inadequate and proposed broad-brush regulations for all space activities in the value chain. At this stage of India's space journey, we need a comprehensive policy document that understands the specific technical, safety, and environmental risks and benefits associated with different space activities, and proposes soft-touch regulation that can mitigate the risks and maximise the benefits. A parliamentary sanction through the passage of a space bill would codify the intent and create a predictable policy environment.

The Modi government's announcement of IN-SPACe is a step towards providing a level-playing field to India's private players. India needs to keep the foot on the pedal to take advantage of the skills in the private sector and for ISRO to achieve its space dream.

(Utkarsh Narain @utkarsh01 is a research analyst in the technology policy vertical at the Takshashila Institution in Bengaluru. Views are personal.)

https://theprint.in/opinion/private-sector-can-put-indian-space-mission-into-higher-orbit-but-isro-must-take-it-onboard/448937/

The Indian EXPRESS

Sat, 27 June 2020

IN-SPACe explained: what it means to the future of space exploration

Government has announced a new organisation, IN-SPACe, part of reforms to increase private participation in the space sector. A look at its objectives, and what it means to the future of space exploration

By Amitabh Sinha

Pune: The government on Wednesday approved the creation of a new organisation to ensure greater private participation in India's space activities, a decision which it described as "historic", and which Indian Space Research Organisation (ISRO) chairman K Sivan said was part of an important set of reforms to open up the space sector and make space-based applications and services more widely accessible to everyone.

The new Indian National Space Promotion and Authorisation Centre (IN-SPACe), which is expected to be functional within six months, will assess the needs and demands of private players, including educational and research institutions, and, explore ways to accommodate these requirements in consultation with ISRO. Existing ISRO infrastructure, both ground- and space-based, scientific and technical resources, and even data are planned to be made accessible to interested parties to enable them to carry out their space-related activities.

Why private participants

It is not that there is no private industry involvement in India's space sector. In fact, a large part of manufacturing and fabrication of rockets and satellites now happens in the private sector. There is an increasing participation of research institutions as well. But as Sivan told this newspaper on Thursday, Indian industry had a barely three per cent share in a rapidly growing global space economy which was already worth at least $360 billion. Only two per cent of this market was for rocket and satellite launch services, which require fairly large infrastructure and heavy investment. The remaining 95 per cent related to satellite-based services, and ground-based systems.

Indian industry, however, is unable to compete, because till now its role has been mainly that of suppliers of components and sub-systems. Indian industries do not have the resources or the technology to undertake independent space projects of the kind that US companies such as SpaceX have been doing, or provide space-based services.

Additionally, the demand for space-based applications and services is growing even within India, and ISRO is unable to cater to this. The need for satellite data, imageries and space technology now cuts across sectors, from weather to agriculture to transport to urban development, and more. As Sivan told this newspaper, ISRO would have to be expanded 10 times the current level to meet all the demand that is arising.

At the same time, there were several Indian companies waiting for make use of these opportunities. Sivan said there were a few companies that were in the process of developing their own launch vehicles, the rockets like ISRO's PSLV that carry the satellites and other payloads into space, and ISRO would like to help them do that. Right now, all launches from India happen on ISRO rockets, the different versions of PSLV and GSLV. Sivan said ISRO was ready to provide all its facilities to private players whose projects had been approved by IN-SPACe. Private companies, if they wanted, could even build their own launchpad within the Sriharikota launch station, and ISRO would provide the necessary land for that, he said.

IN-SPACe is supposed to be a facilitator, and also a regulator. It will act as an interface between ISRO and private parties, and assess how best to utilise India's space resources and increase space-based activities.

How ISRO gains

There are two main reasons why enhanced private involvement in the space sector seems important. One is commercial, and the other strategic. Of course, there is need for greater dissemination of space technologies, better utilisation of space resources, and increased requirement of space-based services. And ISRO seems unable to satisfy this need on its own.

The private industry will also free up ISRO to concentrate on science, research and development, interplanetary exploration and strategic launches. Right now, too much of ISRO's resources is consumed by routine activities that delay its more strategic objectives. There is no reason why ISRO alone should be launching weather or communication satellites. The world over, an increasing number of private players are taking over this activity for commercial benefits. ISRO, like NASA, is essentially a scientific organisation whose main objective is exploration of space and carrying out scientific missions. There are a number of ambitious space missions lined up in the coming years, including a mission to observe the Sun, a mission to the Moon, a human spaceflight, and then, possibly, a human landing on the Moon.

