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# समाचार पत्रों से चयित अंश Newspapers Clippings

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

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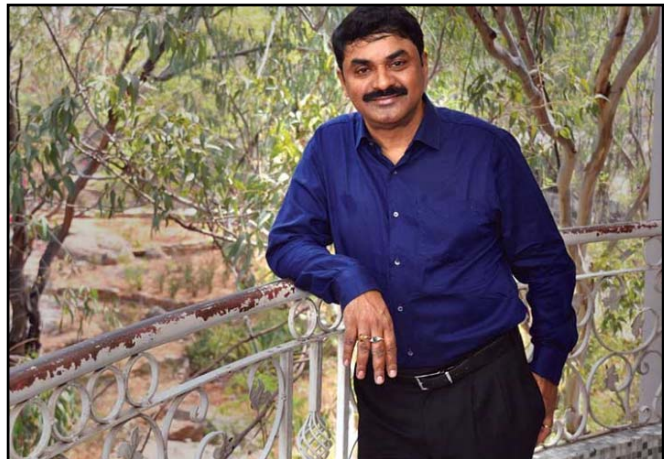


Mon, 12 April 2021

## Progress that we have made in Defence R&D is creditable, Says DRDO Chairman

Dr. G. Satheesh Reddy is Chairman, Defence Research and Development Organisation (DRDO) and Secretary, Department of Defence Research and Development (DDR&D), Government of India. Prior to his appointment as DRDO Chairman, he was Scientific Adviser to Defence Minister (SA to RM). From a young navigation scientist and System Manager he rose steadily and after his multiple significant appointments and decades of sustained contributions to Defence R&D, was elevated as Distinguished Scientist in Sep 2014 and was appointed as Scientific Adviser to Defence Minister in May 2015.

He holds the distinction of being inducted as Fellow of Royal Institute of Navigation (FRIN), London, Royal Aeronautical Society, UK (FRAeS) and Foreign Member of the Academy of Navigation & Motion Control, Russia. He is an Honorary Fellow of CSI & Project Management Association of India, Fellow of Indian National Academy of Engineering, IET (UK), Associate Fellow of American Institute of Aeronautics & Astronautics, US and many other Academies/scientific bodies in the country and abroad. For his distinguished contributions, Dr Satheesh received several prestigious international and national awards



*DRDO is constantly encouraging industry participation through various policies and initiatives to leverage their strengths in production and manufacturing as well as tie-ups with Academia for technologies and applied*

Dr G Satheesh Reddy, Chairman, DRDO in a candid conversation with Ajit K Thakur, Editor, Raksha Anirveda details out on how his organisation has progressed over the years in developing various defence systems and platforms including missiles, how it is working with various stakeholders in achieving India's self-reliance in defence technology and defence manufacturing. Excerpts:

**RA: DRDO, being a premier defence R&D organisation has dedicated itself towards enhancing self-reliance in defence systems. How does DRDO see its role evolving in this context, its achievement so far and the impact it has made to transform the Indian defence sector?**

**SR:** Defence Research and Development Organisation (DRDO) with its mandate to develop defence systems and products required for Indian Armed Forces has been the torch bearer of

indigenous development of cutting edge defence technologies in the country. Technologies developed by DRDO are transferred to Indian Industries along with the relevant 'know-how' and handholding support for production.

So far, DRDO has made the country self-reliant in defence systems by indigenously developing equipment such as Missiles, Fighter Aircraft, Tanks (Armoured Fighting Vehicles), Multi-barrel Rocket Launcher, Electronic Warfare Systems, Radars, Air Defence System, Naval Systems, Life Support & Survivable Systems and other world class products giving a quantum jump to India's military might.



Airborne Early Warning and Control (AEW&C) System

Some major technological breakthroughs are Main Battle Tank Arjun Mk1 & Mk1A, Tejas LCA, Active Electronically Scanned Array Radar, Sonars for submarines and EW systems, AEW&C and Advanced Towed Artillery Gun System (ATAGS) etc. Recently demonstrated capabilities are ASAT, HSTDV, QRSAM, SMART, HELINA, MPATGM, Quantum Communication etc. are some of the major breakthroughs for the country. DRDO has successfully developed and flight-tested the long-range subsonic cruise missile. LCA Navy programme recorded significant milestone by conducting arrested landing and take-off from INS Vikramaditya.

While developing various technologies and products, DRDO has facilitated development of a large number of private industries, which have become important part of domestic defence industry ecosystem in the country. A number of industry friendly policies have been initiated to support the indigenous development as well as manufacturing, like simplification of procurement procedures, faster execution of ToTs, handholding of industry, removing the royalty etc. The growth of domestic sector will lead to self-reliance, reduction in imports and thus making PM's dream of Atmanirbhar Bharat a reality. DRDO is partnering with many academic institutes, research and development Startups, and the industry to work on advanced and futuristic technologies to make India self-reliant and transform the Indian defence sector. Several new schemes have been introduced to draw more youth to the defence sector. These include introduction of relevant courses at undergraduate and post-graduate levels, opening of nine centres of excellence for working in directed research for defence technologies and initiation of new schemes to provide paid apprenticeships for the students.

**RA: The indigenous Air Independent Propulsion (AIP) System for submarine after successful tests has reached the stage of maturity for fitment into target vessels. Similarly, the success of indigenous A-SAT missile programme (Mission Shakti), helped India enter the elite club and augment its deterrence capabilities. Both the achievements showcased DRDO's agility and performance with precision. Kindly elaborate both on AIP and Mission Shakti.**

**SR:** DRDO achieved a major milestone towards Atmanirbhar Bharat with the completion of full load long endurance trial of Air Independent Propulsion (AIP) for submarines of Indian Navy. This helps in enhancing the submerged endurance of the boat several folds. As compared to other types of AIP systems available, fuel cell-based AIP is unique as the hydrogen is generated onboard. It is capable of giving endurance of up to several days compared to a conventional submarine. The AIP technology is likely to make the submarines stealthier and harder to detect underwater as they will not be coming out of water frequently to get the air supply. The development of indigenous fuel cell-based AIP technology will help India move closer to becoming self-reliant in building its own propulsion system for indigenous submarines.

Mission Shakti or the ASAT mission was successfully conducted by DRDO on March 27, 2019 with a new Ballistic Missile Defence (BMD) interceptor against a live orbiting satellite in the Low Earth Orbit (LEO) in a "Hit to Kill" mode. The interceptor missile was a three-stage missile with a "Hit to Kill" capable Kill Vehicle (KV). A low orbit of around 300 Km was chosen for the

demonstration in order to avoid the threat of debris. It was technology capability demonstration. With the successful demonstration of ASAT, India has come at par with the elite club of US, Russia and China who possess the Anti-Satellite (A-SAT) Capability.

**RA: With the success of LCA programme, India is confidently moving ahead for its next generation Jets- AMCA prototype and Tejas Mk2 (Design and Development). How much time it's going to take and will it be ready within the specified timeline?**

**SR:** The success of LCA programme is a collaborative effort, where Aeronautical Development Agency (ADA), Bengaluru, under the Department of Defence R&D, Government of India, is the nodal agency for the design and development and HAL is the production partner with participation of DRDO and CSIR Laboratories, Public & Private sector industries and academic institutions. Now that the core technology is ready, it will act as a catalyst for several other projects that are lined up, to move faster.

Tejas Mk-II is in advance stages of development. After completion of aircraft design, the detailed design activities are nearing completion. Manufacturing of long lead parts has already begun and the first prototype is on schedule for rollout. Since there are very few unknowns in the programme, activities are moving rapidly.

Advanced Medium Combat Aircraft (AMCA) is a 5<sup>th</sup> generation twin engine fighter aircraft in the medium weight category. The configuration of AMCA is frozen and the configuration design is completed. LCA-Tejas Programme has given a significant lead in building the aircraft and its technology development within our country. ADA is confident in taking the Design and Development activities to the next stage. The detailed design activities have commenced. Indian industries are already participating in the development activities like manufacturing of a full-scale model for stealth measurements. We are sure of meeting the set deadlines.

**RA: Artificial Intelligence is gaining traction and is now being widely used in unmanned reconnaissance aircraft, the unmanned ground combat vehicle, and the unmanned submersible systems. Similarly, cognitive electronic warfare (CEW) is emerging as the technology of the future. How well India is progressing in these two areas? Provide an account of the work being done by DRDO in AI and CEW.**

**SR:** DRDO laboratories in Bengaluru, like Centre for Artificial Intelligence and Robotics (CAIR) and Young Scientists Laboratory DYSL-AI are working in the area of Artificial Intelligence. CAIR has developed robots with various applications like Mobile Autonomous Robot System (MARS), Robot Sentry etc. The offshoot of AI development was applied during the pandemic for developing Smart Automated Management of Patients and Risks for COVID-19 (SAMPARC) and AI based non contact facial features based product named "Attendance Application (AINA)". Some other important AI based systems that have been developed are Daksh Remotely Operated Vehicle (ROV), Knowledge Resources and Intelligent Decision Analysis (KRIDA), a system that aims to facilitate large scale military moves using extensive knowledge base and data handling, Robot Sentry or RoboSen which is a "mobile robot targeted at patrolling and surveillance applications in urban campuses" is going to be game changer in surveillance.



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Cognitive Electronic Warfare (CEW) refers to the use of cognitive systems like artificial intelligence (AI) or machine learning to enhance development and operation of electronic warfare technologies by the defence services. A young scientist laboratory DYSL-CT at Hyderabad is working on cognitive technologies.

Using CEW techniques, autonomous decisions in response to changing situations can be made, and new and unknown radar signals can be dealt with. By using CEW techniques, a radar system would be able to perform its assigned task optimally by perceiving its operational environment, fine-tuning and adjusting its emission parameters, such as the pulse width, pulse repetition interval, and transmitter power etc.

CEW technologies are being integrated by DRDO scientists in the areas of image processing, face recognition system and explosive detection etc., which is a sure means of enhancing our security systems more effectively and comprehensively.

