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समाचार पत्रों से चयित अंश Newspapers Clippings

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Explained: The Covid-19 hospital in Delhi that came up in just 12 days

DRDO has built the Sardar Vallabhbhai Patel COVID Hospital, a temporary 1,000-bed medical centre spread over 25,000 sq m of Indian Air Force land in Delhi. The hospital is open to anyone who has Covid-19, and treatment is free

By Ananya Tiwari

The Sardar Vallabhbhai Patel COVID Hospital, a temporary 1,000-bed medical centre spread over 25,000 sq metres of Indian Air Force land on Ulan Batar Marg near Delhi airport's domestic terminal T1, opened its doors to patients on Thursday (July 9) evening.

The Defence Research and Development Organisation (DRDO) has built the facility – which was formally inaugurated on July 5 – from scratch in just 12 days. Also involved in building the hospital were the Union Home and Health Ministries, and Tata Sons, the holding company of the Tata Group. Funding has come from a clutch of companies as well as DRDO employees, who contributed a



day's salary, the Home Ministry has said in a release.

The hospital's 250 ICU beds will boost Delhi's ICU bed capacity by 11 per cent. On the day of the inauguration, Delhi Chief Minister Arvind Kejriwal had said, "For now, there is no scarcity of hospital beds, we have over 15,000 beds out of which 5,300 are occupied. There is a paucity of ICU beds. If there is any spike in Covid cases, these ICU beds will be extremely critical for us."

A total 146 doctors will be working at the hospital. (Express Photo: Tashi Tobgyal)

Who can be admitted to the hospital?

Anyone can. "We are open to any Covid-19 positive patient, as long as they have a test report. The patients can be referred by the district administration. But they can also arrive at the facility on their own, as long as they have a test report." Major General S S Bhatia, Additional DG, Armed Forces Medical Services (AFMS), said.

No patients had, however, been admitted to the hospital until Friday.

What will it cost to receive treatment at the hospital?

All medical treatment at the hospital will be free for patients.

How many medical personnel will be working at the hospital?

A total 146 doctors will be working at the hospital. They will be from the Directorate General Armed Forces Medical Services (DGAFMS) as well as from the Armed Forces Medical College (AFMC) in Pune. There will be approximately 50 nursing staff, also from AFMC, and paramedical and support staff.

“They will in all probability work in three shifts,” Maj Gen Bhatia said. “There is a well-defined area in the premises where they will be doffing and donning the PPE, as well as separate dining and accommodation areas for on-duty staff.”

Can a patient get a RT-PCR test in the facility?

“Yes, they can,” Maj Gen Bhatia said. “We will collect the samples of the patient and send it to the Defence Institute of Physiology and Allied Sciences, which will conduct the test. The result will be given in a few hours’ time,” he said.

The tests, like the treatment, will be free.

Is the facility attached to a referral hospital?

Since any patient can arrive at the hospital for treatment, provided they are Covid-19 patients, there is no referral hospital connected with the facility.

“If, however, any patient who is admitted needs special, advanced treatment, such as dialysis, they will be referred to the All India Institute of Medical Sciences,” Maj Gen Bhatia said.

Who designed and built the hospital?

The design and planning of the facility was done by DRDO in consultation with the DGAFMS. This took three days, after which work on building the hospital began on June 24.

The hospital is a temporary structure, which has 4 main hangars with 250 beds each. One hangar is reserved for the ICU – it is named Shaheed Col. B Santosh Babu ICU Ward after the Army officer who lost his life along with 19 others in the clash with Chinese soldiers in Galwan, Ladakh. The ICU has 250 ventilator beds.

Each of the wards are connected via an internal concrete pathway. The other general wards are named after other fallen soldiers – Shaheed Nb Sub Satnam Singh Medical Ward, Shaheed Nb Sub Nuduram Soren and Shaheed Nb Sub Mandeep Singh Medical Ward.

There are two toilet blocks, with one toilet and one bathroom unit for every nine patients.

There is a separate Doctors’ Block, and a hangar to accommodate on-duty medical staff.

There is a reception and triage area where patients will be received.

There is also a morgue with a capacity of 10 bodies. Dr K Radhakrishnan, Chief Construction Engineer (R&D), DRDO said, “We asked the DGAFMS, and they said that the fatalities in a hospital with 250 ICU beds will be low. And we will evacuate the dead bodies quickly as well.”

What materials were used in the construction?

The frames are prefabricated materials made of aluminium alloy, and the sheet is a poly-elastic material, which is fire-resistant. Both have been imported from Germany.

Dr Radhakrishnan said, “These structures are already fabricated and readymade, and we need to just bring it and erect it. They are rapidly constructed.” The structure is flexible and can withstand a regular earthquake.

The cubicles are made of octanorm partitions, which is a material used for temporary constructions.

Does the hospital have any special features?

One of the unique features of the hospital is the central air conditioning and internal negative pressure gradient, which ensures that the air is not re-circulated, possibly causing cross-infections, and is not allowed to leave the hangar.

There are circular air ducts with holes punctured in them passing through the hangars horizontally, and connected to blowers and ducts outside.

Dr Radhakrishnan said, “The system is such that the air inside, which may have the virus, is thrown out, allowing fresh air to always be present inside. This ensures there is no cross-contamination. Usually in hospitals, the air conditioning is such that the air is recirculated inside the wards.” The internal negative pressure gradient will ensure that air inside is not allowed to leave the hangars.

At the end of each ward are exhaust fans which will push out the contaminated air to a height of 9 metres. “As per WHO guidelines, if the air is released at a certain height, it dissipates into the atmosphere and is not harmful,” Dr Radhakrishnan said.

The facility also has a vertical cryogenic medical oxygen tank.

“Covid-19 causes a major issue in breathing, and when one is highly infected, oxygen becomes essential to survival. This tank has liquid oxygen enough for 1,000 patients for a period of 4-days,” Dr Radhakrishnan said.

The tank is connected to each ward through a pipeline system and there are kiosks around beds where an oxygen mask can be plugged in directly. “Usually, 100 per cent oxygen is not available. But we are providing that here,” said Dr Radhakrishnan.

Who has supplied the medical equipment in the hospital?

There are 250 ICU-ventilator beds in the hospital, each with a ventilator that has been procured by the DRDO through the PM-CARES Fund. Some of the ventilators have been built by Bharat Electronics in collaboration with the DRDO; others by AgVa Tech.

All beds will have facilities for oxygen support. A dietician is present at the site to oversee the diets of the patients, including those with comorbidities such as diabetes or kidney ailments.

A pharmacy is being run by Apollo Pharmacy at the site.

There is a laboratory for basic pathology tests such as haematology tests, bio-chemistry tests and serology tests. Radiology tests such as X-Rays, ECG and ultrasounds can also be done.

Other equipment include incubators, urine analysers, electrolyte analysers and deep freezer.

Maj Gen Bhatia said: “The lab work has been outsourced to a third-party called CD Diagnostics, as per an agreement with the DRDO.”

DRDO-developed or procured decontamination tunnels, PPEs, N95 masks, contact-free sanitiser dispensers, sanitisation chambers and four medical robot trolleys will be used at the facility. The trolleys are remote-controlled and can transport food and medicines, as well as offer video-chat services to patients from a distance.

What will be the source of power for the hospital?

When the hospital is functioning at full capacity, with all its AC systems and ventilators, it will require 5.5 MW of power, Dr Radhakrishnan said. Power will be supplied by the Military Engineer Services (MES), which provides engineering support including electricity services to the Indian Armed Forces.

To ensure that the ICU ward does not face any power cuts, it is being connected to a UPS system for back-up supply. Maj Gen Bhatia said: “Ventilators have two hours of separate power back up, but we don’t want the situation in which only ventilators are working. We cannot rely totally on our generator either. The UPS gives uninterrupted power supply.”

What about waste management?

Biomedical waste from the facility shall be disposed of as per protocol.

A sewage treatment plant on the site will treat the water from the toilets. Dr Radhakrishnan said, “We were concerned about the sewage. To save time, we took existing steel tanks, made partitions in them, and connected them together. The water is treated with UV and chlorinated. The treated water can be used in a garden or it can just be let out.”

The DRDO also procured water pipelines from the Delhi Jal Board for the hospital.

What will happen to the facility once the pandemic is over?

Maj Gen Bhatia said, “This structure is temporary, and can be utilised for other purposes. The equipment is from DRDO and the PM CARES fund and can be given to hospitals that need them.”

<https://indianexpress.com/article/explained/new-delhi-sardar-vallabhbhai-patel-covid-hospital-6500177/>



Fri, 10 July 2020

DRDO manufactures a machine that can potentially kill the dangerous coronavirus

By Neel Raju Nalawade

Coronavirus cases in India are rising every day. Till now thousands of people have lost their lives due to the deadly virus. Now, scientists are even claiming that the virus has the potential to spread through respiratory droplets in the air. According to recent Union Health Ministry reports, India's coronavirus cases mounted to 7,42,417 on Wednesday with a single-day rise of 22,752 infections and 482 new deaths. However, the recovery rate has also certainly improved to over 61.5 per cent.

After observing the spike of COVID-19 cases, DRDO (Defence Research and Development Organisation) manufactured a machine which can kill coronavirus within ten minutes. This Coronavirus defender machine has UV Rays which are able to kill Covid-19 infection. The manufactures claim that this machine will act as a protective shell to help the citizens protect themselves from the infection.

<https://www.zee5.com/zeekannada/drdo-manufactures-a-machine-that-can-potentially-kill-the-dangerous-coronavirus/>



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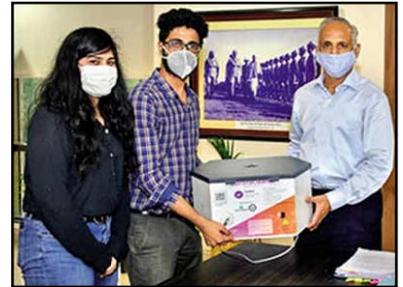
Delhi: IIT graduates make 'corona cleaner' device for cops

By Somreet Bhattacharya

New Delhi: Delhi Police on Thursday was presented with a device, named 'corona cleaner', that uses UV radiation to clean items like documents, office stationery and even weapons used by the cops on the frontlines. The device was developed by a group of IIT graduates in collaboration with Defence Research and Development Organisation (DRDO).

The device will be installed at the entrance of the Delhi Police headquarters. Police said that the device might be installed at other police stations if it is found to be effective.

Shubham Rathore, one of the developers, said that it is an alternative to ineffective Chinese products that are already available in the market. "We started developing the device while working with another project with DRDO. On analysing the Chinese products in the market, we found that they had no UV emitting devices fitted in them, rather they had LED lamps with a violet hue that did not serve any purpose," said Rathore. The device, presented to police commissioner S N Shrivastava, consists of a container that is fitted with four UV emitting spectrometers. Items can be placed inside it for disinfection by UV rays. "We got



the device tested by the DRDO, who gave us a certification that the UV rays generated by our device can kill 99.99% of the virus,” said Rathore. Each unit costs around Rs 7,000.

At present, Delhi Police sprays sanitisers on personal belongings of visitors entering the police premises, which are alcohol or water based and can't be sprayed on electronic items.

<https://timesofindia.indiatimes.com/city/delhi/iit-grads-make-corona-cleaner-device-for-cops/articleshow/76901933.cms>

DRDO Technology News



DEFENCE AVIATION POST

Your Connect To The World Of Defence And Aviation

Sat, 11 July 2020

Will be Atmanirbhar in missile systems in 4 years: Bharat Dynamics

The government had announced reforms in defence production as part of the Rs 20 lakh crore stimulus package announced to revive a pandemic-shuttered economy. The government additionally unveiled a slew of measures for the defence sector in the “Atmanirbhar Bharat” package.

ET NOW spoke to the management of Bharat Dynamics, India's only missile manufacturing company, that makes the surface to air missiles, anti-tank guided missiles, torpedoes and underwater weapons among systems, to understand the defence manufacturing opportunity for the country and plans to make India's defence sector *Atmanirbhar* (self-reliant).



Commodore Siddharth Mishra (Retd) CMD, Bharat Dynamics lauded the government's efforts for policy changes within the defence sector. “The government has been providing major support,” he said.