And it is not that private players will wean away the revenues that ISRO gets through commercial launches. As Sivan said, the space-based economy is expected to "explode" in the next few years, even in India, and there would be more than enough for all. In addition, ISRO can earn some money by making its facilities and data available to private players.

Beyond IN-SPACe

IN-SPACe is the second space organisation created by the government in the last two years. In the 2019 Budget, the government had announced the setting up of a New Space India Limited (NSIL), a public sector company that would serve as a marketing arm of ISRO. Its main purpose is to market the technologies developed by ISRO and bring it more clients that need space-based services.

That role, incidentally, was already being performed by Antrix Corporation, another PSU working under the Department of Space, and which still exists. It is still not very clear why there was a need for another organisation with overlapping function.

On Wednesday, however, the government said it was redefining the role of NSIL so that it would have a demand-driven approach rather than the current supply-driven strategy. Essentially, what that means is that instead of just marketing what ISRO has to offer, NSIL would listen to the needs of the clients and ask ISRO to fulfil those. This change in NSIL's role, Sivan said, was also part of the reforms that have been initiated in the space sector.

https://indianexpress.com/article/explained/in-space-india-space-missions-private-participation-isro-6476532/

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THE FINANCIAL EXPRESS

Sat, 27 June 2020

India opens space sector to private players: What it means for ISRO

The Union Cabinet on Wednesday allowed private companies to participate in India's space sector. How ISRO will gain from this move

In a historic decision, the Union government on Wednesday opened India's space programmes to private players. The Union Cabinet, headed by Prime Minister Narendra Modi, approved private sector participation in the entire range of space activities. "This will unlock India's potential in the space sector," said Union minister Jitendra Singh, while announcing the decision.

The Cabinet approved the newly formed Indian National Space Promotion and Authorization Centre (IN-SPACe), which will act as an arm of the Indian Space Research Organisation (ISRO). IN-SPACe, which will be functional in six months, will provide "a level playing field" to private companies in the country's space programmes, said minister Jitendra Singh. Though policies and good regulatory practices, IN-SPACe, in consultation with ISRO, will also guide and promote the private companies in their endeavour in space activities after assessing their needs and demands.

Private players are also allowed to use ISRO's infrastructure, scientific and technical resources, and even data for their space programmes.

Private players in Indian space programmes: Until now there was limited participation from private industries in India's space sector. It was restricted mainly to the manufacturing and fabrication of rockets and satellites. There is some, of late increasing, involvement from research institutes also. However, private participation is still very low. According to ISRO chairman K Sivan, as reported by the Indian Express, Indian industry accounts for a mere 3% in the rising $360-billion global space market. Rockets and satellite launch accounts for just 2% of it. Programmes like satellite-based services and ground-based system control the rest of the market.

So far, Indian private companies were unable to compete because their roles have been limited mainly to supply component and sub-systems. Even they lack resources and technology to handle independent space programmes the way companies like SpaceX in the US have been doing.

ISRO alone can't cater to the rising demand for space-based applications and services within India as it's growing rapidly.

Almost every sector, starting from agriculture to transport, weather department and even urban development, to name a few, now wants satellite data and imageries and space technology to draw their future strategy and grow business. According to Sivan, ISRO would have to increase its present size by 10 times to cater to the growing demand within India.

Many Indian companies have earlier envisaged their interest in Indian space programmes. Experts say they would grab this opportunity in both hands. There are few companies who are in the process of developing their own launch vehicles and rockets like that of ISRO's PSLV, which carry the satellites into space. Sivan said "ISRO would like to help them" in their endeavours.

India currently conducts all its launches on ISRO rockets—different versions of PSLV and GSLV. Sivan told The Indian Express that ISRO is ready to provide all its facilities to private players and support their space-related projects, which are approved by IN-SPACe. He said ISRO, if necessary, would even provide land to private players if they want to set up their own launchpad inside the ISRO's Sriharikota launch station.

According to the cabinet statement, IN-SPACe will act as a facilitator and also a regulator. The newly created centre will be an interface between ISRO and private players to facilitate the best use of resources.