**RA: DRDO covers wide spectrum of Defence Research & Development as per the requirements laid down by the three services. Yet it is perceived that it has not come at par with its world counterparts and it has been a challenge for DRDO to fix most of its programmes due to the cost and timeline factor and also to make itself more nimble towards innovation. Your comments.**

**SR:** DRDO has been carrying out R&D activities in self-sustainable technologies for our Armed Forces. The enormous achievements of DRDO have put our country in select club of nations possessing technological capabilities like hypersonic missile with a scramjet engine and A-SAT technology. Presently, India is ready to take up the challenge of developing any new technology in

defence indigenously with the scientific ecosystem developed by DRDO. Development of systems like MBT Arjun Mk I fighter jet initially had technological challenges which demanded arduous efforts. However, DRDO has developed its expertise over the years and is now upgrading these systems to new generation with advanced features. The expertise and experience developed over the years is being used for new warfare technologies like development of combat UAV with advanced and complex features, swarm drones, artificial intelligence, cyber defence, quantum communication, computing and advanced smart materials etc. It must be appreciated that DRDO has been doing its R&D amid a huge void of any other institute or industry doing R&D in the defence sector, unlike other big industrial nations where private houses not only invest huge capital in the same but run consortiums in conjunction with other countries and institutions. Apparently, this handicap has not been appreciated by our defence community as well as think tanks and hence a misplaced perception. In fact, I feel the progress that we have made is creditable.



HELINA anti-tank missiles were launched from ALH Dhruv helicopter for evaluating missile capabilities in minimum and maximum range of 7 kms

**RA: What steps are being taken by DRDO to create a robust and vibrant ecosystem in Defence R&D and production in collaboration with DPSUs and Indian Private sector companies? Do you think that Indian defence sector is well positioned now to see the start and experience competitive and collaborative R&D play between DRDO and the private sector players?**

**SR:** DRDO currently aims to concentrate on futuristic and cutting edge defence technologies. DRDO does not enter and work in the areas where DPSUs and Indian private sector companies can develop products for defence forces. DRDO has opened up test facilities to the industry and today we have more than 1,800 partner companies working for various projects. Our endeavour is to have

no imports of missiles, radars, sonars, torpedoes, armaments and early warning systems etc., where we have achieved self-reliance.

With the help of DRDO's various initiatives and ToTs, a number of private companies have been transformed from simple fabricators to defence and aerospace manufacturers. We are aiding the industry by offering our technologies for early realisation of products and at the same time providing our R&D facilities.

DRDO also providing support to technological Startups through the Technology Development Fund (TDF) scheme. A policy has also been introduced for identifying Development cum Production Partners (DcPP) on a competitive basis from both private and public industry for development of systems to involve industry from initial stage of development. Measures are taken to waive off 'Performance Security' for development contracts as major step in aiding the efficiency of the industry. Indian defence sector is very much ready and enthusiastic about increasing collaborative R&D activity with DRDO.

**RA: What's your vision to position DRDO as a futuristic R&D organisation amid stagnant budget and little room for executing the big ticket research projects? How do you plan to bring in the result-oriented change despite budgetary constraints?**

**SR:** As compared to the previous year's defence budget allocation, this year witnessed an increase of 4.78 lakh crore which includes capital expenditure worth Rs. 1.35 lakh crore. This is the highest ever increase in the capital outlay for defence in the last 15 years. The capital allocation for DRDO has also been increased.

Thus, the way government is supporting with additional funding, budget was never a constraint for development of critical equipment. Our scientists are dedicatedly working towards progressive enhancement of self-reliance in defence systems and also enhancement of R&D infrastructure and capability of the country. Our vision is to make the country self-reliant and independent of foreign technologies in critical spheres and also to build a reservoir of expertise in the most sensitive scientific and technological areas of defence systems.

DRDO is also working on the large development programmes like AMCA, LCA Mk II, long range Radars, advanced missile technologies, Arjun Mk II etc, towards meeting the user requirements. DRDO is constantly encouraging industry participation through various policies and initiatives to leverage their strengths in production and manufacturing as well as tie-ups with Academia for technologies and applied applications.



The naval prototype of the Light Combat Aircraft (LCA) Tejas seen taking off from INS Vikramaditya

**RA: According to DRDO's many critics, jet/aero engine has been the biggest failure of DRDO. Do you agree with the viewpoint? What is the current status of jet engine/aero engine development programme? Do you think that international collaboration with global OEMs for joint co-design and development is imperative to ensure success?**

**SR:** While developing aero engine, a number of milestones have been achieved. There is nothing like failure in technology development. Aero engine development is a complex process. It requires entire ecosystem of academia, industry and R&D to develop aero engine of high thrust category. With the development of Kaveri engine, certain level of technological maturity has been achieved in the academia, industry and R&D institutions of the country for some categories of aero engines. Institutional collaboration is one of the options available to work and hasten the development. Today, we are in the advance stages of developing an indigenous engine for Nirbhay – Long Range Sub-Sonic Cruise Missile. Kaveri dry engine is also getting tested for unmanned aerial vehicles. Some ground tests are being done and other tests are scheduled as per plan. These developments can be extended to marine applications also.

**RA: There are some limitations that seriously haunts our recent policy measures and initiatives in context of innovation and indigenisation in our defence sector. In your opinion, what steps are required/ being taken to fix these for making significant substantial progress?**

**SR:** Current Government policy is directed to reduce the dependence on import in defence system and to make the country self-reliant in manufacturing defence equipment. Policy initiatives like "Make in India" and "Atmanirbhar Bharat" have shifted the focus to development and production of indigenous defence equipment. Further, there is a push from the government to encourage private industries into major defence equipment manufacturers with vocal for local call. The Ministry of Defence (MoD) has released a list of 101 systems which will be barred from import and have to be produced indigenously. We must produce state-of-the-art home-grown weapon systems rather than importing them from outside.

To boost the indigenous defence ecosystem, DRDO has released a list of 108 defence systems and sub-systems which will be manufactured exclusively by Indian industries. We have also opened our test facilities and over 450 patents have been made available free to industry so as to extend our support to the indigenous manufacturers and developers.

A number of policies have also been promulgated to encourage and support the indigenous manufacturing and development such as faster execution of ToTs, handholding of industry, removing royalty etc. As already stated, support to Technological Startups with the provision of Technology Development Fund (TDF) is a big step empowering the Indian R&D.

**RA: Despite having the talent and expertise, India hasn't been successful in its indigenous UAV programme as compared to Turkey and others. How can DRDO reverse this trend in near future? Kindly provide insights.**

**SR:** Like elsewhere, in India too, we have an ecosystem for development of advanced UAV. DRDO has developed various UAVs like NISHANT, LAKSHYA, ABHYAS etc. DRDO laboratory Aeronautical Development Establishment (ADE), Bengaluru is working on many



*Our thrust would be on developing an ecosystem, where there is a total focus on integration and innovation and to become a defence exporter. DRDO will be responding ably to the future war fighting requirements of the tri services with advanced technologies*



UAVs. A dedicated test range for flight testing and evaluation of UAVs has been established at Chitradurga.

Besides, our laboratories CAIR and R&DE(E) are also working on development of various kind of robots and the young scientists' laboratories are also working on the technologies required for UAVs and robotics. A MALE (medium-altitude long-endurance) UAV with an operating altitude of 30000 ft, endurance of 24 hrs with EO and SAR payloads is in advanced stage of development. It can carry a variety of payloads as per mission requirement. Designed to perform intelligence, surveillance, reconnaissance missions for Indian Armed Forces. Its mission requirements are to provide continuous wide area coverage and yet be able to identify small targets. Abhyas is a low-cost expandable aerial target for practice firing by Armed forces. It has enormous potential. Apart from this, many Startups have been nurtured by DRDO to take up this challenge and develop advanced UAV systems for both surveillance and combat operations.

**RA: DRDO has proposed Light Tank for the Indian Army's Mountain Corps. What is the USP and Delivery Timeline If It Gets Acceptance?**

**SR:** Indian Army's need for light tanks has been there ever since we phased out PT-76. It is even more critical now, not only for mountainous and high altitude of Northern area but also the marginal terrains of Rann & Siliguri corridors. DRDO has worked out the configuration and other possible parameters and other requirements of Indian Army and is continuously in talks with industry partners to develop a light or medium-weight tank that could be used in areas as mentioned. The proposed light tank for the Indian Army will be fitted with High Altitude Operable Power pack (Engine + Transmission) and will be capable of firing multiple ammunition. This tank may be called as "highest altitude operable tank. It is possible to meet the time lines as required with the industry partnership.

**RA: India ranks 52<sup>nd</sup> in global innovation index and contributes to only 2.7 per cent in the global R&D. India accounts for only 1.4 per cent of the global arms trade and in the top 100 arms exporting companies, only three Indian companies find place in the list. What do you think of the weakest point in our R&D sector that restricts our indigenous project not getting substantial platform within our industries along with India's emergence as a prominent player in global arms trade? Tell us more about your next generation technologies and future defence manufacturing programs including few important statics/outlays for 2021-2024.**

**SR:** Defence PSUs have been traditionally nominated to produce weapon systems because required infrastructure for large scale integration was not available in private sectors till a few years ago. The integration requirements for weapon system are capital intensive; which was one of the deterrence for participation of private industries in these fields. However, with the 'Make in India' policy more and more private industries are willing to invest. We will be offering our technologies to industries for an early realisation of products and also to support R&D facilities in the industries. I am optimistic about the weapon systems being produced by the private industries in near future.

We are working on the cutting-edge technologies, which will be required for futuristic weapon systems. DRDO is concentrating on research in advanced technology areas like Artificial Intelligence, Smart Materials, Quantum technology, Asymmetric technologies and Cognitive Technologies. A number of activities pertaining to various systems like AEW&C, AMCA, Guided Pinaka, Radar systems, Missile systems, Underwater unmanned systems are planned. Many more new innovations are lined up for the decade like Next Gen Advanced Medium Combat Aircraft (AMCA), LCA AF Mk II, long range Radars, advanced missile technologies, Arjun Mk II etc. Our scientists are working jointly with academic institutes on futuristic technologies like cyber security, space and artificial intelligence. We plan to strengthen our manufacturing base by enabling Indian industry through their involvement as partners. We would be engaging them as the development-cum-production partner from the beginning of the project. This will help in easy transfer of technology and will cut down the development cycle time. Our thrust would be on developing an ecosystem, where there is a total focus on integration and innovation and to become a defence

exporter. DRDO will be responding ably to the future war fighting requirements of the tri services with advanced technologies.

<https://www.raksha-anirveda.com/progress-that-we-have-made-in-defence-rd-is-credible-says-drdo-chairman-2/>

## STAR OF MYSORE

Sat, 10 April 2021

# Gaganyaan, India's first manned space mission: DFRL's pouch technology to prevent food waste in space

Mysuru: When India's first crewed space-flight 'Gaganyaan' lifts off next year, commencing a new era of space exploration, the astronauts on-board will not only carry a selection of special foods developed by Mysuru-based Defence Food Research Laboratory (DFRL) but also they can prevent food from being wasted. In developing indigenous technology to prevent food waste, the DFRL is promoting Aatmanirbhar Bharat.