Mishra mentioned that in missile systems, India shall be Atmanirbhar in 4 years. He mentioned that the Defence Ministry had approved Astra Missile for exports. “We have been working on global reach and have two contracts for underwater weapons. We are eyeing Export Opportunities for Akash Missile. We plan to use the foreign office for export to various countries. We have signed an MoU with Russia for strategic parts.”

The company is eyeing the European Market for exporting defence equipment. The company will likely see ‘Astra’- the first Beyond Visual Range, Air-to-Air Missile order by the end of the year according to Commodore Mishra.

The company recently signed License Agreement and Transfer of Technology with DRDO (DRDL) for Akash Missile Weapon System (Indian Army Variant). The company also signed MoU with IIT Hyderabad to upgrade its equipment and said the DRDO (Defence Research and Development Organisation) is developing several indigenous missiles.

<https://www.defenceaviationpost.com/2020/07/will-be-atmanirbhar-in-missile-systems-in-4-years-bharat-dynamics/>



Sat, 11 July 2020

HAL's LCH continues to remain “Toothless” but things might change

In 2017, Then Indian army chief General Bipin Rawat had said Indigenous Attack/combat helicopters HAL Rudra and HAL Light Combat Helicopter have major shortcomings, that is in their current configuration both do not have suitable anti-tank guided missile (ATGM), which is the main weapon of any Attack/Combat helicopters around the world.

Fast forward to 2020 and nothing much has changed since then as HAL Rudra MkIV and LCH Helicopters continue to be armed only with French Nexter 20mm turret gun and Belgian 70 mm rockets and waits for ATGM to be used as effective anti-armor, anti-bunker and anti-fortification role for the Strike Corps.



DRDO developed Helina and SANT anti-tank guided missile system was supposed to provide lethal aerial firepower against the armored thrust of the rivals but DRDO has not been able to clear this trial phase of this missiles and enter production. DRDO officials have claimed both the missiles are ready for production and have cleared all trials but there seem to be some bottleneck issues with the production of the missile which is yet to resolve.

Army already has 60 HAL Rudra MkIV and the chorus has been growing to induct HAL developed LCH also and it seems, Army will clear that proposal to induct 10 LCH and 5 for Air force soon, but both Helicopters will continue to come without any decent ATGM integrated into them. Army has been proposing the integration of American AGM-114 Hellfire air-to-surface missile (ASM) and buys interim stock for both HAL Rudra and LCH fleet but it has some opposition from DRDO which claims its Army which is delaying ordering locally developed Helina and SANT anti-tank guided missile system over imported ATGM.

Army also has been offered helo-launched Spike ER and the MBDA PARS L3 anti-tank guided missile from other foreign vendors but turf war is yet to be resolved between Army and DRDO due to which one of the main weapon systems for Gunship Helicopters are still missing but sources close to idrw.org has confirmed that talks are underway to keep both Army and DRDO happy and a deal to arm this gunships with ATGM will be cleared by end of this year

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<https://idrw.org/hals-lch-continues-to-remain-toothless-but-things-might-change/#more-230696>



Sat, 11 July 2020

S Korea's First KF-X prototype Fuselage breaks cover, Is India too late to join 5th Gen brigade?

By Jatin Ram

South Korean aerospace and defense company Korea Aerospace Industries (KAI) issued an image of the first KF-X fuselage, which is undergoing assembly in the company's Sacheon factory. KAI says that the prototype of its Korean Fighter Experimental (KF-X) multirole fighter aircraft will be rolled out in April 2021 with the first flight planned in 2022.

The first mass-produced KF-X aircraft, which comes in Block 1, between 2026 and 2028 will be equipped with limited air-to-ground weapons in addition to air-to-air weapons and No Internal Weapons Bay and slowly in the Block 2 KF-Xs, which will be series-produced from 2029, will come to a host of 5th generation fighter capable of performing full air-to-air and air-to-ground combat missions.



Speed and sensible block upgrade methods suggest that both South Korea and co-developer Indonesia have rather adopted block upgrades to achieve 5th generation technology.

India has adopted similar block upgrades to the 5th generation fighter jet but India's AMCA program is yet to officially take off as delays and timelines keep shifting in the program. The KF-X and AMCA have similar characteristics, including the fact that both aircraft will be powered by two US-built F414 jet engines. The KF-X and AMCA also have a loaded weight of around 25 tonnes each and will be capable of carrying weapons and equipment both internally and externally.

Additional fighter jet programs like TEDBF and Tejas Mk2 too have been prioritized over AMCA program which could be due to lack of skilled manpower and allocation of the budget which could make India last country to join the 5th generation brigade while countries like China and Russia have already developed 5th generation fighter jets, while the United States already has its second 5th generation fighter jet in production and countries like Japan and South Korea already progressing from drawing board stage to prototype stage

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<https://idrw.org/s-koreas-first-kf-x-prototype-fuselage-breaks-cover-is-india-too-late-to-join-5th-gen-brigade/#more-230723>

THE TIMES OF INDIA

Sat, 11 July 2020

Defence minister Rajnath Singh reviews situation in eastern Ladakh

New Delhi: Defence minister Rajnath Singh on Friday carried out a comprehensive review of the situation in eastern Ladakh with top military brass in view of the withdrawal of troops from the friction points by China's Peoples Liberation Army, government sources said.

The defence minister carried out the review at a meeting with Chief of Defence Staff Gen Bipin Rawat, Army Chief Gen MM Naravane, Navy Chief Admiral Karambir Singh and Air Chief Marshal RKS Bhadauria besides several other senior military officials.

Gen Naravane gave a detailed account of the implementation of the first phase of mutual disengagement of troops from Galwan Valley, Gogra, Hot Springs and Finger 4 areas in Pangong Tso, the sources said.

They said the Army chief apprised Singh about combat readiness of the Indian Army in the region to deal with any eventualities and presented a detailed update of situation in all the sensitive areas along the Line of Actual Control in eastern Ladakh as well as in Arunachal Pradesh, Uttarakhand and Sikkim.

As the first phase of the disengagement is nearing completion, government sources said the two sides are set to hold a fourth round of corps commander-level dialogue by early next week to finalise modalities for de-induction of troops amassed by both sides in their rear bases along the LAC, the de-facto border between the two countries.

Both sides have completed creation of a buffer zone of three kilometres in the three friction points of Galwan Valley, Gogra and Hot Springs as part of a temporary measure, they said, adding there has been thinning out of troops from Finger 4 area in Pangong Tso as well.

The disengagement of troops from the friction points formally kicked off on Monday following eight weeks of eyeball-to-eyeball confrontation between the two armies at multiple locations in eastern Ladakh.

The Indian and Chinese armies were locked in a bitter standoff in multiple locations in eastern Ladakh for the last eight weeks. The tension escalated manifold after a violent clash in Galwan Valley in which 20 Indian Army personnel were killed.

Both sides have held several rounds of diplomatic and military talks in the last few weeks to ease tension in the region.

<https://timesofindia.indiatimes.com/india/defence-minister-rajnath-singh-reviews-situation-in-eastern-ladakh/articleshow/76890296.cms>



Defence minister Rajnath Singh reviews situation in eastern Ladakh



Sat, 11 July 2020

Ladakh row figures in Rajnath's telephonic talks with US Defence Secretary

Defence Minister Rajnath Singh on Friday held a telephonic conversation with his US counterpart Mark T Esper during which India's border row with China in eastern Ladakh and the overall security scenario in the region figured prominently, people familiar with the development said.

Singh and Esper also deliberated on ways to further boost bilateral defence and security cooperation, they said, adding the telephonic conversation took place at the request of the US side. China's aggressive posturing along the Line of Actual Control in eastern Ladakh was discussed, and Singh apprised the US defence secretary about India's position on the row, they said.

"The two ministers have been in regular touch with each other. They have spoken several times on bilateral defence cooperation and issues of mutual interest. Today's conversation was in continuation of this exchange," said a source.

The Indian and Chinese armies were locked in a bitter standoff in multiple locations in eastern Ladakh for the last eight weeks. The tension escalated manifold after a violent clash in Galwan Valley in which 20 Indian Army personnel were killed.

In the last five days, Chinese military has withdrawn troops from three friction points in line with a disengagement understanding with Indian Army.

Both sides have held several rounds of diplomatic and military talks in the last few weeks to ease tension in the region.

https://idr.w.org/ladakh-row-figures-in-rajnaths-telephonic-talks-with-us-defence-secretary/#disqus_thread

DNA
DAILY NEWS & ANALYSIS

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Sat, 11 July 2020

Rajnath Singh discusses COVID-19 situation, defence cooperation with South Korean defence minister

Defence Minister Rajnath Singh on Friday spoke to his South Korean counterpart Jeong Kyeong-Doo over the phone

Edited By Abhiushek Sharma

Defence Minister Rajnath Singh on Friday spoke to his South Korean counterpart Jeong Kyeong-Doo over the phone and had discussions on issues pertaining to the COVID-19 pandemic situation and defence cooperation.

During the telephonic conversation, the ministers reviewed COVID-19 situation across that world, an official statement from the Defence Ministry said on Friday.

Singh informed Kyeong-Doo on India's contribution to international efforts against COVID-19 and discussed areas of mutual cooperation in the global fight against the pandemic.

The ministers finally agreed to work together to deal with the complex challenges posed by this pandemic.

The two leaders further discussed regional developments of 'shared security interests' between both the countries.

The official statement further added that the leaders reviewed the progress on various bilateral defence cooperation initiatives and expressed commitment to further promote defence cooperation engagements between the Armed Forces.

It was also agreed to take forward the agreements in the field of defence industry and defence technology cooperation between India and South Korea.

Kyeong-Doo visited New Delhi earlier in February, this year, to participate in Ministerial level Defence dialogue between the Republic of Korea and India at South Block. (With ANI inputs)

<https://www.dnaindia.com/india/report-rajnath-singh-discusses-covid-19-situation-defence-cooperation-with-south-korean-defence-minister-2831718>



Defence Minister Rajnath Singh with his South Korean counterpart Jeong Kyeong-Doo in Seoul last year (File photo)

DESID ZEEBUSINESS

Sat, 11 July 2020

HAL's order book position is Rs 52,000 crore; It is likely to go up to Rs 1,10,000 crore by end of FY21: R Madhavan, CMD

Defense Acquisition Council (DAC) has given its clearance to Rs 39,000 crore of which Rs 11,000 crore will be spent in buying 12 Su-30 MKI aircraft. Besides, they are also buying MIG-19 and generally, it is coming straight from Russia and we will have some contribution to an extent in it when they will be upgraded. There will be a contribution of HAL in its upgradation

By Jitesh Kumar Jha

R Madhavan, Chairman and Managing Director, Hindustan Aeronautics Ltd (HAL), talks about the Rs 39,000 crore mega order drive cleared by DAC, expansion, CapEx, order book, Atmanirbhar Bharat and repair and overhaul segment during an exclusive interview with Swati Khandelwal, Zee Business. Edited Excerpts:

Q: Tell us about the big news about the government's mega order drive of Rs 39,000 crore? Break down the orders that will come to HAL and how you plan to execute them?

A: Defense Acquisition Council (DAC) has given its clearance to Rs 39,000 crore of which Rs 11,000 crore will be spent in buying 12 Su-30 MKI aircraft. Besides, they are also buying MIG-19 and generally, it is

coming straight from Russia and we will have some contribution to an extent in it when they will be upgraded. There will be a contribution of HAL in its upgradation.



R Madhavan, Chairman and Managing Director, Hindustan Aeronautics Ltd (HAL), talks about the Rs 39,000 crore mega order drive cleared by DAC, expansion, CapEx, order book, Atmanirbhar Bharat and repair and overhaul segment during an exclusive interview

Q: What is the execution timelines of these orders and do you think that you will need some expansions at your production facility?

A: We are expecting that the order will be placed in the next 4-6 months. DAC has just approved and order placement will take 4-6 months from here. There is a fast track procedure in the Defence Procurement Procedure (DPP), accordingly will take this much time in placement of the orders. We can deliver our first aircraft within 12 months of order placement. It can be done in the existing capacity. There is no need for enhancement of the facility because we were developing 12 SU-30 aircraft, which was completed last month. And in the same facility in Nashik, we can also complete further production of the aircraft.

Q: What kind of margins you are expecting on these orders? Is there any capping on the margins?

A: As per DPP, there is a nominated source and we are expecting that we are a nominated source for it. It has a margin of 7.50% and all our new projects happen at 7.50% only.