ISRO will focus more on research and development activities, new technologies, exploration missions and human spaceflight programme, said the cabinet note. Right now a lot of ISRO's

resources are being consumed by routine activities, which is causing a delay in its strategic objectives. So many private companies across the world are engaged with space activities like launching weather and communication satellites. If private companies take over these activities, organisations like ISRO and NASA can more focus on space exploration by carrying out scientific missions.

https://www.financialexpress.com/lifestyle/science/india-opens-space-sector-to-private-players-what-it-means-for-isro/2005105/

EurekAlert!

Sat, 27 June 2020

Developing new techniques to improve atomic force microscopy

Researchers at the Beckman Institute for Advanced Science and Technology have developed a new method to improve the detection ability of nanoscale chemical imaging using atomic force microscopy. These improvements reduce the noise that is associated with the microscope, increasing the precision and range of samples that can be studied.

The study "Closed-Loop Atomic Force Microscopy-Infrared Spectroscopic Imaging for Nanoscale Molecular Characterization" was published in *Nature Communications*.

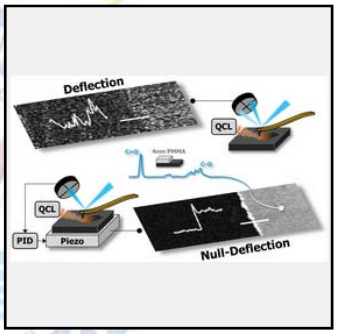


Image: Chemical signal produced by a 4 nm thick polymer film collected using previous deflection AFM-IR detection, top, compared to the new null-deflection approach.

Atomic force microscopy is used to scan the surfaces of materials to generate an image of their height but the technique cannot easily identify the molecular composition. Researchers have previously developed a combination of AFM and infrared spectroscopy called AFM-IR. The AFM-IR microscope uses a cantilever, which is a beam that is connected to a support at one end and a sharp tip at the other, to measure subtle movements of the sample introduced by shining an IR laser. The absorption of light by the sample causes it to expand and deflect the cantilever, generating an IR signal.

"Although the technique is widely used, there is a limit to its performance," said Rohit Bhargava, a Founder Professor of Engineering and the director of the Cancer Center at the University of Illinois at Urbana-Champaign. "The problem is that there were unknown sources of noise that limited the quality of the data."

The researchers created a theoretical model to understand how the instrument works and therefore identify the sources of noise. Additionally, they developed a new way to detect the IR signal with improved precision.

"The cantilever deflection is susceptible to noise which becomes worse as the deflection increases," said Seth Kenkel, a graduate student in the Chemical Imaging and Structures Laboratory, which is led by Bhargava. "Instead of detecting cantilever deflection, we used a piezo component as a stage to maintain zero deflection. By applying a voltage to the piezo material, we can maintain small deflection with low noise while recording the same chemical information which is now encoded in the piezo voltage."

Instead of moving the cantilever, the researchers use the movement of the piezo crystal to record the IR signal. "This is the first time anyone has controlled a piezo actuator to detect the signal. Other researchers work around challenges such as noise by using more complex detection systems that don't address the underlying problems associated with AFM-IR," Kenkel said.

"People have only been able to use this technique to measure samples that have a strong signal because of the noise problem," Bhargava said. "With the improved sensitivity, we can image a much smaller volume of samples, like cell membranes."

In addition to measuring more diverse samples, the researchers also hope to use this technique to measure smaller sample volumes. "We could use this technique to look at complex mixtures that are present in small volumes, like a single lipid bilayer," Bhargava said.

"The new technique developed by the Bhargava lab is exciting. Our group is interested in using this technique immediately to learn about protein deformation on complex surfaces," said Catherine Murphy, the head of the Department of Chemistry and the Larry Faulkner Endowed Chair in Chemistry.

The research was partially supported by the National Science Foundation through the U of I Materials Research Science and Engineering Center DMR-1720633 and the National Institute of Biomedical Imaging and Bioengineering of the National Institutes of Health under Award Number T32EB019944.