'Gaganyaan' has been designed to carry three Indian astronauts to the low earth orbit — an orbit of 2,000 kms or less — for a period of five to seven days. The DFRL, a unit of Defence Research and Development Organisation (DRDO), has already readied the food to be consumed by astronauts and has sent them to Indian Space Research Organisation (ISRO).



The menu will offer Indian astronauts — hand-picked fighter pilots from the Indian Air Force (IAF) who are at present undergoing training in Russia — a variety of options to suit their palate during the seven-day mission. They are being trained at the Yuri Gagarin Research and Test Cosmonaut Training Centre at Star City near Moscow.

Their menu includes egg rolls, veg rolls, idli, vegetable pulav, chicken biryani, dal makhni, shahi paneer and chicken korma. Nutrition bars, powdered fruit juice, almonds and nuts and instant tea mix are a part of the food package along with moong dal halwa, sooji halwa and dried apricot. The eatables can be warmed using the food warmers on board the spacecraft.

After the food was developed, the challenge before DFRL was to prevent food waste in space. To tackle this, scientists have come up with patented food-waste pouch system. According to highly-placed sources, the food pouch would restrict the growth of microbes and prevent food from getting spoilt even in the space atmosphere.

The food will be put into specially designed packages from where moisture has been removed and can be eaten after filling the packets with water. The DFRL had to develop this technology as preserving Indian food in the outer space was tricky and there is no pre-existing technology for this.

It is a first-ever mission for India and had to be different from the technology used by Russian and American astronauts who consumed food like burgers and sandwiches that are popular in the Western world. The challenge for DFRL scientists here was to develop a technology to preserve the Indian food that had high moisture content when compared to burgers and sandwiches. To tackle the tricky situation, the DFRL has come up with the food waste pouch technology where a special compound has been developed that would restrict the growth of microbes. Prevention of microbe growth on food would prevent spoiling of the food.

DFRL sources said that they have focused on nutrient adequacy and wholesomeness of the food. Low fragmentation is equally critical in the zero-gravity environment and food will be packed in 100 grams to 200 grams packets that will ensure zero microbe standards.

The astronauts will eat three meals a day, with the diet adding up to 2,500 calories. “The idea is to give them balanced meals that are lightweight, low volume and easy to consume. Food kits include special straws for drinking water and instant coffee or tea, food warmers and waste restraining bags. Special containers — sippers — have also been developed to enable the astronauts to have liquids such as fruit juice and water as well.

<https://starofmysore.com/gaganyaan-indias-first-manned-space-mission-dfrls-pouch-technology-to-prevent-food-waste-in-space/>



*Sat, 10 April 2021*

## **INS Vikrant to get LRSAM Cover Soon**

India’s indigenous aircraft carrier 1 (IAC 1) INS Vikrant will soon be getting air defence cover from the long-range surface-to-air missile (LRSAM) system after the Navy started integration work of the missile system onboard INS Vikrant. The LRSAM is a joint development by the IAI and the DRDO that has a range of 70+km and offers broad aerial and point defence against a wide range of threats to the marine arena from the air, sea, or land.

INS Vikrant will also be getting DRDO developed Vertical Launch Short Range Surface to Air Missile (VL-SRSAM) that will supplement the LRSAM system for intercepting aerial threats to the aircraft carrier. VL-SRSAM has a range of 40km and they are talks of DRDO working on an extended LRSAM-ER variant for the Indian Navy which will feature an additional booster stage that will enable it to take down aerial targets at a range of 150+km.



INS Vikrant successfully passed basin trials last year and the Navy is about to commence Sea Trials. In Basin trials, all four Gas Turbines, main engines, and the Power Generation Systems comprising of eight Diesel Alternators were fired up for the first time that proved the propulsion, transmission, and shafting systems.

<https://www.eletimes.com/ins-vikrant-to-get-lrsam-cover-soon>

## **Did IAF Chief fly SU-30MKI fighter jet to check on latest upgrades including BrahMos & MICA missiles?**

Indian Air Force (IAF) Chief RKS Bhadauria flew a Sukhoi SU-30MKI in Bengaluru on Thursday to witness the fighter jet's "capability enhancement", IAF said in a tweet.

While the service did not explain what this "capability enhancement" is all about, there is speculation that the IAF chief took stock of the upgrades made on the aircraft to carry home-grown weapons such BrahMos supersonic cruise missile, RUDRAM anti-radiation missile besides the European MICA air-to-air missile. The SU-30MKI was modified to carry the nuclear-capable BrahMos, considered the world's fastest supersonic cruise missile.

Amid the border standoff with China, IAF had in October 2020 carried out a successful test-firing of the DRDO-developed air-launched BrahMos missile from a Sukhoi-30 jet in the Bay of Bengal. In the same month, RUDRAM was test-launched from the aircraft. The RUDRAM is India's first home-grown anti-radiation missile, developed by Defence Research and Development Organisation (DRDO). Prior to that, in August, the Air Force had test-fired the multi-target MBDA MICA missile from the Sukhoi-30 MKI.

"CAS (Chief of Air Staff) visited Bengaluru and interacted with the test crew of Aircraft & Systems Testing Establishment (ASTE) & software engineers of Software Development Institute," IAF tweeted on Thursday.

"He reviewed ongoing projects & flew a Su-30MKI to witness the capability enhancement on successful completion of one such project," the Air Force said. The Air Chief Marshal also reviewed the ongoing projects.

The ASTE is tasked with conducting flight testing of aircraft, airborne systems, and weapons prior to their induction into the IAF.

### **The Su-30MKI Multirole Fighter**

Developed by Russia's Sukhoi and built under license by India's Hindustan Aeronautics Limited (HAL) for the IAF, the Sukhoi Su-30MKI, is a twin-engine multirole air superiority heavy, all-weather, long-range fighter jet.

The Su-30MKIs are the frontline aircraft of the IAF. With a top speed of 2120 kmph and takeoff weight of 38,800 kg, the fighter jet can carry a wide range of equipment from radars to missiles and rockets. The fighter jet can be equipped with a variety of medium-range guided air-to-air missiles with active or semi-active radar or infrared homing close-range missiles.

The multi-role fighter can also be used for nuclear strikes. Its super-maneuverability not only provides unmatched superiority in a dogfight but is considered as one of the most powerful 'air superiority jets' in the whole of Asia.

The Su-30 MKI has a range of 3000 km with internal fuel that can sustain for nearly four hours, a good enough time during combat missions. It can also be refueled midair.

The IAF operates around 272 Su-30MKI jets. India is the largest operator of the export-oriented Su-30MKI multirole fighters in the world. The Indian Su-30MKI reportedly possesses advanced Israeli avionics and electronic warfare systems, making them different from the standard Su-30s.

The fighters have been a vital part of India's aerial strength possessed, and are looked at as a strong option to secure the country's boundaries alongside the French-made Rafales, which are the latest aircraft acquired by the nation.

In February, Sergei Kornev, an official from Russia's state arms seller Rosoboronexport, said India and Russia were in talks to modernize the IAF's Su-30MKI fighter jet fleet.

<https://eurasianimes.com/did-iaf-chief-fly-su-30mki-fighter-to-check-on-its-upgrades-for-brahmos-mica-missiles/>

## THEWEEK

Sat, 10 April 2021

# Is South Korea's new KF-21 fighter similar to India's AMCA stealth jet?

*South Korea on Friday unveiled the prototype of its new '4.5 generation' fighter'*

South Korea on Friday unveiled the prototype of its new '4.5 generation' fighter dubbed the KF-21 *Boramae* (young hawk trained for hunting), nearly 20 years after the project to build it was announced.

A fighter of the 4.5 generation is classified as having high manoeuvrability, advanced weapons for air-to-air and air-to-surface missions, features to reduce radar signature and integration of radar and infra-red sensors. A 4.5 generation fighter carries its weapons on external hardpoints on the wings and fuselage, unlike 5th generation aircraft that have internal weapons bays to increase stealth.



The KF-21 | Reuters

South Korean President Moon Jae-in and Indonesian Defence Minister Prabowo Subianto were among the key participants at the launch of the fighter.

In 2001, then South Korean president Kim Dae Jung had pledged to develop an indigenous fighter for the country by 2015 to replace its fleet of F-4 and F-5 aircraft.

In 2019, reports emerged Indonesia was backtracking on its commitments to the KF-21 project. Indonesia had agreed to provide \$1.3 billion to buy 48 aircraft and also secure transfer of technology for it. However, Indonesia has provided only around \$202 million so far, *Yonhap* reported. South Korea and Indonesia are continuing talks on the project.

### History of KF-21

The formal development of the KF-21 fighter began in late 2015. According to South Korea's *Yonhap* news agency, the country had allocated \$7.9 billion to develop and build 120 KF-21 fighters.

The KF-21, a twin-engine aircraft, is capable of carrying up to 7.7 tonnes of weapons and fuel under its wings and fuselage.

The first flight of the KF-21 is expected to be completed in 2022. The KF-21 resembles the US F-35 stealth fighter outwardly. South Korea is a user of the F-35, and the KF-21 has been touted as a "cheaper, less-stealthy alternative" to the US jet.

The current variant of the KF-21 does not feature an internal weapons bay, but future variants could have it. "Based on this 4.5 generation platform, South Korea will be capable of building more advanced versions down the road," professor Bang Hyo-Choong of the Korea Advanced Institute of Science and Technology (KAIST) told *Yonhap*.

South Korea is purchasing air-to-air missiles for the first KF-21 batch from European companies MBDA and Diehl BGT.

South Korea has adopted a phased development approach to building the KF-21. "The KF-X Block I will not have an internal weapons carriage, which is planned for subsequent production blocks. The initial version will also lack air-to-ground striking capability since the home-grown

long-range air-to-ground missile is to be developed by the mid-2020s," *Defense News* reported in 2019. Israeli company Elbit is assisting in the development of the radar of the KF-21.

### **KF-21 and AMCA**

The KF-21 will be powered by two F414 engines, built by US Company GE. GE delivered the first F414 engines to South Korea last year. Interestingly, the F414 will also power the initial variants of India's under-development Advanced Medium Combat Aircraft (AMCA) stealth fighter. The DRDO currently plans to fly the first prototype of the AMCA by 2025.

The AMCA will be similar to the KF-21 in being a twin-engine fighter with an approximate take-off weight of around 25 tonnes.

While similar in layout to the KF-21, the AMCA is being designed with an internal weapons bay. The DRDO has also hinted at developing an unmanned version of the AMCA. In February this year, A.K. Ghosh, the director of the AMCA project for DRDO, told *The New Indian Express*, "We have plans in future to incorporate 6th generation technologies, where it will be possible to fly AMCA aircraft in an autonomous mode for dangerous missions."