Q: What are the existing order book of HAL apart from the orders of Rs 39,000 which has been approved and its clearance is awaited? Do you expect any new orders that may add on this year, if yes, then what will be the size of your order book at the end of the financial year?

A: Our current order book position stands at Rs 52,000 crore. If seen according to the yearly sales, then it is a left balance for another 2 years to two and a half year. Our order book position should be for 5 years in which we remain more comfortable because our next cycle time is longer. Accordingly, we expect that our order book position will reach around Rs 1 lakh and 10,000 crores this year. Over the next five year, we expect the order book will improve to Rs 2 lakh 5,000 crores approximately. It is minimum order book position. So the order book position is going to be quite strong especially in terms of Atmanirbhar Bharat (self-reliant India), under which a large portion of Indian procurements will happen from Indian sources, even in the case of defence forces. So, we will also get some benefits from it.

Q: Atmanirbhar Bharat is giving an additional push and you have envisaged an order book in the next one year and few years after it. What kind of orders you are expecting and is there any timelines by which it will happen? Is there any segment in which your participation will increase?

A: Luckily, we are in a very strong position now. Many of our projects are going and fructifying this year and a coming couple of years. Mainly 83 LCA will go for cabinet approval and that is the first order that we expect this year. Along with LCA, we will also get an order of 15 helicopters immediately. I believe that we will get these two orders by the end of this year. In addition to this, our Light Utility Helicopter (LUH) has been certified and its production will start soon. It is a new stream of business for us. Along with this we also have Light Combat Aircraft (LCA) Mark II coming up and after that Advanced Medium Combat Aircraft (AMCA) coming up. So, there is long visibility on the order book for HAL.

Q: You have 20 production units and 11 R&D centres in 8 locations across the country. You have said that you can complete the orders of DAC with the available capacity but you have strong visibility of uptick in the order book. Will you create additional capacity for this over a period of time, if yes, then tell us about the kind of expansion plans that you have?

A: We put around Rs 1,500 crore annually on our CapEx. Apart from this our existing capacity is good enough to take over the possible order book positions. Our expansion basically happens at vendors bases because the maximum of our manufacturing is happening through outsourcing these days. So, the better advantage will happen at Indian vendors' who are associated with us. There are about 2000 vendors who are engaged in manufacturing with us and more possibilities are visible for them in the orders that we will get against Atmanirbhar Bharat.

Q: Share of domestic aircraft and helicopters repair is growing in the market. Repair overhaul accounted for 55% of HAL's overall turnover in FY20. Going forward, what is its visibility and outlook for it in terms of kind of revenue you will get from it?

A: The repair and overhaul (ROH) segment of HAL grew by around 20% last year. However, the manufacturing sector remained constant from the previous year. In future also the ROH will remain strong for us Along with ROH we are also looking towards civil aviation sector. This is one area where we are going to enter and that is one area where we feel that we have a good scope.

Q: 40% of your revenue comes from manufacturing. In FY 20, you manufactured 31 new fixed and rotary-wing aircraft, 117 new aero engines and overall 199 aircraft and 490 aero engines. What is your view on it for FY21 and do you think that the growth in these type of products will be better this time?

A: Our composition of manufacturing Vs repair and overhaul remains the same this year. That is we will produce the same number of aircraft and will continue to the overhaul. The overhaul sector will become slightly more because the requirements of Su-30 overhaul is increasing. So, overhaul segment will increase more this year. So, more or less the composition will remain the same that we had this year.

Q: Update us about the offer for sale (OFS) that the government has planned?

A: The process has started and very soon we will be in the market with another 15% shares.

Q: Do you have plans to bid for any big projects and are you L1 in any of the projects that are awaited?

A: There is no tendering process this year but we have bids in some helicopters, which are pending. Our bids are also ending in engine manufacturing. So, we are expecting the production of engines of Su-30 and MIG-29.

<https://www.zeebiz.com/india/news-hal-s-order-book-position-is-rs-52000-crore-it-is-likely-to-go-up-to-rs-110000-crore-by-end-of-fy21-r-madhavan-cmd-131031>

ThePrint

Sat, 11 July 2020

IAF gets night-flying capability at Leh for MiG-29s, force sees it as a 'game-changer'

The new capability will allow IAF to conduct full-spectrum operations at the LAC on short notice, given Leh's proximity to it

By Amrita Nayak Dutta

New Delhi: The Indian Air Force has acquired the capability to fly its MiG-29 fighters at night from its Leh base in the future, at a time when India and China are taking steps towards disengagement at the Line of Actual Control in Ladakh.

Sources in the IAF said the process of night-flying, which has already begun, would be a "game-changer" because training by night will strengthen its capability to conduct full-spectrum operations at the Line of Actual Control on short notice, given Leh's proximity to the LAC.

The new capability is fuelled by upgrades to the MiG-29, including advanced avionics, and faster and more extensive training of IAF pilots among other factors.

Leh is not a permanent fighter base, but detachments of aircraft are sent there on a regular basis.

An IAF officer said the MiG-29s are carrying out extensive, round-the-clock flying from Leh, which will also help the force validate geospatial data to enhance its capabilities in night operations.

Fighters such as the Sukhoi Su-30s conduct night operations in the Leh and Ladakh regions, but they come from other bases that have night capabilities. Apache and Chinook helicopters also carry out night-time operations.

Significance of the new capability

Senior IAF officers explained that in modern warfare, most operations are carried out at night, for two reasons.

“The first reason is that there are chances of the enemy being comparatively less alert during the night. Secondly, there is less chance of visual detection of the aircraft, which helps in surprising the enemy,” an IAF officer said.

An aircraft can be detected visually and by radars. Flying at night cuts down the visual spectrum of detection.

A second officer explained that Chinese airfields in the LAC region near Ladakh are at a higher altitude than Leh, and thus, their load carrying capacity is lower, while fighters operating from Leh airbase can have a higher load-carrying capacity.

“This gives India a strategic advantage too, both in day and night flying,” the second officer said.

A 2013 policy brief written by Air Marshal V.K. Bhatia on ‘Air Power Across the Himalayas: A Military Appreciation of Indian and Chinese Air Forces’ noted that if the People’s Liberation Army Air Force (PLAAF) was to operate from its well-established bases at Khotan, Kashgar, Golmud etc., it would have to operate from much greater distances to reach the IAF airfields, resulting in reduced payloads and possible requirement of in-flight refuelling etc.

Bhatia’s brief stated that the IAF could easily reach its airfield targets in Tibet from its main bases strung around the entire Indo-Tibetan boundary without any payload or other penalties.

However, an *NDTV report* said China had initiated massive construction activity at the high altitude Ngari Gunsa air base — a dual-use airport located at 14,022 feet altitude and serving the town of Shiquanhe, about 200 km from the Pangong lake.

Night flying in the mountains

IAF officers also explained why night flying is difficult in the mountains, as high altitude and rarefied air limit manoeuvrability and capability of an aircraft.

“The undulating and hazardous terrain and rapidly-changing weather conditions at such high altitude are fraught with risks,” an officer explained, adding that the “depth perception” is not there while flying at night. “Also, there is a delayed engine response at high altitudes.”

The officer added: “Take-off, landing and flying in the hills at night would require a combination of both visual flight rules and instrument flight rules, which is a skill set acquired by pilots with extensive training. This has been happening since the IAF has been preparing for a contingency.”

<https://theprint.in/defence/iaf-gets-night-flying-capability-at-leh-for-mig-29s-force-sees-it-as-a-game-changer/457828/>





Sat, 11 July 2020

PAC to review border road construction at LAC, procurement of high-altitude clothing for troops

In the wake of the recent violent clash between Indian and Chinese soldiers in eastern Ladakh, the parliament's PAC on Friday decided to review the construction of border roads at the Line of Actual Control (LAC) and procurement of high-altitude clothing for the armed forces, and may call the Defense Secretary and other top officials to be briefed on the same.

Friday's meeting of the 22-member Public Accounts Committee (PAC) chaired by leader of Congress in Lok Sabha Adhir Ranjan Chowdhury was attended by 17 out of the total 20 members. Its two seats are vacant. Members of the PAC, in which BJP enjoys majority and is led by senior party leader Bhupender Yadav, thwarted Chowdhury's attempt to select the PM Cares Fund for examination saying its amount was not sanctioned by the parliament and therefore it cannot be taken up by the committee.



MPs from BJD and JD(U) also supported the BJP on the issue.

Meanwhile, the PAC has decided to examine various subjects with special focus being given to the CAG report number 5 of 2017, a performance audit of the Sino-India Border Roads, and CAG report number 13 of 2019 which is on the provisioning and procurement of high altitude-clothing, equipment, ration and housing for soldiers.

As per the papers circulated among the members of the committee on Friday, the Comptroller and Auditor General (CAG) report on border roads is the top most subject for examination by the committee during the year.

CAG's Report 5 of 2017, which in the wake of the recent face-off on LAC between the soldiers of Indian and China, "talks about the highly important issue of construction of Indo-China border roads by Border Roads Organisation seems to be reviewed and further improved upon," as per the agenda papers of the meeting.

Similarly, troops in high-altitude areas such as Siachen, Ladakh, etc need to be provided high-altitude clothing, equipment, special ration and housing facilities and the CAG report number 13 of 2019 points out at delays in procurement of clothing and equipment for troops in these regions, as per PAC's agenda papers.

Sources in the committee said the PAC may call the Defense Secretary and other top officials to be briefed by them on the same.

The PAC meeting on Friday was the first meeting of the panel in the current calendar year. It assumes significance as it was the second meeting of the Lok Sabha's standing committee after parliament was adjourned prematurely on March 23 due to the COVID-19 pandemic.

On June 15, Indian and Chinese soldiers clashed along the LAC in the Galwan valley in eastern Ladakh in which 20 Indian Army personnel were killed.

<https://idrw.org/pac-to-review-border-road-construction-at-lac-procurement-of-high-altitude-clothing-for-troops/#more-230732>



Sat, 11 July 2020

Eye on China: Govt plans to hike budget allocation for BRO

With an eye firmly on China, the government plans to hike the budget allocation for the Border Roads Organization (BRO) to Rs 11,800 crore during the ongoing fiscal to boost infrastructure development in forward areas. The announcement came during the inauguration of six new bridges in the border region of Jammu and Kashmir through a video link by defence minister Rajnath Singh on Thursday.

The annual budget of BRO, which ranged from Rs 3,300 crore to Rs 4,600 crore from 2008 to 2016, was hiked to Rs 8,050 crore in 2019-2020. “With the government focusing on improving infrastructure in border areas, the revised BRO budget for 2020-2021 is likely to be Rs 11,800 crore,” said a defence ministry official.

This will give “a major boost” to ongoing projects and will expedite the construction of strategic roads, bridges and tunnels along our northern borders with China, said the official. The proposed move comes at a time when India and China are locked in a troop confrontation in eastern Ladakh.



The minister himself asserted that the government was committed to developing infrastructure in forward areas and would provide adequate funds for it. Four of the new bridges have been built on the Akhnoor-Pallanwala road in Jammu district, while the other two are on the Tarnah Nallah in Kathua district. With spans ranging from 30 to 300 meters, the bridges have been constructed at a cost of Rs 43 crore by the BRO.

The bridges will not only facilitate movement of the armed forces in the strategically important sectors, but also contribute towards the overall economic growth of these border areas. “Our government is committed to promoting infrastructure on our borders and necessary resources will be provided for this. The government has a keen interest in the development of J&K,” said Singh.

“Continued construction of roads and bridges in the border areas with total commitment by BRO would help in realization of the government’s efforts to reach to the remotest areas. Roads are the lifeline of any nation. Roads in the border areas are not only strategic strengths, but also act to connect remote areas with the mainstream,” he added.

Many other development works are either already underway or in the pipeline in keeping with the needs of the people of J&K as well as the armed forces. Roads with a length of totaling around 1,000-km, for instance, are currently under construction in the Jammu region.

With the use of latest technologies and induction of state-of-the-art equipment over the last two years, the BRO has done road cutting work of over 2,200 km and road surfacing of 4,200 km, while also constructing bridges with the length totaling 5,800 meters, said Singh.