Editor's note: The study "Closed-Loop Atomic Force Microscopy-Infrared Spectroscopic Imaging for Nanoscale Molecular Characterization" can be found at http://doi.org/10.1038/s41467-020-17043-5.

https://www.eurekalert.org/pub_releases/2020-06/bifa-dnt062520.php

The National

Sat, 27 June 2020

Space researchers in Sharjah detect sunspot five times the size of Earth

Sunspots are the first indicators of solar eruptions, which can cause geomagnetic storms on Earth

By Sarwat Nasir

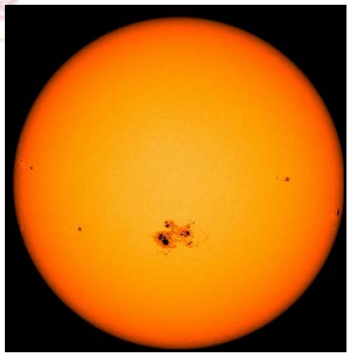
A gigantic sunspot five times the size of the Earth has been identified by astronomers in Sharjah.

Researchers at the Sharjah Academy of Astronomy, Space, Science and Technology detected the radio solar emission earlier this month.

Dr Ilias Fernini, deputy general director of the academy's Research Laboratories and Sharjah Observatory, described sunspots as dark blotches on the surface of the sun that are caused by increased magnetic activity.

They are the primary indicators of solar eruptions that lead to solar storms.

“We detected a sunspot which is five times the size of the Earth,” said Dr Fernini.



Sunspots detected in 2014. Courtesy: NASA

In 1989, the entire Quebec province in Canada faced a power outage because of a solar storm that heavily damaged their electricity grid.

The electrically charged particles from the storm were so strong they crossed through Earth’s magnetic field, causing Central and Northern Canada’s skies to light up with Aurora Borealis – or Northern Lights – for two full days, and became visible in places such as Honduras and Dominica.

Now, thanks to advances in technology, space researchers and scientists can monitor the sun throughout the day and more efficiently for any increased solar activity.

Space scientists and astronomers have been closely monitoring the sun, as it has entered its new 11-year cycle (Solar Cycle 25), which could cause it to be more active.

For the past several years it has been quiet, with very little solar activity.

“It all depends how strong the cycle is. We expect it to be at a maximum by 2022,” said Dr Fernini.

The sunspot detected was part of a family of sunspots that were flagged by US space agency Nasa on May 29.

Nasa’s Parker Solar Probe detected the solar flare, which was the largest discovered since October 2017.

Dr Fernini said that increased solar activity could affect the global climate in the long run.

He said the particles released from the solar flares can also impact human-built space objects.

“Sometimes when we receive highly charged particles, it may also affect our satellites. We survived them in 2003 when the sun was very active and it sent huge amounts of particles towards our planet,” said Dr Fernini.

He added that more than 28 satellites in low Earth orbit were damaged and two others were destroyed in the 2003 solar storms, also called ‘Halloween Storms’ due to their occurrence around the autumn celebration.

https://www.thenational.ae/uae/science/space-researchers-in-sharjah-detect-sunspot-five-times-the-size-of-earth-1.1039475

COVID-19 Research News

WGBH NEWS

Sat, 27 June 2020

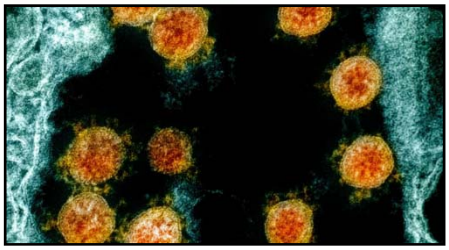
This Coronavirus doesn't change quickly, and that's good news for vaccine makers

By John Hamilton

Scientists are monitoring the virus that causes COVID-19 for genetic changes that could make a vaccine ineffective. But so far, they're not seeing any.

"There's nothing alarming about the way the coronavirus is mutating or the speed at which it's mutating," says Emma Hodcroft, a molecular epidemiologist at the University of Basel in Switzerland. "We don't think this will be a problem [for vaccines] in the short term."

"To date, there have been very few mutations observed," says Peter Thielen, a senior scientist at Johns Hopkins Applied Physics Laboratory. "And any mutations that we do see are likely not having an effect on the function of the virus itself."



Internationally, scientists now have on file the genomes of more than 47,000 different samples of the virus that causes COVID-19 — up from just one in January. Here's a transmission electron micrograph of SARS-CoV-2 virus particles (orange) isolated from a patient.