The Indian Air Force currently expects to buy up to 125 AMCA fighters. According to reports, the first two squadrons of AMCA jets would be powered by the F414 engines, while the remaining ones would be equipped with a higher-thrust engine to be developed in India with foreign assistance.

<https://www.theweek.in/news/world/2021/04/09/is-south-koreas-new-kf-21-fighter-similar-to-indias-amca-stealth-fighter.html>

## **Business Standard**

*Sun, 11 April 2021*

### **MHA to restart Delhi Cantt's Covid centre from next week as infections rise**

*"The centre will be opened immediately, within this week and soon it will start taking patients as per previous mandate," an official said*

New Delhi: As Delhi is witnessing a massive spike in COVID-19 cases, the Ministry of Home Affairs (MHA) after a meeting with top government officials has decided to re-open the COVID-19 centre situated in Cantt area, sources said on Saturday. Initially, the centre will have 500 beds which will be increased gradually.

According to the MHA sources, Union Home Secretary Ajay Kumar Bhalla on Friday held a meeting with all government top officers including Director AIIMS, officials from Defence Research and Development Organisation (DRDO) and Union Health Ministry and Chief Secretary Delhi where it was decided that government will reopen COVID-19 Centre at Delhi Cantt.

"It has been decided that the 500 bedded hospital will be re-opened in Delhi and DRDO will run the centre. The decision has been taken in wake of a massive spike in the number of cases," a senior government official said.

Sources also said that the COVID-19 centre will be opened immediately.

"The centre will be opened immediately, within this week and soon it will start taking patients as per previous mandate," an official said. "CAPF doctors and paramedics along with Defence doctors and staff will be called in to start this facility. The decision has been taken in a meeting chaired by Home Secretary Ajay Bhalla," sources said.



**A health worker takes sample from a man for COVID-19 test, as coronavirus cases surge across the country, in New**

Official communication will be released soon to intimate all stakeholders, sources claimed. It is yet to be decided if the world's largest COVID-19 centre in Chhatarpur will restart or not, sources said. Delhi reported 3,450 COVID-19 cases on Friday, taking the total number of active cases in the Union Territory to 26,631. With 39 fatalities in the last 24 hours, the death toll in Delhi has reached 11,196, the Union Health Ministry said.

According to the Ministry on Saturday, the country recorded 1,45,384 new COVID-19 cases in the last 24 hours. With 794 new COVID-related deaths in the last 24 hours, the toll in the country has mounted to 1,68,436. Currently, there are 10,46,631 active cases.

As many as 9,80,75,160 people have been vaccinated against COVID-19 in the country.

*(Only the headline and picture of this report may have been reworked by the Business Standard staff; the rest of the content is auto-generated from a syndicated feed.)*

[https://www.business-standard.com/article/current-affairs/mha-to-restart-delhi-cantt-s-covid-centre-from-next-week-as-infections-rise-121041000402\\_1.html](https://www.business-standard.com/article/current-affairs/mha-to-restart-delhi-cantt-s-covid-centre-from-next-week-as-infections-rise-121041000402_1.html)



Mon, 12 April 2021

## As cases spike, DRDO set to reopen its Covid facility at Delhi Cantt next week

*A DRDO spokesperson told The Indian Express that the first 250 beds will be ready in the next seven days*

New Delhi: With cases spiking in the capital, the Defence Research & Development Organisation (DRDO) will reopen its temporary Covid facility with 500 ICU beds at the Delhi Cantonment area by next week. A spokesperson of the organisation told The Indian Express that the first 250 beds will be ready in the next seven days.

Delhi has recorded 66,273 cases this month, with the doubling rate coming down from 16 days to six days in the last one month.

The facility was shut down on February 18 as Covid cases had come down, Major General SS Bhatia, VSM, Additional Director General Armed Forces Medical Services (DG AFMS) (E&S), told The Indian Express.

Last year on July 5, the DRDO had inaugurated the 1,000-bed Sardar Vallabhbhai Patel Covid hospital. Spread over 25,000 sq mts, it was built in 12 days on land owned by the Indian Air Force near the New Delhi Domestic Terminal 1 on Ulan Batar Marg in Delhi Cantonment Area. It had 250 ICU beds. The hospital was run by healthcare staff from DG AFMCS as well as from the Armed Forces Medical College in Pune. This time, doctors of the military and paramilitary shall be present.

The hospital was a temporary structure, with four main hangars. It had a vertical cryogenic medical oxygen tank capable of sustaining oxygen needs of 1,000 patients for four days.

<https://indianexpress.com/article/cities/delhi/as-cases-spike-drdo-set-to-reopen-its-covid-facility-at-delhi-cantt-next-week-7269481/>



The facility was closed in Feb after cases dipped. (Express archive)



**Press Information Bureau**  
**Government of India**

**Ministry of Defence**

*Fri, 09 April 2021 1:44PM*

### **Raksha Mantri Shri Rajnath Singh holds bilateral talks with Kazakh Defence Minister Lt Gen Nurlan Yermekbayev;**

#### **Discuss ways to further strengthen bilateral defence cooperation**

Raksha Mantri Shri Rajnath Singh held bilateral talks with Defence Minister of Republic of Kazakhstan Lieutenant General Nurlan Yermekbayev in New Delhi on April 09, 2021. During the meeting, the two Ministers exchanged views to further strengthen bilateral defence cooperation, including through training, defence exercises and capacity building. They agreed that both sides must look at the possibility of defence industrial collaboration of mutual interest.

The Defence Minister of Kazakhstan thanked Raksha Mantri for the opportunity given to the Kazakh troops for deployment as part of the Indian battalion in United Nations Interim Force in Lebanon (UNIFIL). Both Ministers also positively assessed the annual KAZIND Exercise.

Chief of Defence Staff General Bipin Rawat, Chief of Naval Staff Admiral Karambir Singh, Defence Secretary Dr Ajay Kumar, Secretary (Defence Production) Shri Raj Kumar and other senior civil and military officials of Ministry of Defence were also present on the occasion.

Lieutenant General Nurlan Yermekbayev is on an official visit to India from April 7-10, 2021. He visited HQs 12 Corps at Jodhpur and the Longewala sector in Jaisalmer. The Kazakh Defence Minister is in India on the invitation of Raksha Mantri.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1710618>





पत्र सूचना कार्यालय  
भारत सरकार

रक्षा मंत्रालय

*Fri, 09 April 2021 1:44PM*

## रक्षामंत्री श्री राजनाथ सिंह ने कजाकिस्तान के रक्षामंत्री लेफ्टिनेंट जनरल नुर्लान यर्मकबएव के साथ द्विपक्षीय बातचीत की द्विपक्षीय रक्षा सहयोग को और सुदृढ़ बनाने के तरीकों पर चर्चा की

रक्षामंत्री श्री राजनाथ सिंह ने 9 अप्रैल 2021 को नई दिल्ली में कजाकिस्तान के रक्षामंत्री लेफ्टिनेंट जनरल नुर्लान यर्मकबएव के साथ द्विपक्षीय बातचीत की। मुलाकात के दौरान दोनों मंत्रियों ने प्रशिक्षण, रक्षा अभ्यासों तथा क्षमता निर्माण के जरिए द्विपक्षीय रक्षा सहयोग को और सुदृढ़ बनाने के लिए विचारों का आदान-प्रदान किया। उन्होंने सहमति जताई कि दोनों पक्षों को निश्चित रूप से परस्पर हितों के रक्षा औद्योगिक सहयोग की संभावना पर विचार करना चाहिए।

कजाकिस्तान के रक्षामंत्री ने लेबनान में संयुक्त राष्ट्र अंतरिम बल (यूएनआईएफआईएल) में भारतीय बटालियन के एक हिस्से के रूप में तैनाती के लिए कजाकिस्तान की सैन्य टुकड़ी को अवसर देने के लिए रक्षामंत्री श्री राजनाथ सिंह को धन्यवाद दिया। दोनों मंत्रियों ने वार्षिक काजइंड अभ्यास का सकारात्मक रूप से आकलन भी किया।

चीफ ऑफ डिफेंस स्टाफ जनरल बिपिन रावत, नौसेना अध्यक्ष एडमिरल करमबीर सिंह, रक्षा सचिव डॉ. अजय कुमार, सचिव (रक्षा उत्पादन) श्री राज कुमार तथा रक्षा मंत्रालय के अन्य वरिष्ठ सिविल तथा सैन्य अधिकारी भी इस अवसर पर उपस्थित थे।

लेफ्टिनेंट जनरल नुर्लान यर्मकबएव 7-10 अप्रैल, 2021 से भारत की अधिकारिक यात्रा पर हैं। उन्होंने जोधपुर में 12 कॉर्प्स के मुख्यालय तथा जैसलमेर में लोंगेवाल का दौरा किया। कजाकिस्तान के रक्षामंत्री लेफ्टिनेंट जनरल नुर्लान यर्मकबएव रक्षामंत्री श्री राजनाथ सिंह के आमंत्रण पर भारत में हैं।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1710664>



**Press Information Bureau  
Government of India**

**Ministry of Defence  
Press Release**

*Sat, 10 April 2021 6:10PM*

## **11th Round of India-China Corps Commander Level Meeting**

The 11th round India-China Corps Commander Level Meeting was held at Chushul-Moldo border meeting point on 09 April 2021. The two sides had a detailed exchange of views for the resolution of the remaining issues related to disengagement along the LAC in Eastern Ladakh.

The two sides agreed on the need to resolve the outstanding issues in an expeditious manner in accordance with the existing agreements and protocols. In this context it was highlighted also that completion of disengagement in other areas would pave the way for two sides to consider de-escalation of forces and ensure full restoration of peace and tranquility and enable progress in bilateral relations.