<https://idr.org/eye-on-china-govt-plans-to-hike-budget-allocation-for-bro/#more-230712>

भारत की ताकत बढ़ी / बोइंग ने कहा- एयरफोर्स को 22 अपाचे और 15 चिनूक हेलिकॉप्टर की डिलीवरी पूरी हुई, आखिरी खेप में 5 अपाचे हेलिकॉप्टर आए

- भारत ने अपाचे हेलिकॉप्टर का सबसे एडवांस वैरिएंट एच-64ई खरीदा है
- बोइंग मेक इन इंडिया मुहिम के तहत 200 से अधिक पार्टनर्स के साथ काम कर रही है

नई दिल्ली: अमेरिकी एविएशन कंपनी बोइंग ने इंडियन एयरफोर्स को अपाचे और चिनूक मिलिट्री हेलिकॉप्टरों की डिलीवरी पूरी कर दी है। बोइंग के साथ भारत ने 22 अपाचे हेलिकॉप्टर और 15 चिनूक हेलिकॉप्टर खरीदने का सौदा किया था। बोइंग ने शुक्रवार को बताया कि 5 चिनूक की आखिरी खेप मार्च की शुरुआत में और 5 अपाचे हेलिकॉप्टर की आखिरी खेप जून के अखिरी हफ्ते में हिंडन एयरफोर्स स्टेशन पहुंचाई गई।

बोइंग डिफेंस इंडिया के मैनेजिंग डाइरेक्टर सुरेंद्र आहुजा ने कहा- मिलिट्री हेलिकॉप्टरों की इस डिलीवरी के साथ, हम पार्टनरशिप को आगे भी बनाए रखेंगे और भारतीय रक्षा बलों की क्षमताओं को पूरा करने के लिए पूरी तरह से कमिटेड होकर काम करेंगे।

17 देशों के पास है अपाचे का एडवांस वैरिएंट

भारत ने अपाचे का सबसे एडवांस वैरिएंट एच-64ई खरीदा है। यह अभी तक 17 देशों के पास ही है। एच-64ई अपाचे में लेटेस्ट कम्युनिकेशन सिस्टम, नेविगेशन, सेंसर और वीपन सिस्टम से लैस है। इसमें ऐसा सिस्टम लगा है, जिसके जरिए दिन, रात और सभी तरह के मौसम में टारगेट के बारे में आसानी से जानकारी मिलती है।

इंडियन एयरफोर्स ने चिनूक का लेटेस्ट वर्जन सीएच-47एफ (आई) खरीदा है। दुनिया भर में बीस देशों की एयरफोर्स में या तो चिनूक हेलिकॉप्टर शामिल है या उसकी खरीद की जा रही है। बोइंग ने बयान में कहा कि चिनूक 50 सालों से दुनिया का सबसे भरोसेमंद हैवी-लिफ्ट हेलिकॉप्टर है। यह गर्म जलवायु, ऊंचाई, और तेज हवाओं में भी आसानी से उड़ सकता है।

सितंबर 2015 में हुआ था सौदा

रक्षा मंत्रालय ने सितंबर 2015 में बोइंग के साथ 22 एच-64ई अपाचे और 15 सीएच-47 एफ (आई) चिनूक हेलिकॉप्टरों के प्रोडक्शन और ट्रेनिंग के लिए सौदा किया था। हैदराबाद में बोइंग कंपनी टाटा के साथ जॉइंट वेंचर (टाटा बोइंग एयरोस्पेस लिमिटेड (टीबीएएल) के जरिए अपाचे के एयरोस्ट्रक्चर बनाती है। मौजूदा समय में बोइंग भारत में "मेक इन इंडिया" और "स्किल इंडिया" मुहिम के तहत 200 से अधिक पार्टनरों के साथ मिलकर काम कर रही है।

<https://www.bhaskar.com/national/news/indian-air-force-iaf-update-boeing-delivers-apache-ah-64e-and-chinook-military-ch-47f-i-helicopters-to-iaf-127498198.html>



US aerospace major Boeing completes delivery of 37 military helicopters to India

Boeing said it completed delivery of all 22 Apache and 15 Chinook military helicopters to the IAF and is fully committed to meet their operational needs of the Indian armed forces

New Delhi: In the midst of India's tense border standoff with China, US aerospace major Boeing delivered the final five of the 22 Apache attack helicopters to the Indian Air Force last month, and the fleet has now been part of the assets deployed in key air bases along the Line of Actual Control, officials said on Friday.

Boeing said it completed delivery of all 22 Apache and 15 Chinook military helicopters to the IAF and is fully committed to meet their operational needs of the Indian armed forces.

The AH-64E Apache is one of the world's most advanced multi-role combat helicopters, and is flown by the US Army. The Chinook is a multi-role, vertical-lift platform, primarily used for transporting troops, artillery, equipment and fuel.

India finalised a multi-billion dollar contract with Boeing to procure 22 Apache helicopters and 15 Chinooks for the IAF in September 2015.

Both the Apache and Chinook helicopters have been pressed into service as part of the IAF's deployment along the LAC in view of the bitter standoff with China in eastern Ladakh, officials said.

"With this delivery of military helicopters, we continue to nurture this partnership and are fully committed to working closely with India's defence forces to deliver the right value and capabilities to meet their operational needs," said Surendra Ahuja, Managing Director, Boeing Defence India. India is one of 17 nations to select the Apache and has the most advanced variant, the AH-64E Apache.

Defence and security ties between India and the US have been on an upswing in the last six years. The bilateral defence trade touched USD 18 billion mark in 2019, reflecting growing defence cooperation between the two sides.

Both sides have also been pushing for joint venture and collaboration between private sectors of the two countries in defence manufacturing.

In June 2016, the US had designated India a "Major Defence Partner," intending to elevate defence trade and technology sharing with New Delhi to a level commensurate with that of its closest allies and partners.

In a statement, Boeing said the AH-64E Apache has an improved modernised target acquisition designation system that provides day and night target tracking system.

"In addition to classifying air and ground targets, the fire control radar has been updated to operate in the maritime environment. It is uniquely suited to meet a commander's needs, including reconnaissance, security, peacekeeping operations, and lethal attack, across myriad environments - without reconfiguration," the Boeing said.

It said 20 defence forces around the world either have Chinooks in service, or are on contract to receive them. "The iconic tandem-rotor helicopter has been the world's most reliable and efficient heavy-lift helicopter for more than 50 years, allowing customers to operate in climatic (hot), altitude (high), and crosswind conditions," the company said. It said the CH-47F(I) Chinook contains a modern machined airframe, a common avionics architecture system cockpit, and a



An apache helicopter flies from Leh Air Base amid border tensions with China, in Leh. (PTI)

digital automatic flight control system. “Those innovations and technologies will help the Indian Air Force meet evolving mission demands, maximize interoperability, and reduce life-cycle costs,” it said.

Earlier this year, India and the US signed a contract for the acquisition of six Apaches for the Indian Army during President Donald Trump’s visit to Delhi. Boeing’s joint venture with Tata in Hyderabad has been producing aero-structures for the AH-64 Apache helicopter for both US Army and international customers.

<https://www.hindustantimes.com/india-news/us-aerospace-major-boeing-completes-delivery-of-37-military-helicopters-to-india/story-Gw5SWY6Pu5h0XxL4BHzzgM.html>

THE ECONOMIC TIMES

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In clear message to China, India to invite Australian Navy for Malabar drill

The exercise brings together navies of India, Japan, Australia and the US in the Bay of Bengal
By Sudhi Ranjan Sen and Archana Chaudhary

India plans to invite Australia to join the annual Malabar naval exercise that has so far included just Japan and the U.S., in a move that could risk China’s ire.

The decision to include Australia in the drills — the first time all members of the regional grouping known as the Quad will be engaged at a military level — comes as Beijing and New Delhi are caught up in their worst border tensions in four decades. The exercise will bring together the navies of India, Japan, Australia and the U.S. in the Bay of Bengal at the end of the year, according to senior Indian officials who asked not to be identified, citing rules.

New Delhi is expected to clear the way next week for a formal invitation to Australia following final government clearance and consultations with the U.S. and Japan, the officials said.

“The timing of India potentially letting Australia into Malabar would be especially significant at this juncture,” said Derek Grossman, researcher at the Washington-based RAND Corporation who worked in the U.S. intelligence community for more than a decade. “It would send a significant message to China that the Quad — U.S., Australia, Japan, and India — are de facto conducting joint naval exercises, even if not technically conducted under the auspices of a Quad event.”

China has been uncomfortable with the informal coalition of four democracies, which was first formed in 2004 to help nations in the Indo-Pacific after the tsunami and revived in 2017. Post the coronavirus pandemic, the grouping has been coordinating efforts every month with Vietnam, South Korea and New Zealand.

Indian Navy Spokesperson Commander Vivek Madhawal declined to comment.

A spokesperson for Australia’s defence department said in an emailed statement on Friday that while the nation was yet to receive an invitation to Exercise Malabar, “Australia sees value in participating in quadrilateral defense activities in order to increase interoperability and advance our collective interests in a free, open and prosperous Indo-Pacific region.”

Strengthening Ties

While the Malabar exercises between U.S. and Indian navies were instituted in 1992, they have been more regular since 2004 with other Asian nations joining in the annual event. China had



While the Malabar exercises between US and Indian navies were instituted in 1992, they have been more regular since 2004.

objected to the only other time Australia participated in the drills along with India, Japan, U.S. and Singapore in 2007.

India's inclusion of Australia this year follows a defence agreement and upgrading ties to a Comprehensive Strategic Partnership. The Mutual Logistics support agreement announced in May by Prime Ministers Narendra Modi and Scott Morrison allows access to each other's bases and ports. India has a similar agreement with the U.S.

Canberra's inclusion in the games was "only a matter of time" given improving defense and economic ties, according to Biren Nanda, former Indian High Commissioner to Australia and senior fellow at Delhi Policy Group. Australia's merchandise trade with India for the year ended June 2019 was A\$21.1 billion (\$14.5 billion), according to Australia's Department of Foreign Affairs and Trade.

"There's no direct relation between inviting Australia and what's happening at the Sino-Indian border," said Nanda in a phone interview. "This was a natural progression. Yet the question will be raised: how would the Chinese regard this? And they will react negatively. Just like they had done earlier."

Weaponized Quad

China objected to Japan's inclusion in the U.S-India annual Malabar event in 2015 with the then foreign ministry spokesperson Hong Lei warning "relevant countries" to not "provoke confrontation and create tension" in the region. Five years later, with an assertive China pushing neighbours across the Asian seas, Nanda expects a similar response.

Yet, there may be more acceptance to the idea of "like-minded democracies that seek to keep the Indo-Pacific free and open" amid India's rapidly souring China ties, purely out of frustration, said Rajeswari Pillai Rajagoplan, distinguished fellow at New Delhi-based Observer Research Foundation and author of 'Clashing Titans: Military Strategy and Insecurity Among Asian Great Powers.'

Although India and China are now in the process of disengaging along their 3,488 kilometer (2,167 mile) unmarked boundary in the Himalayas after high-level military and diplomatic talks, the deadly clashes that followed the months-long standoff in the Galwan valley was a blow to relations between the nuclear-armed neighbours.

"Especially after Galwan, there's a growing realization in New Delhi's elite circles that its increasingly difficult to trust China. They have broken more than four decades of agreements. Good trade ties are no guarantee of peace," said Rajagoplan. "They have time and again tried to interfere in other nations' foreign policy. But there's an agreement in India that China should not have a say in who our friends are."

With Washington indicating its willingness to back the region through an increased force deployment in Asia, the Malabar exercises may take on more importance.

"The Quad has always been a security platform but didn't have a military context to it," said Rajagoplan. "The Malabar exercises may give it just that thanks to China upping its ante and threatening the region's security." With assistance from Jason Scott.

<https://economictimes.indiatimes.com/news/defence/in-clear-message-to-china-india-to-invite-australian-navy-for-malabar-drill/articleshow/76885282.cms>



Sat, 11 July 2020

Advantage India, S-400 could detect F-16s at long range, Big worry for Pakistani Air Force

By Narayan Apte

Turkey tested Russian-made S-400 air defense systems on US-made F-16 fighter jets in November 2019, a source close to the Turkish defense industry told Russian Media agency "TASS". On November 25, 2019, CNN Turk reported that various aircraft, including F-16 fighter jets, were scrambled near Ankara to test S-400. The Turkish military tested the communication between the air defense systems and the aircraft during those exercises.