That's good news for scientists working to produce an effective vaccine by the end of the year. And it reflects the enormous quantity of genetic information on SARS-CoV-2, the virus that causes COVID-19, that researchers have amassed since the virus appeared in China late last year.

In January, scientists were limited to just one whole genome sequence of the virus. "Today we have over 47,000 coronavirus genomes that have been submitted to international databases," Thielen says.

New genomes are added every day by teams of scientists from around the world. And each time a new one arrives, it gets a close examination, Thielen says.

"What we're looking for in the data is similarity between the virus that first emerged and the genome that had been deposited and any changes that have occurred in the virus," he says. And overall, the viruses circulating today look remarkably similar to the ones first identified in China.

There had been concern about mutations because SARS-CoV-2 is a type of virus capable of quickly changing its genes. But unlike many similar viruses, the coronavirus uses a proofreading system to catch any errors in the genetic code when it begins generating copies of itself.

"So if there's a change, it will actually make a correction at a specific location," Thielen says.

Vaccine developers have been especially concerned about genetic locations that affect something called a spike protein. It's a structure on the surface of the coronavirus that allows it to invade cells.

Spike proteins also give the virus its distinctive appearance and account for its name. Scientists who first viewed a coronavirus through an electron microscope were reminded of the solar corona.

The candidates for a coronavirus vaccine now under development are all designed to teach the immune system to recognize these spike proteins. So far, Thielen says, that's looking like a good strategy.

"The targets for vaccine design today remain the same as we would have designed them in January," he says.

Some other well-known viruses have proved less amenable to the strategy of using the same vaccine from year to year. Influenza, for example, is constantly altering its surface proteins in ways that require annual vaccine updates for each strain that's making the rounds that year.

"Flu just really loves to change these parts," Hodcroft says. "And that's why we can end up with such different flus from season to season."

Measles represents a virus at the other extreme – its genome has stayed fairly consistent over the years, at least in the ways that trigger immunity in people after infection. That means children today still get a measles vaccine that was developed in the 1960s, and it provides immunity for a lifetime.

Hodcroft says she thinks SARS-CoV-2 is likely to fall somewhere between the flu and measles when it comes to making a vaccine.

"I think in the short term we'll find something," she says. "The big question is whether this is something we'll be able to vaccinate once and then you never have to get it again, or will it be something you'll have to get every couple of years to keep your immunity up to date."

Scientists are uncertain because the coronavirus is still so new, Hodcroft says.

"We haven't really seen the full diversity of how the virus can mutate," she says. "It gathers mutations over time. We can't speed up time, so we just have to wait and see."

At the moment, though, vaccine developers have more pressing concerns than mutations. First, they'll have to demonstrate that they can produce vaccines that are both safe and effective. Then they'll have to make huge quantities.

"It's not a small feat to manufacture a vaccine for billions of people and then to get it to all of those people," Hodcroft says.

That will take months, she says, in addition to the months required to develop a vaccine in the first place.

https://www.wgbh.org/news/science-and-technology/2020/06/26/this-coronavirus-doesnt-change-quickly-and-thats-good-news-for-vaccine-makers

BUSINESS INSIDER INDIA

Sat, 27 June 2020

Preliminary study finds more than 100 severe COVID-19 patients developed brain conditions like stroke and psychosis

By Mia Jankowicz

- ***A preliminary study has identified brain conditions such as strokes and psychosis in some patients hospitalized with bad cases of COVID-19.***
- ***The study, published in The Lancet Psychiatry, is the first systematic review of suspected brain complications since the coronavirus swept the world, its authors said.***
- ***The study was small and may show only a correlation between the conditions. But researchers said it provided important data for future research.***

A preliminary study has found evidence of brain complications such as strokes and psychosis in patients with severe cases of COVID-19, causing scientists to call for more research into the topic.

Researchers reviewed data from patients hospitalized with COVID-19 across the UK in April, when the country was experiencing a sustained peak in reported infections.

They found that neurological and psychiatric conditions associated with COVID-19 appeared to rise in tandem with the country's rise in coronavirus cases.

The study, published in the British medical journal The Lancet Psychiatry, was small in scale, looking at 153 cases in total.

The researchers examined only cases they already knew involved brain problems and did not seek to establish how prevalent such conditions were in COVID-19 patients as a whole.

Nonetheless, the researchers said the data was valuable and called for more research on the topic.