The two sides agreed that it was important to take guidance from the consensus of their leaders, continue their communication and dialogue and work towards a mutually acceptable resolution of the remaining issues at the earliest. They also agreed to jointly maintain stability on the ground, avoid any new incidents and jointly maintain peace in the border areas.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1710880>



**पत्र सूचना कार्यालय  
भारत सरकार**

**रक्षा मंत्रालय**

*Sat, 10 April 2021 6:10PM*

## **भारत और चीन के कोर कमांडरों के बीच 11वें दौर की वार्ता**

भारत-चीन कोर कमांडर स्तरीय 11वें दौर की बैठक दिनांक 09 अप्रैल 2021 को चुशूल-मोल्दो सीमा पर बने बैठक स्थल पर आयोजित की गई थी। दोनों पक्षों के बीच पूर्वी लद्दाख में एलएसी के साथ-साथ डिसइंगेजमेंट से जुड़े बाकी मुद्दों के समाधान के लिए विचारों का विस्तृत आदान-प्रदान हुआ।

दोनों पक्ष मौजूदा समझौतों और प्रोटोकॉल के अनुसार बकाया मुद्दों को तेजी से सुलझाने की आवश्यकता पर सहमत हुए। इस संदर्भ में यह भी रेखांकित किया गया कि अन्य क्षेत्रों में डिसइंगेजमेंट करने से दोनों पक्षों के लिए सेनाओं की संख्या में कमी करने और शांति व सौहार्द की पूर्ण बहाली सुनिश्चित करने तथा द्विपक्षीय संबंधों में प्रगति को सफल बनाने का मार्ग प्रशस्त होगा।

दोनों पक्ष इस बात पर सहमत थे कि अपने नेताओं की सहमति से मार्गदर्शन लेना, अपने संवाद को जारी रखना और शेष मुद्दों के पारस्परिक रूप से स्वीकार्य समाधान की दिशा में जल्द से जल्द काम करना महत्वपूर्ण है। उन्होंने जमीन पर संयुक्त रूप से स्थिरता बनाए रखने, किसी भी नई घटना से बचने और संयुक्त रूप से सीमावर्ती क्षेत्रों में शांति बनाए रखने पर भी सहमति जताई।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1710926>

## When India's military czar laid out top national security challenges

*In a recent talk on preparing the armed forces for current and future challenges, chief of defence staff (CDS) General Bipin Rawat stressed that India cannot fight its next war premised on the experiences and structures of wars it fought in the past*

*By Rahul Singh*

India's senior-most military commander has identified building capability to defend against cyber threats, jointness among the three services to extract the full potential of India's combat power, integration of civil and military technological efforts and building a symbiotic relationship between internal and external security as some of the key focus areas to take on emerging security challenges that could threaten national interests.

In a recent talk on preparing the armed forces for current and future challenges, chief of defence staff (CDS) General Bipin Rawat stressed that India cannot fight its next war premised on the experiences and structures of wars it fought in the past, and it was critical to balance today's requirements with what the country needs to do differently to face future challenges.



CDS General Bipin Rawat. (PTI)

From proxy war to non-contact, conventional and collusive wars under a nuclear overhang, the country faces multiple threats across the full spectrum of conflict, the CDS said in a detailed talk at the event organised by Vivekananda International Foundation on April 7. He said the changed global environment demanded a change in India's outlook and policies.

While the CDS and Indian military chiefs have often intervened in the public sphere, what stood out in Rawat's remarks was the candour with which he spoke.

"Traditional strategies, which used to account for India's national security paradigm such as inter-state and intra-state conflict, no longer adequately capture the complex security linkages existing across seemingly disparate issues," Rawat said.

Appointed as India's first CDS on January 1, 2020, Rawat wears three hats — he is the permanent chairman of chiefs of staff committee (COSC), heads the department of military affairs (DMA), and is the single-point military adviser to the defence minister.

### Preparing for cyber threats

The CDS said China was way ahead of India in technology, and it was capable of launching cyber attacks and disrupting a large number of Indian systems. Rawat said the biggest gap between the two countries was in the cyber domain and India was looking at collaborating with western nations to overcome deficiencies in the critical area.

He said cyber agencies in the military were working to ensure that "the downtime and the effect of a cyber attack" did not last long. "We should be able to overcome cyber attacks and continue with our systems either through an alternative or preventive means through firewalls," he said.

Experts said the cyber threat that India faces from China is not exaggerated and demands urgent attention.

Chinese cyber capabilities are well known and the recent intrusions in the power sector by Chinese hackers are a pointer to how India's critical infrastructure is under threat, said former Northern Army commander Lieutenant General DS Hooda (retd).

A few weeks ago, Recorded Future, a US-based security consultancy, reported that Chinese groups had intruded into the networks of at least a dozen Indian state-run organisations since mid-2020 in an attempt to insert malware that could cause widespread disruptions. To be sure, India denied any data breach in the attempts made by Chinese hackers to target the country's power grid.

“Our normal response has been to downplay this (cyber) threat and I am glad the CDS has given a realistic picture. This should trigger the crafting of a comprehensive strategy to deal with this danger,” Hooda said. He added that technology support from western nations is welcome to overcome deficiencies in the short term, but ultimately there is no option but to develop indigenous IT systems for use in the critical infrastructure. “Reliance on foreign hardware and software is a serious vulnerability. Indigenisation must be given the highest priority,” Hooda pointed out.

The CDS described the cyber threat as alongside biological risks and economic disruptions as major challenges.

“Recent events show that many of the biggest threats we face today respect no borders and must be met with collective action, e.g. the Covid-19 pandemic, biological risks, escalating climate crisis, cyber and digital threats, international economic disruptions, protracted humanitarian crises, violent extremism and terrorism, proliferation of weapons of mass destruction,” Rawat said.

Cyber has, perhaps, come to acquire a pivotal position in any nation's security architecture, said Air Vice Marshal Manmohan Bahadur (retd), additional director general, Centre for Air Power Studies.

“While preparing to acquire offensive capability, it is critical that one's own systems are protected. While we may be lagging behind China, our nation does not lack cerebral capital to catch up. All efforts must be made to tap the nation's inherent cyber know-how to protect our vital infrastructure from cyber intrusions,” Bahadur said.

### **Jointness and challenges**

Jointness, integration and modernisation in line with the changing security environment as well as utmost optimisation of resources is critical, the CDS said. The government expects Rawat to bring about jointness among the three services in a three-year time frame (by January 2023). One of the means to achieve jointness is the setting up of integrated theatre commands for the best use of military resources to fight future battles.

“The current CDS system in India is evolutionary and will progressively adopt more means of integration and joint functioning for an integrated system to emerge finally,” Rawat said.

Nobody expects the road to theaterisation to be smooth and the ongoing efforts to bring about jointness among the three services are expected to face resistance. Rawat said India as a nation believed in status quo and there was always a hesitation to change.

“There is a feeling amongst the three services that army being a very large service — compared to navy and Indian Air Force — will possibly usurp the two entities and everything will become army-centric. I think this is a misnomer because the army, navy and IAF have their own specialties. They will retain their autonomy and integration will only ensure that we have systems that at least operate together,” Rawat said.

India is set to begin a formal roll-out of its long-awaited theaterisation plan to best utilise its military's resources amid growing security threats, with the Air Defence Command and the Maritime Theatre Command set to be launched by May. India will also have three other integrated commands to secure its western, northern and eastern fronts — these are likely to be rolled out by December 2022.

In addition, a logistics command is in the works to avoid duplication of efforts and resources. The CDS's mandate includes bringing about jointness in operations, logistics, transport, training, support services and repairs and maintenance of the three services.

Theaterisation is imperative to meet and mitigate future security challenges which as the CDS defined are multi domain and multidimensional, said Lieutenant General Vinod Bhatia (retd), a former director general of military operations. The operational control of all the theatre commands

will eventually come under the CDS, with the service chiefs being responsible for raising, training and sustaining their forces.

“The CDS has defined an effective way forward, including transition management, wherein till theaterisation is achieved the responsibility of operational readiness will be with the service chiefs and that of defence preparedness with the CDS and COSC. But once theaterisation is achieved, there needs to be a role reversal with the CDS being responsible for operational preparedness and service chiefs for defence preparedness,” Bhatia said.

He said apprehensions about theaterisation among the services were natural as there will always be a resistance to change. “The challenge will be to manage the mindsets and the transition. This can best be achieved by a transparent road map taking all stake holders on board,” Bhatia said.

Greater emphasis would now be on advancing jointness and integration across the board so as to develop trust among the rank and file and shape the congruent perception to operate efficiently and effectively, the CDS said.

### **Integrating civil and military efforts**

The CDS highlighted the need to integrate civil and military technological efforts for achieving self-reliance and strengthening the country’s security.

He said cooperation between government and commercial facilities in research and development (R&D), manufacturing, maintenance operations, combined production of similar components and sub components on same production lines would optimise commercial and defence industrial base to maximise resource utilisation and reduce manufacturing and life cycle costs for military equipment. Rawat said synergising military and civil efforts was crucial in the backdrop of shrinking budgets.

“The contracting envelope of the defence budget makes it imperative to create dual use infrastructure through civil military fusion. We must examine the feasibility of integrating civil-military airports to strengthen aviation safety, airspace management and combat support capabilities. Satellites for remote sensing and reconnaissance, communications, positioning and navigation must also meet requirements of the armed forces with desired in-built encryptions,” the CDS said.

He said railway wagons and civil truck trailers must be manufactured for dual use — capable of transporting heavy military equipment including armoured fighting vehicles. The CDS added that construction of communication towers and electricity infrastructure along with rail, roads, bridges and tunnels in border states must be of specifications that facilitate utilisation by the military as well.

“Civil-military integration in infrastructure development holds the key to Whole-of-Nation approach towards national security,” Rawat said.

Experts said synergising military and civil efforts was vital for national security.

India is already lagging behind in civil-military fusion which other countries, especially China, have already embarked on.

“The strengths of civil R&D institutions, manufacturing infrastructure and knowledge bank need to be dovetailed with defence capability needs so as to leapfrog with respect to time and technology standards. To achieve this, a top-down approach would be required through formulation of national level directives and policies,” Manmohan Bahadur said.

### **Internal and external security**

Rawat said in today’s complex world, security has a much broader construct that cover geopolitical interests, internal stability and economic and social security.

“It envisages a symbiotic relationship between internal and external security, reinforcing the premise that a country’s external security posture is organically linked to its internal strength,” the CDS said.

He said while external challenges could be met by effective diplomacy and adequate defence capability, internal stability required strong political institutions, economic growth, social harmony, efficient law and order machinery, expeditious judicial relief and good governance.

“National security stands redefined, deepening from state to individual security and broadening from military threats to issues like economy, environment etc. The coronavirus pandemic has brought to fore the importance of public health in the national security equation,” the CDS said.

“In an environment of ambiguity, uncertainty and frequent opacity, the political leadership needs to be provided with comprehensive, complete and evaluated options on matters of national security in the form of a ‘single point advice’, requiring multiple inputs from political, military, diplomatic and intelligence agencies,” Rawat added.

The CDS has made a comprehensive pointer at imperatives to deal with threats in the internal and external dimensions, said former army vice chief Lieutenant General AS Lamba (retd).

“Recent adaptations of threats such as terrorism, increasing cyber-attacks backed by adversary-led networks, support to insurgency movements, immigration flows etc can be best addressed by the contours of direction by the CDS,” Lamba pointed out.