Turkish Air Force F-16 and F-4 fighter jets carried out Low Level and High altitude flying to testing S-400 system back then to check if the missile system could be tracked and searched in long-range and both 91N6E surveillance and acquisition radar and the 96L6E air search and acquisition radar working in tandem was able to detect F-16s at long range with missile getting firing clearance soon.



Turkey owned S-400 system manned by Mix Russian-Turkish Crew who have been trained for such scenarios and was joined by senior officials of the Turkish Air defense unit as observers were to demonstrate the capabilities of the S-400 Theater air defense system. Defense analysts believe that it was also done to see if Turkish jets can lure rival jets into the S-400 kill zone and also to see if Identification, friend or foe (IFF) system can differentiate between Two American jets with one playing the aggressor.

This should ring alarm bells in the Islamabad which counts on it American build 70 odd F-16s to provide it air superiority against Indian Air Force in the region in case of full-fledged war takes place between both countries. The S-400 can engage targets at a distance of 400 km and an altitude of up to 30 km and can track an Aerial Tanker or AWACS size platforms at a range of 600km and fighter size targets at 400 km.

Indian Defence analysts have been claiming that long-range Radars which comes with S-400 Theater air defense system will ensure that all PAF's jets, once airborne from their respected air bases, will be picked up the radars of the S-400 due to close proximity of the all the forward air bases of the PAF in its Eastern sector and can S400 will be able to engage up to 36 targets at a time and simultaneously launch 72 missiles.

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https://idrw.org/advantage-india-s-400-could-detect-f-16s-at-long-range-big-worry-for-pakistani-air-force/#disqus_thread

To counter belligerent China, India expresses intent to carry out navigation activities in South China Sea

Philippine Defence Minister Delfin Lorenzana said India has expressed its intent to carry out navigation activities in the South China Sea

Key Highlights

- *China claims historical jurisdiction over about 90 per cent of the sea*
- *Vietnam and the Philippines had recently criticised China for holding military drills in South China Sea*
- *The South China Sea is a crucial region in terms of global trade*

New Delhi: To counter belligerent China in its neighbourhood, India expressed intent to carry out navigation activities in the South China Sea.

Making the declaration, Philippine Defence Minister Delfin Lorenzana further said navigation in the South China Sea is open to all countries, reported ET.

"We do not prevent other countries from passing through or doing things there in the South China Sea. The British do pass through the South China Sea. The French, all other countries. We do not invite them to come," the defence minister said.

Philippine concerned over China's Naval exercises

Adding India can also be present in the area, Lorenzana also expressed concerns over China's naval exercises in the South China Sea.

With nations pre-occupied with fighting the COVID-19 pandemic and China recovering from the deadly impact of the virus, it has been testing international patience by its systematic aggression and assertion in the Himalayas, SCS region and now Bhutan – where Beijing has fixed its eyes on a new area in the eastern part of the country.

The announcement by Lorenzana comes amid telephonic conversation between PM Narendra Modi and Philippine president after which India decided to expand its strategic partnership with the Philippines in the South China Sea region.

Last year navies from India, USA, Philippines and Japan conducted joint sail in the South China Sea region to demonstrate the presence of like-minded parties in the SCS region, reported ET.

USS Nimitz and USS Ronald Reagan in South China Sea

Meanwhile, the US Navy's two nuclear-powered aircraft carriers – USS Nimitz and USS Ronald Reagan – are present in the South China Sea.

Later, China issued a statement accusing the US of flexing its military muscles in the South China Sea with foreign ministry spokesperson Zhao Lijian slamming the US for undermining stability in the area.

90 per cent of areas in the SCS region is claimed by China and apart from Beijing five other nations also claim some parts of the sea.

<https://www.timesnownews.com/india/article/to-counter-belligerent-china-india-expresses-intent-to-carry-out-navigation-activities-in-south-china-sea/618865>

View: China's ominous turn and what it means for India, others

How should the world, and particularly India, then view the rise of China? If there was any illusion, it has been shattered by the recent Chinese belligerence against many countries in the Indo-Pacific: India, Australia, Vietnam, Japan, Indonesia etc

By Sushil Ranjan Kumar

The old adage that 'power tends to corrupt, and absolute power corrupts absolutely' is of course true, but power has many other attributes. For example, it also gives agency to latent human instinct to dominate others.

Given this, it is surprising that a large number of people including some strategic thinkers still believe that China will be different from the superpowers of yesteryears. Yes, China may not enjoy as much power as the US did in its heydays, but similarly the US never had the kind of hegemony that Great Britain possessed. China's behaviour may be different because the limits of its power will be circumscribed by a more constraining geopolitical environment, and certainly not due to lack of intention, or even will.



A file image of J-10 fighter jets of China's People's Liberation Army Air Force

How should the world, and particularly India, then view the rise of China? If there was any illusion, it has been shattered by the recent Chinese belligerence against many countries in the Indo-Pacific: India, Australia, Vietnam, Japan, Indonesia etc. China has abandoned the 'hide your strength and bide your time' strategy of Deng and embarked on a path to establish its hegemony more overtly by bending others to its will.

Its actions now dangerously resemble those of Germany in the early twentieth century, which similarly had discarded Bismarck's policy of not disturbing the balance of power in Europe in order to preserve peace. During that period, Germany had alarmed Britain by its rapid naval expansion, riled Russia in the Balkans and humiliated France in two Moroccan crises. Germany's bellicosity had precipitated the events leading to the First World War, the treaty of Versailles and the rise of the Nazis, finally culminating in the Second World War.

China is also expanding and modernizing its navy at a breath-taking speed; it has already surpassed Japan and is now competing with the US in the Pacific. It has boundary disputes with almost all its neighbours. It has weaponized trade to harass weaker countries and ensnared some of them in debt, forcing them to forfeit part of their sovereignty, but more appallingly, it has securitized the pandemic.

China shares with Nazi Germany the contempt for unwieldy and fractious democracies and exhibits the traits of a totalitarian state as prescribed by Zbigniew Brzezinski, a Polish-American political scientist and diplomat. It has crafted a compelling narrative of a century of humiliation to cloak its real intentions. Worse, in a data driven world, China is now extensively using totalitarian technology, which was not available to the Nazis, to control action and behaviour of people.

Therefore, the conversation about how to live in a world dominated by China has acquired more seriousness in many capitals from Washington to Canberra. Especially in India, the debate about aligning with the US and the consequent loss of strategic autonomy has resurfaced. But is strategic autonomy an absolute concept or is it available only in degrees? When two countries enter into alliance or partnership, they voluntarily undertake to put restrictions on some of their actions in lieu of obtaining greater freedom in some other actions. Surely, in the event of India aligning with the US, it will lose some of the options it could otherwise exercise, but equally, it will gain some other options, which are not available now.

The key to this calculus is whether India will have a greater degree of freedom in resisting Chinese aggression or not. And the answer to the question is pretty obvious for many reasons.

First, the US is a distant power with whom we share no boundary while China is breathing down our neck; second, its relative power is declining while China is on the ascendant; third, it is a democratic country with tremendous diversity and shared values; fourth, we have lived with the US as a superpower, and although we have our fair share of complain against it, our sovereignty has never been threatened by the US in the way it has been done by China, without even being a superpower.

True, the US has sided with Pakistan, but this is partly because we were closer to the Soviet Union while professing to be non-aligned, and of late, Sino-Pakistan axis has done more harm to India's interest than the American alliance with Pakistan; and finally, we have some ability to influence the polity and society in the US while China is almost a black hole.

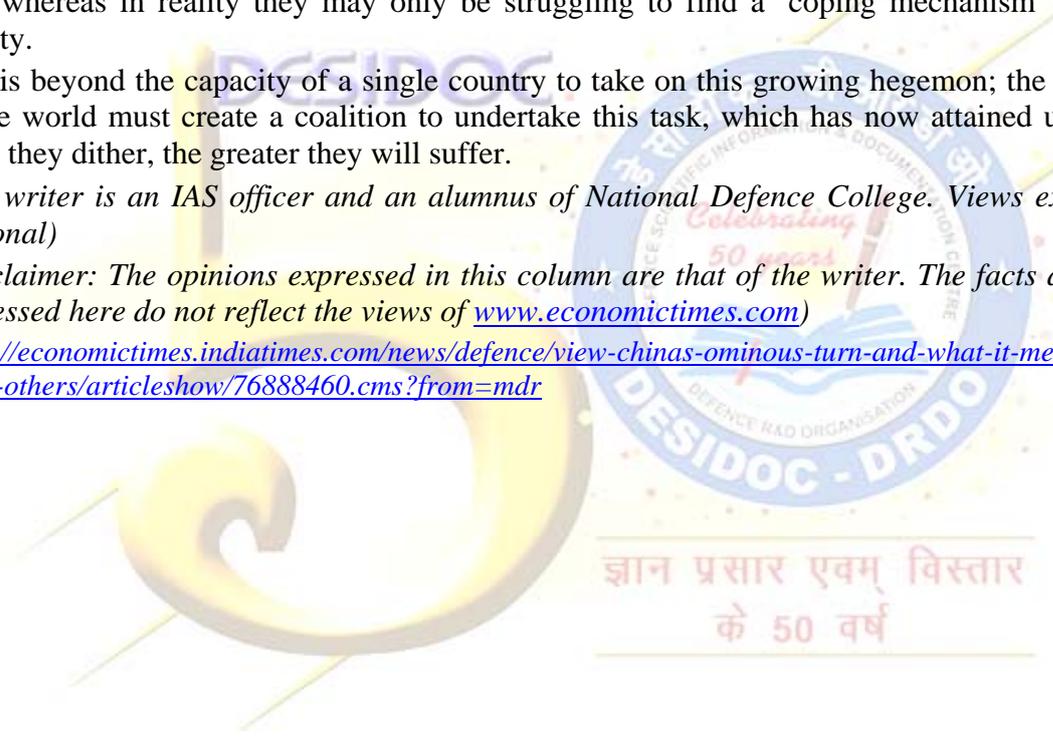
At this moment, it is in the interest of China to keep its opponents divided, a game it is playing rather skilfully by threatening them to desist from entering into an alliance with the US so that it can bully them individually, until it acquires power to challenge them collectively. It has cleverly delegitimized any effort to resist its bullying tactics by terming it as 'containment', a terminology from the Cold War era with negative connotation; as if these countries are determined to stymie its rise, whereas in reality they may only be struggling to find a 'coping mechanism' to live with dignity.

It is beyond the capacity of a single country to take on this growing hegemon; the democracies of the world must create a coalition to undertake this task, which has now attained urgency. The more they dither, the greater they will suffer.

(The writer is an IAS officer and an alumnus of National Defence College. Views expressed are personal)

(Disclaimer: The opinions expressed in this column are that of the writer. The facts and opinions expressed here do not reflect the views of www.economictimes.com)

<https://economictimes.indiatimes.com/news/defence/view-chinas-ominous-turn-and-what-it-means-for-india-others/articleshow/76888460.cms?from=mdr>



ज्ञान प्रसार एवम् विस्तार
के 50 वर्ष

ISRO doesn't know when it will be ready to restart space launches

- *At the start of 2020, Indian Space Research Organisation (ISRO) Chairman and Secretary Department of Space K. Sivan said that the space agency was planning to have 25 launches.*
- *All was going well for ISRO after the crashlanding of India's moon lander Vikram on the lunar surface in 2019.*
- *The first setback of the year for ISRO came on March 4, when it had to call off the launch of GISAT-1, a day before its actual launch, owing to technical reasons.*

What would have been an insipid first half of the calendar year 2020 for the Indian space agency turned a bit interesting towards the end, with the government announcing its decision to open up the sector to private participation.

At the start of 2020, Indian Space Research Organisation (ISRO) Chairman and Secretary Department of Space K. Sivan said that the space agency was planning to have 25 launches -- including Aditya-L1 satellite, Geo Imaging Satellite (GISAT-1), realisation of Small Satellite Launch Vehicle (SSLV) or small rocket (carrying capacity 500 kg), navigation satellite with indigenous atomic clocks and Indian Data Relay Satellite System (IDRSS), and GSAT-20 satellite with electric propulsion.



Sivan also said India will embark on its third moon mission 'Chandrayaan-3' and attempt to land a lander on the lunar surface sometime in 2020-21.