The study examined 125 cases in detail. Of those, 77 patients had strokes, and 39 had altered mental states such as confusion or psychiatric conditions.

The researchers noted that some of these could have existed before the patients contracted COVID-19 but gone undiagnosed. Though most cases of strokes and psychosis were in older people, younger patients were "disproportionately overrepresented" in their sample, the scientists wrote.

Brain complications have been reported as a concern since the first emergence of the virus in China, the study said. But the authors said their paper was the first systematic review of the topic.

"There have been growing reports of an association between COVID-19 infection and possible neurological or psychiatric complications, but until now these have typically been limited to studies of 10 patients or fewer," the lead author, Benedict Michael, a senior clinician scientist fellow at the University of Liverpool, told The Guardian.

He added that it was still important to note the study had looked solely at serious cases that required hospitalization.

Michael Sharpe, a professor of psychological medicine at the University of Oxford, told The Guardian that the cases were "striking."

He said, however, that scientists should not rule out the possibility that the cases were unrelated and simply happening at the same time as the viral infection.

Sarah Pett, a University College London professor who helped lead the work, told Reuters the study was "an important snapshot of the brain-related complications of COVID-19 in hospitalized patients."

She continued: "It is critically important that we continue to collect this information to really understand this virus fully.

https://www.businessinsider.in/science/news/preliminary-study-finds-more-than-100-severe-covid-19-patients-developed-brain-conditions-like-stroke-and-psychosis/articleshow/76644542.cms

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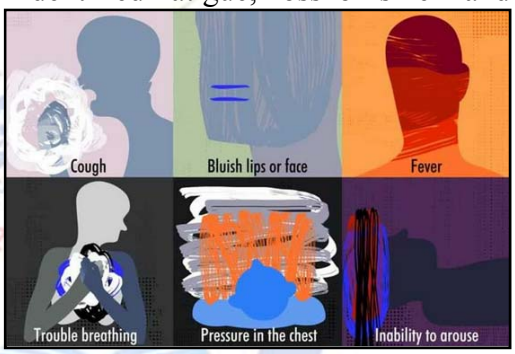
Cough, fever most prevalent symptoms of Covid-19: Study

A persistent cough and fever have been confirmed as the most prevalent symptoms of Covid-19, according to a major review of studies which identified fatigue, loss of smell and difficulty in breathing among other major symptoms

London: A persistent cough and fever have been confirmed as the most prevalent symptoms of Covid-19, according to a major review of studies which identified fatigue, loss of smell and difficulty in breathing among other major symptoms.



The study, published in the journal PLoS ONE, ratifies the list of symptoms listed by the World Health Organisation at the start of the pandemic.

The researchers, including those from the University of Leeds in the UK, combined data from 148 separate studies to identify the common symptoms experienced by over 24,000 patients from nine countries, including the UK, China and the US.

The researchers said the study is one of the biggest reviews ever conducted into COVID-19 symptoms.

They acknowledged that there is likely to be a large proportion of people who had the virus but did not display symptoms.

“This analysis confirms that a cough and fever were the most common symptoms in people who tested positive with Covid-19,” Ryckie Wade, a surgeon and Clinical Research Fellow at the Leeds Institute of Medical Research, said.

“This is important because it ensures that people who are symptomatic can be quarantined, so they are not infecting others,” Wade said.

Of the 24,410 cases, the study found 78 per cent had a fever, the researchers said.

As many as 57 per cent reported a cough, which varied across countries, with 76 per cent of patients reporting a cough in the Netherlands compared to 18 per cent in South Korea, they said.

Nearly 31 per cent said they had suffered fatigue, 25 per cent lost the ability to smell, while 23 per cent reported difficulty breathing, according to the researchers.

They believe the variation in the prevalence of symptoms between countries is due, in part, to the way data was collected.

The researchers found that of those patients who needed hospital treatment, 17 per cent needed non-invasive help with their breathing, and 19 per cent had to be looked after in an intensive care unit.

Nine per cent patients required invasive ventilation and two per cent needed an artificial lung, they said.

(This story has been published from a wire agency feed without modifications to the text. Only the headline has been changed.)

https://www.hindustantimes.com/health/cough-fever-most-prevalent-symptoms-of-covid-19-study/story-hjhqNWKxC2dJuV8ArDlTuO.html