<https://www.hindustantimes.com/india-news/when-india-s-military-czar-laid-out-top-national-security-challenges-101617959815348.html>



Sat, 10 April 2021

## **Training at College of Defence Management will enable officers to bridge execution gaps: Air Chief Marshal**

*Acumen reinforced by quantitative rationale acquired in the Higher Defence Management Course (HDMC) at College of Defence Management (CDM) will enable officers to bridge execution gaps in assignments, said Air Chief Marshal, Indian Air Force RKS Bhadauria on Friday*

Secunderabad: Acumen reinforced by quantitative rationale acquired in the Higher Defence Management Course (HDMC) at College of Defence Management (CDM) will enable officers to bridge execution gaps in assignments, said Air Chief Marshal, Indian Air Force RKS Bhadauria on Friday. "The course will also facilitate lateral and divergent thinking to avoid straight-jacketed thought," Bhadauria added while giving the Valedictory Address at the CDS in Secunderabad, Telangana.

As per a statement, 159 tri-services officers including officers from friendly foreign countries successfully completed the HDM course at the CDS. The Air Chief Marshal presided over the Valedictory Function and felicitated the graduating officers. These officers will soon be taking up challenging command and staff assignments in Armed Forces of their respective countries.

International participants included 12 officers from Afghanistan, Bangladesh, Bhutan, Kenya, Maldives, Saudi Arabia, Sri Lanka and Thailand. The HDMC is a flagship program of the CDM and is pitched at the directional and conceptual level with a focus on the application of management tools and techniques at the operational and strategic level.

The international and tri-services flavour to the course allows varied and unique learning experience for the participant officers. (ANI)



Air Chief Marshal, Indian Air Force RKS Bhaduria (centre) at the Valedictory function at the College of Defence Management. . Image Credit: ANI

*(This story has not been edited by Devdiscourse staff and is auto-generated from a syndicated feed.)*

<https://www.devdiscourse.com/article/law-order/1528717-training-at-college-of-defence-management-will-enable-officers-to-bridge-execution-gaps-air-chief-marshal>

## Army Chief holds defence talks with Bangladesh's Navy, Air Force Chiefs

*He also planted a tree in Ramu Cantonment in Cox's Bazar to commemorate the everlasting friendship between the two Armies*

*By Anisur Rahman*

Dhaka: Indian Army Chief General M M Naravane on Thursday met Bangladesh's Air Force and Navy chiefs, and discussed issues of mutual interest and matters on bilateral defence cooperation. Naravane also paid tributes to the fallen heroes of Bangladesh's 1971 Liberation War after arriving in the country on a five-day visit to further strengthen the close and fraternal ties existing between the Armed Forces of the two nations. The visit of Naravane, who is here at the invitation of his Bangladeshi counterpart Gen Aziz Ahmed, comes less than two weeks after Prime Minister Narendra Modi travelled to the neighbouring country.

The Indian Army's Additional Directorate General of Public Information (ADG PI) said on Twitter that General Naravane called on Admiral M Shaheen Iqbal, Chief of Naval Staff, Bangladesh Navy and discussed issues of mutual interest. After his interaction with Admiral Iqbal, the Indian Army chief met the country's acting Chief of Air Staff of Bangladesh Air Force. "General MM Naravane COAS interacted with Air Vice Marshal M Abul Bashar, Acting Chief of Air Staff of Bangladesh Air Force and discussed matters on bilateral defence cooperation," the



Army chief General M M Naravane (2nd R) with Air Vice Marshal

ADG PI said in another tweet. Soon after his arrival here, Gen Naravane paid tribute to the fallen heroes of the 1971 Liberation War by laying a wreath at the altar of Shikha Anirban in Dhaka Cantonment.

"Gen Naravane on 1st day of his 5-day visit to #Bangladesh paid tributes to the martyrs of the Liberation War at the #ShikhaAnirban today," the ADG PI said. He was welcomed with a guard of honour at Senakunj. He will also be visiting various military stations in Bangladesh. The Indian Army chief will share his experience during the seminar on United Nations Peace Support Operations. He will also witness the culmination exercise, hardware display and closing ceremony of the joint military exercise 'Shantir Ogroshena', a multilateral UN-mandated counter-terrorism exercise from April 4 to 12. Besides armies of Bangladesh and India, the exercise is being participated by Bhutan and Sri Lanka along with observers from the US, the UK, Turkey and Saudi Arabia.

The visit of the Indian Army chief will further strengthen the close and fraternal ties existing between the Armed Forces of the two countries, the Indian High Commission here said. The year 2021 marks the 50th anniversary of diplomatic relations between India and Bangladesh, the liberation of Bangladesh and the birth centenary of 'Bangabandhu' Sheikh Mujibur Rahman. In reflection of close ties, India is also hosting a number of events to mark the 50th anniversary of the 1971 war that led to the liberation of Bangladesh. Around 93,000 Pakistani troops had surrendered



before the joint forces of the Indian Army and the “Mukti Bahini” on December 16, 1971 that paved the way for the birth of Bangladesh. The Army chief is also scheduled to visit the Mujibur Rahman memorial museum in Dhanmondi where he will pay tributes to the founding father of that country.

<https://www.thehitavada.com/Encyc/2021/4/9/Army-chief-holds-defence-talks-with-Bangladesh-s-Navy-Air-Force-chiefs.html>

**mint**

Mon, 12 April 2021

## Indian Army chief Gen Naravane calls for enhancing budget for UN peacekeepers

- *The Indian Army chief also called for providing appropriate logistics and improved technological support for the UN blue helmet missions, pointing out their emerging challenges*
- *He said the UN peacekeeping missions should run on a participatory basis*

Indian Army chief Gen MM Naravane on Sunday urged the United Nations to enhance the budget for its peacekeeping missions and emphasised the need to provide appropriate logistics and improved technological support for the blue helmet missions in view of the emerging challenges.

Gen Naravane, who is here on a five-day official tour, delivered a keynote address on “Changing Nature of Global Conflicts: Role of UN Peacekeepers” during the “Army Chiefs Conclave” hosted by his Bangladeshi counterpart General Aziz Ahmed, the Indian Army’s Additional Directorate General of Public Information (ADG PI) tweeted.

Gen Naravane laid emphasis on enhanced budget for UN peacekeeping activities, Bangladesh defence ministry’s Inter Service Public Relations (ISPR) directorate quoted him as saying at the conclave.

Bangladesh Foreign Minister A K Abdul Momen was the chief guest at the event.

The Indian Army chief also called for providing appropriate logistics and improved technological support for the UN blue helmet missions, pointing out their emerging challenges. He said the UN peacekeeping missions should run on a participatory basis.

The Bangladesh Army hosted the conclave coinciding with the celebrations of the birth centenary of the country’s ‘Father of the Nation’ Bangabandhu Sheikh Mujibur Rahman and the golden jubilee of its 1971 independence.

Force commander of UN multidimensional integrated stabilisation mission in Mali Lieutenant General Dennis Gyllensporree, force commander of UN multidimensional integrated stabilisation mission in the Central African region Lieutenant General Sidki Daniel Traore and Bhutan army’s deputy chief of operation Brigadier General Darji Rinchen, among others attended the conclave.

Senior diplomats, security strategists and police officers also attended the seminar.

During the event, the Indian Army chief interacted with the senior officers of the participating nations and military observers from the other nations.

Momen told the conclave that the nature of peacekeeping operations in recent periods transformed both in terms of scale and scope for what “peacekeeping missions today are more than truce supervising operation”.



Indian Army chief Gen Naravane calls for enhancing budget for UN peacekeepers

The changing situation further expanded the missions' responsibility taking into account "other dimensions of peace, such as establishing rule of law, protection of human rights, protection of women and children, support to political process, managing elections, reintegration and socio-economic development," he said.

The conclave was held as part of a multilateral UN-mandated counter-terrorism exercise, Shantir Ogroshena (Frontrunners of Peace) that commenced on April 4. An Indian Army contingent of 30 personnel are participating along with the Royal Bhutan Army, Sri Lankan Army and Bangladesh Army in the exercise that will conclude on Monday.

Military observers from the US, UK, Turkey, Saudi Arabia, Kuwait and Singapore are also attending the exercise. The aim of the exercise is to strengthen the procedures and enhance interoperability amongst neighbourhood countries to ensure robust peacekeeping operations in the region. The armies of all the participating nations shared their valuable experiences and refined their drills and procedures in peacekeeping operations.

The visit of Gen Naravane, who is here at the invitation of his Bangladeshi counterpart Gen Aziz Ahmed, comes less than two weeks after Prime Minister Narendra Modi travelled to the neighbouring country and met the top leadership here to strengthen the strategic ties.

The year 2021 marks the 50th anniversary of diplomatic relations between India and Bangladesh, the liberation of Bangladesh from Pakistan and the birth centenary of 'Bangabandhu' Mujibur Rahman.

<https://www.livemint.com/news/india/indian-army-chief-gen-naravane-calls-for-enhancing-budget-for-un-peacekeepers-11618153912567.html>



Sun, 11 April 2021

## IAF to adopt new process to lease refuelling aircraft

*It will be based on hours of availability*

*By Dinakar Peri*

New Delhi: The Indian Air Force (IAF), which is looking to lease mid-air refuelling aircraft, will adopt a new methodology for the process based on the number of hours of availability per year as criteria, a senior defence official said.

"The leasing will be based on hours of availability per year indicating the minimum and maximum hours required," the official said. "We will use the leased tankers for training purposes and keep the existing IL-78s in service for operational purposes," the official stated.

On the number of refuellers that would be leased, the official said it would be decided based on the responses the IAF receives.

The IAF presently has six Russian IL-78 tankers and is looking at leasing a few tanker aircraft to meet immediate requirements as the deal for procuring six new tankers has repeatedly failed to fructify.

The IAF is also looking to lease Basic Trainer Aircraft (BTA) to fill the immediate shortage for training rookie pilots. With the follow-on contract for Pilatus trainers now scrapped, the leased aircraft would plug the gaps in training till the indigenous HTT-40 being developed by Hindustan



An IAF IL-78 MKI tanker aircraft practises mid-air refuelling. File | Photo Credit: AFP

Aeronautics Limited (HAL) is inducted. A Request for Information was recently issued for leasing of BTA.

The IAF has 75 PC-7 MK-II BTA procured from Pilatus Aircraft Ltd under a ₹4,000 crore deal in 2012 for which deliveries were completed by 2015-end. However, following allegations of corruption, the follow-on deal for additional aircraft was scrapped.