All was going well for ISRO after the crashlanding of India's moon lander Vikram on the lunar surface in 2019.

The year began well ISRO with the launch of the 3,357 kg communication satellite GSAT-30 by the European space agency Arianespace rocket Ariane 5 on January 17.

The ISRO also showcased its robot/half-humanoid -- Vyommित्रा - which was part of its human space mission programme 'Gaganyaan'.

The first setback of the year for ISRO came on March 4, when it had to call off the launch of GISAT-1, a day before its actual launch, owing to technical reasons.

The ISRO did not share any detail about the technical reasons, or the glitch, and its rectification since then. It is also not known when the satellite with a very good camera would be launched.

Then came the Covid-19 lockdown within and outside India that had its cascading impact on ISRO's core plans like the realisation of SSLV, launch of GISAT-1, delay in the first test-flight of the rocket as part of Gaganyaan mission.

"During the lockdown, industries that were supplying components were not working. Our own officials were not able to attend office. Further travel to Sriharikota in Andhra Pradesh for satellite launch by the officials were not possible due to the lockdown," Sivan told IANS.

It is also not known when ISRO will be able to restart its satellite launch operations.

With coronavirus infection spreading fast in the county, ISRO also started work on developing a low-cost ventilator and sanitiser.

Meanwhile, two positive developments happened for ISRO -- securing an Indian patent for its liquid cooling and heating garment (LCHG) suitable for space applications and for its method of manufacturing highland lunar soil simulant or simply lunar/moon soil.

On May 16, Union Finance Minister Nirmala Sitharaman announced that Indian private sector will be a co-traveller in India's space-sector journey and a level-playing field will be provided for them in satellites, launches, and space-based services.

She also said that a predictable policy and regulatory environment will be provided to private players.

The future projects for planetary exploration, outer space travel and others are to be opened up for the private sector, adding there will be a liberal geo-spatial data policy for providing remote-sensing data to tech-entrepreneurs subject to various checks.

Welcoming the announcement, sectoral experts suggested various models for restructuring of ISRO and also urged the government to set up an independent regulator and also enact necessary legislation.

On June 24, the Union Cabinet decided to set up Indian National Space Promotion and Authorisation Centre (IN-SPACe), making ISRO to focus on research and development (R&D) of new technologies, exploration missions, and human spaceflight programme.

Singh said the Union Cabinet led by Prime Minister Narendra Modi decided to set up IN-SPACe to provide a level playing field for private companies to use Indian space infrastructure.

He also said the New Space India Limited (NSIL) will endeavour to re-orient space activities from a 'supply driven' model to 'demand driven' model, thereby ensuring optimum utilisation of the country's space assets.

Former ISRO Chairman Madhavan Nair said there should be a national space law to define responsibilities and liabilities.

Pointing out the role envisaged for IN-SPACe and the demand for a sectoral regulator, when queried whether the proposed body could be converted into the space sector regulator, Sivan told IANS: "IN-SPACe could be turned into a regulatory body when the necessary laws and regulations are in place."

"We are on the job of getting ready the Space Activities Bill. It will define the space activities, liabilities and other aspects," he added.

As part of the reform process, new navigation policy is also being proposed. Suitable changes in the remote sensing data policy as well as SATCOM policy are on the anvil to align them to an open and inclusive space sector, said Sivan.

"The best is to establish an independent regulator -- Space Regulatory Authority of India (SRAI) -- which will create a level-playing field for many of the emerging players," Narayan Prasad, Chief Operating Officer, satsearch, told IANS.

Establishing an independent regulator could allow a systematic review and reforms on a continuous basis rather than one-off announcements, Prasad said.

As per current scheme of things, IN-SPACe will have its own directorates for technical, legal, safety and security, monitoring as well as activities promotion for assessing the private sector's needs and coordination of the activities.

IN-SPACe would have a board and representatives from industry, academia and the government, Sivan said.

"Initially, IN-SPACe will be manned by people from the existing space setup. Later, people from outside will be taken in. It will have its funds from the budgetary allocations for the DoS. The new body may not need big financial allocations," Sivan remarked.

Stressing that the ISRO's importance will not diminish with the entry of IN-SPACe, Sivan said all the existing centres - manufacturing, services, rocket launch centres - would continue to be with the ISRO.

"The ISRO will be involved in research and development in advanced technologies, human space missions. It will also share its technological expertise with the private parties. The proposed new body will not disturb the existing ones. It will be another autonomous body," Sivan said.

Industry officials are hoping to see further steps being taken by the government regarding the space sector during the second half of 2020.

But as regards the satellite launches - domestic as well as foreign for a fee - by ISRO during the year depends on the spread or control of coronavirus and the resultant lockdown.

<https://www.businessinsider.in/science/space/news/isro-doesnt-know-when-it-will-be-ready-to-restart-space-launches/articleshow/76891134.cms>



Sat, 11 July 2020

Liquid water is more than just H₂O molecules

Skoltech scientists in collaboration with researchers from the University of Stuttgart showed that the concentration of short-lived ions (H₃O⁺ and OH⁻) in pure liquid water is much higher than that assumed to evaluate the pH, hence significantly changing our understanding of the dynamical structure of water.

Figure: infrared spectra of light (red), heavy (blue), semiheavy (gray) water, and ionic species that have been identified in the current study. Red, white and black circles depict oxygen, hydrogen and deuterium atoms, respectively. Arrows show the directions of species vibrational deformation.

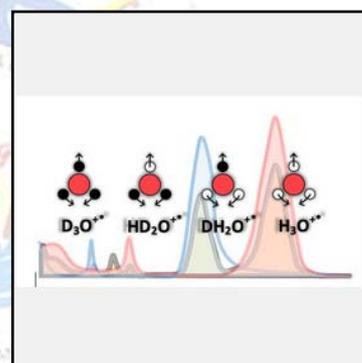


Image: Infrared spectra of light (red), heavy (blue), semiheavy (gray) water, and ionic species that have been identified in the current study. Red, white and black circles depict oxygen, hydrogen and...

Intrinsic ionic species of liquid water play an important role in the redox processes, catalytic reactions and electrochemical systems. A low-barrier tunneling of hydrogen atom between the H₂O molecules, caused by nuclear quantum effects, is expected to generate short-lived excess proton states. However, to date, there has been no information on the concentration of such excess protons states in pure water.

Skoltech scientists in collaboration with German researchers measured the ion-molecular composition of liquid water on the sub-picosecond time scale. The result surprised scientists as they observed that up to several percent of H₂O molecules were temporarily ionized.

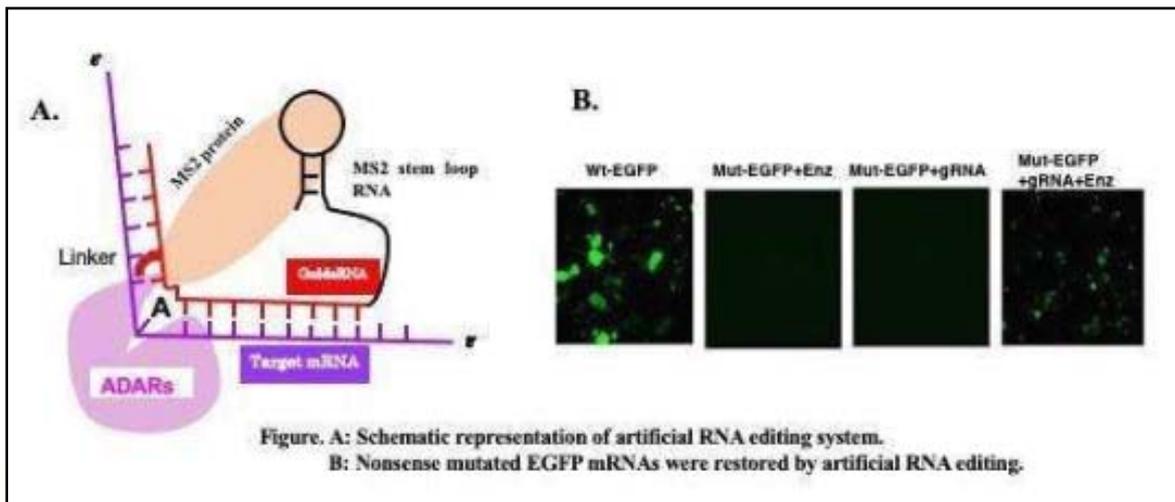
"We used water isotopologues: ordinary (H₂O), heavy (D₂O), and semi-heavy (HDO) water, to identify excess-proton states. By gradually substituting the hydrogen atoms (H) with deuterium (D), we changed the relative concentration of excess-proton-related species, such as HD₂O⁺, DH₂O⁺, H₃O⁺ and D₃O⁺, and identified their contributions to the cumulative infrared absorption. We found concentration-dependent spectral features near molecular bending modes of semi-heavy water spectra that no known model was able to explain. We associated these features with excess protons that may be expected to exist on the picosecond time scale," said one of the co-authors, Prof. Henni Ouerdane from the Skoltech Center for Energy Science and Technology (CEST).

"While previous studies of water structure were based on crystallographic experiments, and did not reflect the dynamics of water, our research brings new insights into the intricate water structure at ultra-short time scale. The finding anticipates new effects of electric field interaction with water, as well as other anomalous properties of water," concluded the lead author, Dr. Vasily Artemov, Senior Research Scientist at CEST.

https://www.eurekaalert.org/pub_releases/2020-07/sios-lwi070920.php

Artificial RNA editing with ADAR for gene therapy

Many of the diseases caused by point mutations have no established therapeutic approaches. Prof. Tsukahara and colleagues (Japan Advanced Institute of Science and Technology) are studying a therapeutic method using artificial RNA editing. Artificial site-directed RNA editing is an important technique for modifying genes and ultimately regulating protein function. We are trying to modify the genetic code of transcripts (RNA) by artificial RNA editing for the treatment of genetic disorders.



Credit: Japan Advanced Institute of Science and Technology

Although genome editing is drawing attention as a gene repair technology, genome editing such as CRISPR/Cas9 may result in permanent alterations, potentially affecting multiple loci. Currently, it is very difficult to perform accurate genome editing in all targeted cells *in vivo*. Although it is possible to edit the genome in a fertilized egg, embryo, or cells, it is not suitable for gene therapy in humans. Moreover, genome editing raises ethical concerns. Therefore, we believe that genome editing is a suitable method for "ex vivo" techniques, or for use in fertilized eggs, but not throughout a patient's body. In contrary, changes resulting from the RNA editing are not permanent because they do not affect the genome sequence, and can be context-specific. Therefore, for the purpose of therapeutic treatments, RNA editing is preferable to genome editing, says Prof. Tsukahara.

RNA editing is a physiological process and widespread in living organisms to produce various proteins with different functions from a single gene. In mammals, C or A of the RNA chain is base sequence-specifically hydrolytically deaminating, whereby C is replaced by U and A by I (inosine). Since I forms a Watson-Crick base pair with C, the genetic code is synonymous with G. These base conversions occur as a result of deamination of A or C, which has been found to be catalyzed by ADAR and APOBEC family enzymes. Recently, various techniques for RNA restoration by artificial RNA editing using ADARs have been reported.

In this paper, we review recent findings regarding the application of ADARs to restoring the genetic code along with different approaches involved in the process of artificial RNA editing by ADAR. We have also addressed comparative studies of the various isoforms of ADARs. Therefore, we will try to provide a detailed overview of the artificial RNA editing and the role of ADAR with a focus on the enzymatic site directed A-to-I editing.

Most of artificial RNA editing systems use an active site of catalytic enzymes, ADARs, and a guide RNA complementary to the target to recruit an active site to the target RNA. One approach to artificial RNA editing is the use of chemical methods. Vogel and colleagues employed SNAP tag to join ADARs with a guide RNA and reported that the system is functional in vitro and in vivo. However, this technique requires a continuous supply of effector molecules to be effective. It is also known to use RNA-binding proteins to bind guide RNAs to enzymes. Two types of tethering system originating from bacteriophage are typically used in eukaryotes: the Lambda N system and MS2 system. Use of the ADAR enzyme with the MS2 system enables restoration of the genetic code, and holds promise for gene therapy.

In the future, site-directed A-to-I RNA editing including, enzymatic and non-enzymatic A-to-I editing, specially enzymatic, promises to effectively correct a variety of human diseases related to G to A mutations. A successful approach to treat the single mutation diseases will work as a potential remedy to the patients and will open a new era in this field of research.

More information:

Sonali Bhakta et al. Artificial RNA Editing with ADAR for Gene Therapy, *Current Gene Therapy* (2020).

[DOI: 10.2174/1566523220666200516170137](https://doi.org/10.2174/1566523220666200516170137)

<https://medicalxpress.com/news/2020-07-artificial-rna-adar-gene-therapy.html>



Sat, 11 July 2020

New cathode coating extends lithium-ion battery life, boosts safety

By Jo Napolitano

The idea, three years in the making, was developed at Argonne in collaboration with HKUST. It was funded by the DOE's Office of Renewable Energy and Energy Efficiency, Vehicle Technologies Office.

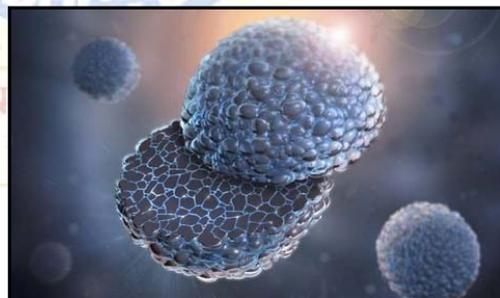
"This is an incredibly exciting advancement," said Khalil Amine, Argonne distinguished fellow and head of the Technology Development group in the Electrochemical Energy Storage department within Argonne's Chemical Sciences and Engineering division. "This could significantly improve our experience with the devices we've come to rely on."

The initial experiment was conducted in Hong Kong: HKUST had the ideal set-up and was able to carry out the work under the laboratory's specifications.

Lithium batteries, used to power everything from electric cars to cell phones and computers, have been using a cathode coating technology for more than 15 years.

But it is not without limitations: It is only a partial coating, one that covers just a small part of the outside of the cathode particle and does not protect the cathode when operating at a high voltage or at high temperature.

The cathodes researchers were studying are metal oxides made of nickel, manganese and cobalt. A cathode charged at high voltage generates oxygen, oxidizing the electrolyte, creating an unwanted film on the cathode and causing energy loss. High temperatures increase the speed of these reactions, compromising the electro-chemical performance of the battery itself.



PEDOT is coated on both primary and secondary particles of NMC cathode used in EVs. This coating protects the cathode against reactivity with electrolyte and extends the life of the battery. Credit: Argonne National Laboratory

The new coating, made with a conducting polymer called poly (3,4-ethylenedioxythiophene) (PEDOT), marks a breakthrough in lithium-ion battery technology since it fully and completely protects each particle of the cathode—inside and out—from reactivity with the electrolyte.

PEDOT is applied using Argonne's oxidative chemical vapor deposition technique, which uses gas to ensure the coating is applied to every particle of the cathode, forming a robust skin.

The conventional coating slows down lithium diffusion in and out of the cathode particle, decreasing battery efficiency because of poor electronic and ionic conductivity.

By contrast, the new Argonne coating facilitates the transport of lithium ions and electrons in and out of the cathode, boosting battery energy.

Argonne's Center for Nanoscale Materials (CNM), a DOE Office of Science User Facility, has played a significant role in the experimentation. Researchers used CNM's Zeiss NVision 40 focused ion beam-scanning electron microscopy dual-beam system and FEI Talos F200X (S)TEM equipped with a SuperX energy-dispersive X-ray spectrometer to confirm the coating of PEDOT on both primary and secondary particles of layered cathodes and their stability after battery cycling.

Argonne assistant chemist Gui-Liang Xu of the Chemical Sciences and Engineering Division (CSE), scientist Yuzi Liu (CNM), postdoctoral appointee Xiang Liu (CSE), postdoctoral research scholar Han Gao (CSE), visiting graduate student Xinwei Zhou (CNM), physicist Yang Ren of the Advanced Photon Source, another DOE Office of Science User Facility at Argonne, and Zonghai Chen (CSE) also contributed to the project, Amine said.

Currently, lithium-ion batteries operate at 4.2 V at the cell level. The new coating can help increase the voltage to 4.6 V. This 15 percent difference can lead to a significant cost reduction of the overall battery pack.

"This would increase the driving range of electric cars and boost the battery life of cell phones and laptops, ultimately changing the way we live," Amine said.

A paper on the topic was published in *Advanced Energy Materials* in December 2019, and another published in the journal *Nature* in May 2019.

More information: Bing-Qing Xiong et al. Boosting Superior Lithium Storage Performance of Alloy-Based Anode Materials via Ultraconformal Sb Coating-Derived Favorable Solid-Electrolyte Interphase, *Advanced Energy Materials* (2019).

[DOI: 10.1002/aenm.201903186](https://doi.org/10.1002/aenm.201903186)

Gui-Liang Xu et al. Building ultraconformal protective layers on both secondary and primary particles of layered lithium transition metal oxide cathodes, *Nature Energy* (2019).

[DOI: 10.1038/s41560-019-0387-1](https://doi.org/10.1038/s41560-019-0387-1)

<https://techxplore.com/news/2020-07-cathode-coating-lithium-ion-battery-life.html>

A new study discovers whale skulls are wonkier than ever

Researchers including those from the Natural History Museum in London, have found that the skulls of toothed whales have become more asymmetric over time.

The team also found that early ancestors of living whales had little cranial asymmetry and likely were not able to echolocate.

The study used the skulls of 84 living and 78 extinct cetaceans from 50 million years ago to living whales. 34 of the specimens used, were from the Natural History Museum's collections. The team used three-dimensional geometric morphometrics and phylogenetic comparative methods to reconstruct the evolution of asymmetry through to living whales. The research is the most comprehensive study to date, spanning the evolutionary history of cetaceans.



Lead author Ellen Coombs from the Natural History Museum said: 'There are two sub orders of whales - the mysticetes, including humpback whales, and odontocetes, toothed whales which include dolphins. Scientists are aware that toothed whales have asymmetric skulls, they are one of the only groups of animals on the planet that have asymmetry as the natural condition of the skull. The reason for this is because they echolocate, they have a lot of soft tissue which allows them to create sound for echolocation. Gradually as the soft tissue has evolved it has caused the skull to evolve, hence the wonky asymmetry.'

The scientists found that mysticetes, cetaceans such as the Natural History Museum's iconic Blue Whale - Hope, have maintained a low level of cranial asymmetry since their origin. They found that if asymmetry reflects ultrasonic sound production ability, it is unlikely that mysticetes were ever able to echolocate.

Researchers noticed asymmetry appearing in the skulls from around 30 million years ago. The scientists found that cetaceans with wonky skulls such as narwhals, Ganges river dolphins and sperm whales have developed specialist echolocation to hunt and survive in their such niche habitats such as shallow icy waters and deep oceans. Their echolocation ability may have led to their skulls becoming more asymmetrical.

UCL PhD student Ellen Coombs continues: 'We looked at what was happening around the time of these big symmetrical baleen whales diverging from the asymmetrical toothed whales around 39 million years ago. It's known that archaeocetes, the earliest whales of 50 million years ago, had wonky rostrums possibly a distortion of the fossils, but potentially related to directional hearing in order to hear underwater. This is lost in early neocetes - the taxon including the most recent common ancestor of living cetaceans. It was unclear when nasofacial asymmetry evolved during the transition from archaeocetes to modern whales, but we think it started to appear around 30 millions years ago. And perhaps toothed whale skulls and the overlying soft tissues will continue to get wonkier as their echolocation techniques become more specialized.'

The paper was published in BMC Biology on 10 July 2020.

<https://www.nhm.ac.uk/press-office/press-releases/a-new-study-discovers-whale-skulls-are-wonkier-than-ever.html>

Scientists demonstrate salmonella biofilm protein that causes autoimmune responses

In breakthrough research, scientists have demonstrated that a Salmonella biofilm protein can cause autoimmune responses and arthritis in animals

Washington DC” In breakthrough research, scientists have demonstrated that a Salmonella biofilm protein can cause autoimmune responses and arthritis in animals. The study from the Vaccine and Infectious Disease Organization-International Vaccine Centre (VIDO-InterVac) at the University of Saskatchewan (USask) and Temple University (Philadelphia, U.S.) was published in the journal PLOS Pathogens.

Salmonella was previously thought to only form biofilms in the environment, such as on food processing surfaces. Biofilms are dense collections of bacteria that stick together on surfaces to protect the bacteria from harsh conditions, including antibiotics and disinfectants. Detecting biofilms in an animal during infection was a surprise. In research, a VIDO-InterVac team led by Aaron White discovered that Salmonella biofilms were formed in the intestines of infected mice. For the study, the team used a mouse model to replicate human foodborne illness and showed that a biofilm protein called "curli" that grows on the surface of bacteria was connected to negative health outcomes.



Curli are a special type of protein called amyloids. Similar human proteins have been associated with neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease, and Amyotrophic lateral sclerosis (ALS or Lou Gehrig's disease). Scientists don't know how these diseases start but have speculated that something must "trigger" the accumulation of amyloids. "We are the first to show that a food-borne pathogen can make these types of proteins in the gut," said White, a leading expert on Salmonella biofilms and curli amyloids.

"There has been speculation that bacteria can stimulate amyloid plaque formation in Alzheimer's, Parkinson's and ALS and contribute to disease progression. The discovery of curli in the gut could represent an important link, pointing to a potentially infectious cause for these diseases." Collaborator Cagla Tukul and her team from Temple University determined that the presence of curli led to autoimmunity and arthritis--two conditions that are known complications of Salmonella infections in humans.

"In mice, these reactions were triggered within six weeks of infection, demonstrating that curli can be a major driver of autoimmune responses," said Tukul. The next step in the research is to confirm that this also occurs in humans, and test if other food-borne pathogens related to Salmonella can cause similar autoimmune reactions.

"This important discovery suggests that food-borne pathogens could initiate or worsen autoimmunity and have the potential to contribute to amyloid disorders such as Alzheimer's and Parkinson's disease," said VIDO-InterVac Director Dr Volker Gerdts. (ANI)

<https://www.devdiscourse.com/article/science-environment/1124589-scientists-demonstrate-salmonella-biofilm-protein-that-causes-autoimmune-responses>

Business Standard

Sat, 11 July 2020

Top govt scientists tell MPs Covid-19 vaccine at least a year away

Reliance of Indian pharma industry on Chinese APIs a 'huge strategic concern' with few short-term solutions, they say; meanwhile, CSIR says Covid offers a good opportunity to check brain drain

By Archis Mohan

New Delhi: The government's top scientists and officials on Friday told a parliamentary committee that a vaccine to cure Covid-19 could take at least a year to develop, and that they said was their most optimistic assessment.

The panel of lawmakers was told that India, a leading manufacturer of vaccines and generic medicines, with nearly 60 per cent of the world's vaccines developed here, is expected to play a key role in the worldwide race to develop a vaccine.

However, the reliance of Indian pharma industry on Chinese APIs (active pharmaceutical ingredients) was recognised as a "huge strategic concern" with few short-term solutions.

With some of the best Indian students unable to leave for studying in foreign universities because of Covid-19, the Council for Scientific and Industrial Research (CSIR) told the committee how this offered an opportunity to check brain drain.

The CSIR suggested increasing the number of post-doctoral research fellowships from 300 to 800 every year, starting from 2021, and also the number of PhD scholars through CSIR-NET examination from 5,000 to 7,500. The proposal would require an additional budget of Rs 2,388.22 crore over the next five years, it said.

The Department of Scientific and Industrial Research (DSIR) suggested setting up a "strategic think tank for science and technology" to plan for future pandemics, and also look into such moral and ethical questions as genome editing.

Only six of the 30 members of the parliamentary standing committee on science and technology, environment and climate change could attend its meeting on Friday morning.

This somewhat vindicated committee chairperson Jairam Ramesh's demand to Rajya Sabha Chairman M Venkaiah Naidu to allow virtual meetings of parliamentary committees.

All six who attended the meeting, including those from the Bharatiya Janata Party (BJP), were unanimous that virtual meetings should be allowed.

The committee met for three hours from 11 a.m. The topic of the meeting was 'science and technological preparedness for Covid-19 and beyond'.

Officials from the Department of Biotechnology, Department of Science and Technology, CSIR, DSIR, and Principal Scientific Advisor to the government K Vijay Raghavan briefed the MPs.