With Kiran trainers being obsolete and indigenous HTT-40 in advanced trials, the IAF is looking to plug the gap through leasing of trainers. About 20 aircraft could be leased for four-five years, officials had stated earlier.

In August 2020, the Defence Acquisition Council (DAC) approved the procurement of 106 HTT-40 for the IAF of which Post certification 70 BTA will be initially procured from HAL and balance 36 after operationalisation of HTT-40 fleet in IAF. The leased trainers will meet the shortfall till term especially as the IAF is looking to increase the intake of pilots too, the official added.

The Navy too is considering leasing several platforms like utility helicopters, used minesweepers, tankers among others. The Army is looking to lease four Heron Unmanned Aerial Vehicles (UAV) from Israel which is in advanced stages of conclusion.

The option for leasing of military equipment was introduced in the Defence Acquisition Procedure 2020. The three services have since listed several platforms for leasing to cater for immediate shortages.

<https://www.thehindu.com/news/national/iaf-to-adopt-new-process-to-lease-refuelling-aircraft/article34292349.ece>



*Sun, 11 April 2021*

## **How powerful is the thunder of Indian Army – The K-9 ‘Vajra’ that was also deployed in Iraq & Syria?**

*By Ayush Jain*

India may have deployed its K9 ‘Vajra’ self-propelled howitzers during the Ladakh standoff with China last year, but critics say the weapon could be vulnerable to anti-tank guided missiles (ATGMs).

India is among seven nations that use the Korean-origin K-9 howitzer at present. The Indian military also conducted high-altitude trials of the weapon system.

The Indian K-9 VAJRA-T is the domestic version of the South Korean self-propelled 155mm/52cal Howitzer (SPH) ‘K-9 Thunder’ designed and developed by the Agency for Defense Development and Samsung Aerospace Industries. The weapon system is now manufactured by Hanwha Defense.

Besides India, K-9 is used by six other nations — Turkey, Australia, Estonia, Norway, Finland, and Egypt.

### **What is a Self-Propelled Howitzer?**

A self-propelled howitzer is a howitzer on wheels. It is equipped with its own propulsion system to move towards its firing position and used for long-range indirect bombardment support on the battlefield. An SPH has around the same range as its non-wheeled counterparts.

Modern self-propelled artillery vehicles may superficially resemble tanks (much like the K-9 does), but they are generally light-armored. However, they protect their crews against shrapnel and

small arms and are therefore usually included as armored fighting vehicles. Many are equipped with machine guns for defense against enemy infantry.

However, K-9's crew is protected by an all-welded steel armor construction which is rated to withstand 14.5 mm armor-piercing rounds, 152 mm shell fragments, and anti-personnel mines, and overall nuclear, biological, and chemical protection.

The K9 has the ability to fire its shells in MRSI mode (Multiple Rounds Simultaneous Impact). In the MRSI mode, the K9 is able to fire three shells in under 15 seconds — 1 shell every 5 seconds — each in different trajectories so that all of the shells land at their target at the same time.

This is particularly effective in surprise bombardment tactics, especially against enemy fortifications and strongholds in the open.

It is also supplemented with an ammunition resupply vehicle, called the K-10. Built on the K9 platform, it shares the same chassis as K9, preserving K9's mobility, and can follow the main artillery battery without lagging behind.

#### India's K9 Vajra

It has a maximum transfer rate of shells of 12 rounds per minute, and a maximum load of shells is 104 rounds. The reloading process is fully automated and is done through a munition bridge on the K10 that extends out to lock itself into a reception hole located at the rear of the K9.

This allows the unit to rearm itself under harsh combat conditions without the crew having to expose themselves to the combat environment.

#### The Flipside

While the gun can be deployed for firing in just one minute, it isn't stable enough to be fired on the move. The system was extensively used by Turkish forces in Syria, in cross-border invasion targeting Kurdish militias.

Turkey operates its T-155 Firtina, a locally produced version of the South Korean K-9. The Firtinas are long-barreled 155 mm howitzers with a range of 30 to 40 kilometers depending on the ammunition.

The Firtinas were first deployed against PKK forces in Iraq in 2008. Later, they were used in the conflict in Syria.

On April 30, 2016, the Islamic State released a video depicting AT-13 Metis-M anti-tank guided missiles knocking out three Firtinas.

“Like most self-propelled artillery, the Firtina's armor is for stopping shrapnel and small arms, *not* guided missiles — leaving one to wonder why the vehicles were in such an exposed position in the first place,” Sebastien Roblin wrote in a piece for War Is Boring.

Nevertheless, the K9 has seen harsh combat environments in the Middle East and the cold climate of Korea. It was made to operate in the rugged environment of the Demilitarized Zone with North Korea.

This system has been well received by the Indian Army, as part of its long-staggered artillery modernization process and increases its firepower multiple times with the gunners.

<https://eurasianimes.com/indias-k-9-vajra-howitzer-could-be-vulnerable-to-chinese-guided-missiles/>

## Indian Army strengthens mountain strike corps looking after China border

### Synopsis

**An existing Division formation, with around 10,000 troops, located in the Eastern sector has now been assigned to the 17 Mountain Strike Corps headquartered in West Bengal's Panagarh, government sources told ANI.**

Further strengthening its deployments along the Northern borders, the Indian Army is adding around 10,000 more troops to its only mountain strike corps responsible for looking after offensive operations along the China border.

The strengthening of the Mountain Strike Corps is part of the steps taken by the force to rebalance its focus more towards the Chinese border from the western front with Pakistan.

An existing Division formation, with around 10,000 troops, located in the Eastern sector has now been assigned to the 17 Mountain Strike Corps headquartered in West Bengal's Panagarh, government sources told ANI.

"The Mountain Strike Corps was cleared by the Centre about a decade ago but it had only one Division attached to it and with the latest step, it will now have more firepower and manpower at its disposal to carry out its assigned task," they said.

The Army has also done a lot of rebalancing in the recent past and a number of formations have been given dual tasks and asked to focus more towards the China border which erupted last year due to the Chinese aggression in eastern Ladakh and other areas.

Meanwhile, the Indian Army and other security forces have also started returning to the summer deployments in the Ladakh sector and other mountainous areas along the Line of Actual Control (LAC).

Both Indian and Chinese Armies have a large number of troops deployed at the border since last year. The formations of Mathura-based One Strike Corps have also been reoriented towards the Northern borders while one of its Armoured formations would continue to be with it.

The deployment of formations and troops in the Sugar sector, Central sector and the north eastern borders have also been strengthened.

Due to the Indian tactical operations along the southern bank of Pangong Tso, the Indian Army managed to secure disengagement from the Finger area, the two sides are continuing to hold talks for further disengagement and de-escalation from other friction points in the area.

India is demanding disengagement at the Gogra, Hot Springs and Depsang plains area by the Chinese Army for which the 11th round of corps commander talks are being held today.

<https://economictimes.indiatimes.com/news/defence/indian-army-strengthens-mountain-strikes-corps-looking-after-china-border/articleshow/81986138.cms>



A Border Security Force soldier wearing a mask guards a highway as Indian army convoy makes way towards Leh, bordering China, on June 19, 2020 (Representative image)

# Why is the US Navy in India's backyard? | India Today Insight

*The US Seventh Fleet issued an unusually worded release of a FONOPS drill it conducted off the Lakshadweep Islands on April 7*

*By Sandeep Unnithan*

Delhi: The US Navy's Seventh Fleet conducted what it calls a Freedom of Navigation Operations (FONOPs) drill through India's Exclusive Economic Zone (EEZ) on April 7. A strong and unusually worded release from the US Seventh Fleet headquartered in Yokosuka, Japan, said that the destroyer USS *John Paul Jones* asserted 'navigational rights and freedoms approximately 130 nautical miles west of the Lakshadweep Islands, inside India's EEZ or continental shelf' without requiring India's prior consent, consistent with international law. (The EEZ is a 200 nautical mile belt of oceanic territory around a coastal state.)

India's demand for prior consent for military exercises or manoeuvres in its EEZ was a claim inconsistent with international law, the release said. The ministry of external affairs (MEA) response on April 9, two days after the US statement, said it had 'conveyed its concerns regarding this passage through our EEZ to the government of the USA through diplomatic channels'. The MEA said that the government of India's stated position on the UNCLOS (United Nations Convention for the Law of the Sea) is that 'the Convention does not authorise other States to carry out in the Exclusive Economic Zone and on the continental shelf military exercises or manoeuvres, in particular those involving explosives, without the consent of the coastal state. The warship was 'continuously monitored transiting from the Persian Gulf towards the Malacca Straits'.



The US has used FONOPs over the past four decades as a way of asserting its right to sail through the EEZ of several coastal countries. It is the explicitly worded statement issued by the Seventh Fleet that has caused dismay in New Delhi. “To issue a press release is a change in approach and obviously a deliberate move,” says Lt General D.S. Hooda, former Northern Army Commander. It is this change that India will likely have to figure out in the days ahead. Could it be, for instance, a way of telling the Chinese that FONOPs are not China-specific but a principle that the US follows across the world, even with strategic partners.

While attention has been focused on the FONOPs that the US has used to challenge China’s expansive territorial claims in the South China Sea, what has gone unnoticed is a deliberate US policy to simultaneously conduct operational assertions through the EEZ of even close allies like Australia, Japan and South Korea. A study of the annual statements between 1992 and 2021 placed before the US Senate by the Department of Defense reveals only 10 occasions over the last 30 years that the US has not conducted ‘operational assertions’ through India’s EEZ. In the last such drill, in 2019, India was among 21 other countries, including Taiwan, through whose territorial waters the US sailed its warships.

The US Department of Defense identifies “excessive maritime claims” by coastal countries to unlawfully restrict the freedom of navigation and overflight and other lawful uses of the sea as reasons for its FONOP drills. UNCLOS, which came into effect in 1994, recognises the rights of coastal nations to exploit the resources of a 200 nautical mile belt of coastline outside their territorial waters. The US is yet to ratify it as 168 other countries have, because of Section XI of UNCLOS which governs the mining of deep seabed resources. In 2010, India had petitioned the UNCLOS, asking for its EEZ to be extended from 200 nautical miles to 350 nautical miles, which would greatly increase the area for the exploitation of natural resources. This proposal has yet to be accepted.

Interestingly, the USS *John Paul Jones*, which left the Persian Gulf, also carried out a FONOP drill through the territorial waters of the Maldives. The US issued a similar statement on the FONOPs through the Maldivian EEZ. The US and the Maldives signed their first framework agreement last September. The agreement was signed by the deputy assistant secretary of defense for South Asia. Earlier, in 2012, the US had proposed a Status of Forces Agreement, or SOFA, with the Maldives. The SOFA was a precursor to the US stationing its forces on Maldivian soil. New Delhi was then not in favour of the agreement and it died a quiet death but is believed to now favour closer ties between the US and Maldives to checkmate China’s growing presence in the Indian Ocean region.