They shared details on the earliest possible availability of a vaccine, as also an overview on drugs and health equipment.



The topic of the meeting was 'science and technological preparedness for Covid-19 and beyond'

The committee was told by scientists that early 2021 is latest a vaccine could come up anywhere in the world, provided that all human trials are successful. However, general consensus was that even a year from now is an optimistic scenario.

On import of Chinese APIs by Indian pharma industry, officials said this was a policy challenge with no short-term solutions. Indian domestic pharma industry would need to invest in making APIs indigenously.

As a strategy for preparing for future pandemics, the DSIR recommended strengthening academic research and development (R&D) institutions. It said there was a need to set up advanced centres for excellence in areas of virology and infectious diseases.

It also suggested strengthening industry-academic partnership in R&D and innovation. It said that CSIR laboratories can be knowledge partners with industry in key areas.

It recommended promoting of start-ups and MSMEs (micro, small and medium enterprises) to increase “ease of doing science” and “ease of doing business” to accelerate translation of the know-how and knowledge base.

Members were informed that the CSIR is trying to promote rural entrepreneurship through its ‘tech@villages’ programme.

The ‘strategic think tank on S&T’ should be set up to look at policies that are dynamic, evidence based and suitable to the Indian milieu, the DSIR submitted in its presentation.

It said the think tank should consist of both young and experienced, with diversity of disciplines, including from social sciences. This would help in integration of health research and R&D in science and technology and adoption of digital technologies. It said India needs a strong digital policy framework for healthcare and S&T.

While the budget session of Parliament was truncated on March 23, neither have any of the 24 department related parliamentary standing committees held their meetings since. The first to take place was the meeting of the committee on petroleum on July 7.

After Friday’s meeting, Venkaiah Naidu tweeted that he was glad the committees have resumed functioning.

To this, Ramesh replied, “I would still request you, Sir, to allow virtual meetings given that Parliament is unlikely to meet for the next month at least.”

https://www.business-standard.com/article/current-affairs/top-govt-scientists-tell-mps-covid-19-vaccine-at-least-a-year-away-120071001233_1.html

ज्ञान प्रसार एवम् विस्तार
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Coronavirus COVID-19 vaccine news, latest update: India's vaccine candidates will go through rigorous evaluation process, says govt's scientific adviser

Coronavirus vaccine in India news, update: Human trial for India's first potential indigenous coronavirus COVID19 vaccine candidate COVAXIN will commence this week

New Delhi: Coronavirus vaccine in India news, update: In an encouraging development, K VijayRaghavan, Principal Scientific Adviser to Govt of India, said that India's COVID vaccine candidates will go through rigorous evaluation process that will not be compromised, PTI reported.

Earlier, it was reported that Indian Council of Medical Research (ICMR) is developing indigenous potential vaccine candidates — COVAXIN — for coronavirus in record time, scientist Nivedita Gupta working with the country's apex biomedical research body said. She revealed that ICMR wants the vaccine to be developed as fast as possible and does not want to "miss the bus". If ICMR goes into conventional methods to develop the vaccine and bring it out after two years then there is no use of it, she said. ICMR wants to fastrack the development process of the vaccine for coronavirus in order to make it available for people sooner rather than later, as per a PTI report.



Coronavirus vaccine in India news, update: Over 150 potential Coronavirus vaccines are being developed across the world. (Reuters image)

Human trial for India's first potential indigenous coronavirus COVID19 vaccine candidate COVAXIN will commence this week. Over 150 potential Coronavirus vaccines are being developed across the world even as top infectious disease expert of the US Dr Anthony Fauci has said he was cautiously optimistic over the possibility of developing a vaccine for COVID-19 by the end of this year or early 2021.

COVAXIN vaccine update status trial date

COVAXIN is being developed by the Indian Council of Medical Research (ICMR), National Institute of Virology, Pune, and Bharat Biotech. So far, ICMR has identified 12 sites for human trials for the vaccine. COVAXIN will be tested on 375 people for the first phase and then 750 in the later stages. Another potential coronavirus covid19 vaccine candidate, which is being produced by Zydus Cadila, has received approval for Phase I/Phase II trials.

Coronavirus vaccine Oxford, Coronavirus vaccine Moderna

Around the world, 125 potential COVID19 vaccines are at the preclinical phase, 15 coronavirus vaccines are at Phase 1, 10 are at Phase 2, 4 are at Phase 3. A vaccine produced by the University of Oxford and AstraZeneca has so far shown positive results. Dr Anthony Fauci has also revealed that a vaccine being developed by US-based Moderna has shown promising results.

Canada-based Medicigo has announced a Phase I trial for its vaccine, Maryland-based Novavax has stated that it would get the US government funding. Japan company AnGes has begun Phase I/II trials.

A Chinese vaccine candidate for coronavirus has moved into Phase II human trials. The potential vaccine is being developed by China's Chongqing Zhifei Biological Products, Anhui Zhifei Longcom Biopharmaceutical, and the Institute of Microbiology of the Chinese Academy of Sciences. However, the Chinese firm did not provide details of the trial design or results of Phase I

test of the experimental vaccine. A vaccine by CanSino Biologics in China was approved for military use. Chinese company Sinovac Biotech has moved into Phase III trials.

How vaccines are developed and approved

The testing of vaccines goes through a rigorous trial process before it is being developed. There are five stages- Preclinical Testing, Phase I Safety Trial, Phase II expanded trial, Phase III efficacy trial, and Approved. During the Preclinical Testing, a vaccine is applied to mice or monkeys. During the Phase I Safety Trial, the vaccine is given to a small number of people for safety and dosage. During the Phase II expanded trial, a vaccine is given to hundreds of people by splitting them into age and gender groups. During the Phase III efficacy trial, people are given the vaccine to test the efficacy limits. If a vaccine shows promising results in the aforementioned stages, it gets approval from regulators of the country where the Human or Clinical Trial has taken place.

<https://www.financialexpress.com/lifestyle/health/coronavirus-vaccine-for-covid19-in-india-covaxin-zydus-cadila-oxford-moderna-news-latest-update/2018405/>



Sat, 11 July 2020

Russian Defense Ministry's clinical trials of COVID-19 vaccine enter final stage

Results of the COVID-19 vaccine tests, performed on a group of volunteers in Russia, show that they are developing immunity to the coronavirus, the ministry said

MOSCOW, July 10. /TASS/. The Russian Defense Ministry and the Gamalei National Research Center for Epidemiology and Microbiology have started the final stage of clinical trials of a vaccine against the novel coronavirus, the ministry stated on Friday.

According to the Defense Ministry, "an in-ward treatment of the first group of volunteers, who were tested for the safety and tolerability of the vaccine, will end on July 15."

"On Monday, July 13, the second group of volunteers, who are tested for the efficiency and immunogenicity of the vaccine, will be injected with the second component of the vaccine against the coronavirus," the ministry stated.

"The booster scheme of the vaccination, which is intended for the second group of volunteers, will enable to strengthen the immune system and will also prolong its endurance," according to the ministry.

The ministry also added that all volunteers feel well, have no complaints; they experience no side-effects at all and the first group of volunteers would be discharged from the Burdenko Military Hospital after undergoing the final tests.

Results of the COVID-19 vaccine tests, performed on a group of volunteers in Russia, show that they are developing immunity to the coronavirus, the ministry continued.

"In line with the research protocol, volunteers regularly take tests for antibody and cell-mediated immunity," the ministry stated. "The data obtained by the Gamalei National Research Center for Epidemiology and Microbiology, proves that volunteers of the first and second groups are forming an immune response after injections of the vaccine against the coronavirus."

The Defense Ministry announced in early June that two groups of volunteers had been selected for the clinical tests of an anti-coronavirus vaccine. The first group of 50 servicemen includes five women and ten medics. The second group is comprised of civilians.

Clinical testing of the vaccine developed by the Gamalei National Research Center for Epidemiology and Microbiology began on June 18. Eighteen volunteers were vaccinated against the novel coronavirus.

COVID-19

In late December 2019, Chinese officials notified the World Health Organization (WHO) about the outbreak of a previously unknown pneumonia in the city of Wuhan, in central China. Since then, cases of the novel coronavirus - named COVID-19 by the WHO - have been reported in every corner of the globe, including Russia.

On March 11, 2020, the WHO declared the coronavirus outbreak a pandemic. According to the latest statistics, over 12,390,370 people have been infected worldwide and more than 557,400 deaths have been reported. In addition, so far, over 7,220,650 individuals have recovered from the illness across the globe.

To date, over 707,300 coronavirus cases have been confirmed in Russia, with 481,316 patients having recovered from the disease. Russia's latest data indicates 10,843 fatalities nationwide. Earlier, the Russian government set up an Internet hotline to keep the public updated on the coronavirus situation.

<https://tass.com/society/1176785>

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COVID-19 vaccine: 'Cautiously optimistic over vaccine development by early 2021', says Fauci

The early data on these trials have a cautious optimism that we will be successful at least in developing a vaccine with some degree of efficacy by the end of the year, beginning of 2021, he said

United Nations: America's top infectious disease expert Dr Anthony Fauci has said that he is cautiously optimistic over the results from the current clinical trials and the possibility of developing a vaccine for COVID-19 by the end of this year or early next year.

Fauci, the National Institute of Allergy and Infectious Diseases Director, said that the coronavirus will likely to continue to emerge, and global collaboration and transparency are critical to deal with the future pandemics.

"The lessons we've learned from the coronavirus is they have pandemic potential, they're likely to continue to emerge. Good public health measures are critical to controlling them. Global collaboration and transparency are critical if we are to get a containment of this extraordinary assault on the human population, a viral disease that spreads rapidly and as a high degree of morbidity and mortality, he said in his recorded remarks during an online session on 'Confronting COVID-19 Through Innovation and Research: Lessons Learned from the Pandemic'. The event is part of a series of online dialogue by the United Nations Academic Impact (UNAI) dubbed '75 for UN75: 75 Minutes of Conversation' that brings together academics, researchers and students from around the world.

Giving an overview of the pandemic and efforts to develop a vaccine, Fauci said: we've adapted a strategic approach to get multiple candidates and there are more than one candidate vaccine to be conducted in trials in a harmonised way so that we use standard endpoints, standard and single data and safety monitoring board as well as identical immunological parameters that are measured, so that you could bridge one study to another.

There are a number of vaccine candidates already in clinical trial and a few out of those candidates have completed phase 1/2 status, he said, adding that there are trials that will be going into phase three sometime at the end of July and then others will follow in the months of August, September and October.

Fauci said hopefully we'll be able to get some information, such as with this particular one representative vaccine that we started here in January. Phase one looks good, very promising data

on the induction of neutralising antibody and will go into trial at the end of July . There are 5-7 candidates that are going into clinical trials at different stages, he said.

The Moderna coronavirus vaccine is showing promising results, "which makes me cautiously optimistic. Although you can never, ever predict with any certainty, whether a vaccine is going to be safe and effective.

The early data on these trials have a cautious optimism that we will be successful at least in developing a vaccine with some degree of efficacy by the end of the year, beginning of 2021, he said.

Moderna said that it has completed enrollment of Phase 2 Study of its mRNA vaccine against COVID-19, adding that it has finalised the Phase 3 study protocol based on the feedback from the US Food and Drug Administration (FDA).

The randomised, 1:1 placebo-controlled trial is expected to include approximately 30,000 participants and is expected to be conducted in collaboration with the National Institute of Allergy and Infectious Diseases, subject to regulatory approval.

Moderna has completed the manufacture of vaccine required to start the Phase 3 study and the company remains on track to be able to deliver approximately 500 million doses per year, and possibly up to 1 billion doses per year beginning in 2021 from the company's internal US manufacturing site and strategic collaborations, the biotechnology company added. According to Johns Hopkins Coronavirus Resource Center, the contagion has infected over 12 million people and killed more than 549,000 across the world.

The US is the worst affected country with over 3 million cases and more than 1,32,000 deaths. The COVID-19, which originated in China's Wuhan city in December last year, has also battered the world economy with the International Monetary Fund saying that the global economy is bound to suffer a "severe recession".

Scientists are racing against time to find a vaccine or medicine for its treatment.

<https://www.timesnownews.com/health/article/covid-19-vaccine-cautiously-optimistic-over-vaccine-development-by-early-2021-says-fauci/619323>