“The irony is that the Chinese, who are signatories to UNCLOS, violate it all the time and the Americans, who have signed it but never ratified it, expect everyone else to stick to it,” says Rear Admiral Sudarshan Shrikhande, former ACNS Foreign Cooperation and Naval Intelligence.

<https://www.indiatoday.in/india-today-insight/story/why-is-the-us-navy-in-india-s-backyard-1789264-2021-04-09>

# The Chinese cyber threat is real — and India's best defence right now is to keep its outage time limited

By Prabhjote Gill

- *India's senior most armed forces official, Chief of Defence Staff (CDS) Bipin Rawat believes that China is capable of launching cyber attacks that 'large amount' of India's systems.*
- *He also revealed that India's best defence right now is to keep outage time limited when a breach does occur.*
- *This comes at a time when the threats from China are increasing in aftermath of the clash between the two Asian giants on the Line of Actual Control (LAC).*

Wars in today's day and age aren't found on the battlefield but in cyberspace. Malware is ammunition, hackers and cybersecurity experts are the soldiers, and what they're fighting over is data.

While things may have cooled down between India and China on the ground, the cyber threat posed by the Dragon is still very much in play. "China is capable of launching cyber attacks on us that can disrupt a large amount of our systems," General Bipin Rawat, India's highest ranking armed forces official, told reporters on April 7.

Harvard University's National Cyber Power Index currently ranks China second in cyber power. Meanwhile, India is among one of the most cyber targeted countries in the world. And for China, India is the number one target.



## Chinese hackers have India's power sector in its sights

Not only does India not have any offensive capabilities on hand, its defences are not foolproof. "While we're trying to create firewalls against cyber attacks, we're quite sure that they [Chinese hackers] will break through these firewalls," Rawat said.

That doesn't bode well for India's power sector, which is currently in the sights of Chinese state-sponsored hackers, according to a US-based cybersecurity firm, Recorded Future.

The most recent example of the extent of disruption an attack on the power grid can cause was witnessed in October, last year. India's financial capital was left reeling for hours as a power outage disrupted services in Mumbai. The chaos was allegedly caused by a new coalition of Chinese hackers dubbed 'Red Echo' by Recorded Future, a cybersecurity firm based out of the US.

The company believes that these Chinese state-sponsored hackers have at least one connection that is still open. The link is most likely in the network system of an Indian maritime port, although Recorded Future did not specify which one.

## India needs to integrate resources across the armed forces to face cyber threats posed by China

According to Rawat, a plan is already in the works to address China's growing prowess in the field of technology. For it to be successful, he opines that resources across all three pillars of the armed forces — the army, navy, and airforce — need to be integrated.

"What we are trying to do is create a system in which we ensure cyber defence. And we have been able to create a cyber agency, which is our own agency within the armed forces... Each



service also has its own cyber agency to ensure that even if we come under a cyber attack, the down time and the effect of the cyber attack does not last long,” Rawat explained.

However, compared to China’s cyber capabilities, India still has a lot of catching up to do. China has been preparing itself for the fifth dimension of war for over two decades, and, according to Rawat, India is still in the midst of figuring out what it needs to do.

### **China has a long history of meddling with Indian servers**

In 2008, Indian government officials told the Times of India that Chinese hackers were trying to break down servers on a daily basis — this included targets like the National Informatics Centre, the National Security Council and the Ministry of External Affairs.

Even then, the real gap between the capabilities of the two Asian giants was that India did not have any offensive system in place.

More recently, since the Galwan Valley clash — which escalated into a long, drawn out stand-off between the two Asian giants along the Line of Actual Control (LAC) — the number of threats coming in from China has only increased. According to Singapore-based cybersecurity firm, Cyfirma, there was a 200% increase in cyber attacks from China between May to June.

Even though the countries are currently in the process of disengaging and repairing their bilateral ties on the ground, disputes continue to brew in the airwaves.

<https://www.businessinsider.in/defense/news/the-chinese-cyber-threat-is-real-and-indias-best-defence-right-now-is-to-keep-its-outage-time-limited/articleshow/81981886.cms>



Sun, 11 April 2021

## **China deploys fast-attack missile catamarans in SCS**

*The appearance of Chinese cruise missile craft in the South China Sea adds a significant player to the region*

*By Dave Makichuk*

They’re fast, around 36 or 38 knots, and also well-armed.

Each boat boasts eight launchers for YJ-83 subsonic anti-ship missiles and a fast-firing 30mm H/PJ-13 Gatling gun on the bow to engage aerial targets and provide fire support.

Short-range air defense is apparently entrusted to man-portable air defense systems operated by the crew.

These prolific “chase” vessels — China has reportedly built at least 80 Type 022 fast-attack catamarans — were chiefly chiefly considered a coastal defense asset, up until now.

It seems they are nowing being in a more expeditionary role, which could have major strategic implications for the South China Sea.

According to a report by Thomas Newdick at The War Zone, a Type 022 (NATO Houbai class) vessel has reportedly been involved in an incident with a boat chartered by a Philippine media company in the hotly contested waters of the South China Sea.



**The Type 22 (NATO designation: Houbai class) cruise missile boat is a ship class in the Chinese People's Liberation Army Navy. Credit: Handout.**

Citing ABS-CBN reporter Chiara Zambrano, the craft appeared in the Second Thomas Shoal, a submerged reef located in the disputed Spratly Islands.

The missile craft then apparently aggressively chased away the boat operated on behalf of the ABS-CBN news crew, which had been sailing in the area to monitor the movements of other Chinese vessels.

“We were on our way to Ayungin Shoal [the Philippine name for Second Thomas Shoal] when a white Chinese Coast Guard ship headed toward us,” Zambrano said.

“It moved closer and closer, and we could see that through our lens. After that, it sent a radio communication and in English asked who we were and what we were doing in the area.”

The news team boat then apparently decided to head back to Palawan, at which point the fast-attack missile craft gave chase.

“Two smaller but faster ships chased us,” Zambrano recounted. “The ships were Type 022 *Houbei* fast attack craft with two missiles mounted.”

The incident comes after a succession of reported incidents of intimidation of Filipino fishermen by Chinese boats, as well as alleged illegal fishing by Chinese vessels in these waters, War Zone reported.

In March, the Philippine Coast Guard said it had identified no fewer than 220 Chinese ships at another nearby reef, in waters also under Philippine jurisdiction.

It is not clear where these fast-attack missile craft operated by the People’s Liberation Army Navy (PLAN) fast-attack are operating from and whether any examples are now permanently or semi-permanently deployed at outposts in the South China Sea.

The boats only have a range of around 300 miles, but that can be extended with a supply ship, War Zone reported.

Last November, “multiple” Type 022s took part in Chinese maritime maneuvers in the South China Sea, together with three Type 071 amphibious assault ships.

This was part of what the Global Times described as “a real combat scenario drill, with the catamarans training in comprehensive attack and defense, air defense and anti-terrorism.”

As well as maritime activity in this area, the importance of the Spratly Islands to Beijing’s wider ambitions in the South China Sea has also been reflected in the construction of artificial outposts here, War Zone reported.

Three locations, in particular, Fiery Cross Reef, Mischief Reef, and Subi Reef have all been subject to significant artificial expansion by China since 2014.

They are defended by HQ-9B surface-to-air missiles and ground-launched YJ-12B anti-ship missiles, and all three are also equipped with long runways, at least some of which are capable of supporting bombers, War Zone reported.

The Spratly Islands have also been a regular host to long-range air patrols by Chinese fighters, including Su-30 Flankers.

However, having forward-deployed flotillas of Type 022s would provide an additional immediate layer of defense, as well as a way to strike outward against enemy naval forces from those bases.

<https://asiatimes.com/2021/04/china-deploys-fast-attack-catamarans/>



China’s Type 022 missile boat incorporates stealth features and are based on Australian-designed wave-piercing catamaran hulls that are more stable than other fast missile craft in high sea conditions. Credit: Handout.



Approximately 83 Type 022 missile boats are currently in service with three flotillas, having been produced over a span of just seven years. Credit: Handout.



Sun, 11 April 2021

## Chinese Navy conducts firing test of new YJ-9 anti-ship missile from Z-9D naval helicopter

According to video footage published by the Chinese TV channel CCTV, the Chinese Navy has conducted firing tests with new low-altitude anti-ship missile YJ-9 launched from a Z-9D naval carrier-based naval helicopter.

According to the China-Arms website, the Z-9D is a naval version of the standard Z-9 Chinese-made military utility helicopter manufactured by Harbin Aircraft Manufacturing Corporation. The first prototype of the Z-9D was unveiled in 2011. In November 2016, an operational Z-9D assigned to the 5th Air Regiment, 2nd Naval Aviation Division was spotted for the first time armed with YJ-9 anti-ship missiles.

Citing Chinese military sources, the Z9-D can carry a total of four missiles fitted on stub wings mounted on each side of the helicopter. The helicopter is fitted with an improved X-band KLC-3B airborne search radar with a new flat-plate slit antenna that can search up to 180 kilometers for warship targets with a displacement of 3,000 tons or more and can capture small missile boats and speedboats of 50 tons from more than 60 kilometers away.

The YJ-9 is a lightweight anti-ship missile (AShM) that can be used against fast attack boats and gunboats. It has a range of 15 km and can fly at a speed of 0.8 Mach weighing 105 kg.

The YJ-9 missile is available in three variants depending on the guidance including the YJ-9E (radar), YJ-9EA (TV), and YJ-9EB (semi-active laser). The latest version of the YJ-9 missile has been upgraded with a new datalink antenna.

According to the SIPRI (Stockholm International Peace Research Institute) Arms Trade Database, China has delivered YJ-9E to Zambia that will be mounted of L-15 combat/trainer aircraft.

<https://www.navyrecognition.com/index.php/focus-analysis/naval-technology/9960-chinese-navy-conducts-firing-test-of-new-yj-9-anti-ship-missile-from-z-9d-naval-helicopter.html>



Chinese Navy conducts live firing of YJ-9 anti-ship missile launched from a Z-9D naval helicopter. (Picture source video footage CCTV)



Sun, 11 April 2021

## बड़ी सफलता: सिर्फ 10 सेकंड से भी कम समय में ये उपकरण बता देगा कहां छिपा है बम, जानिए कैसे करता है ये काम

केंद्रीय मंत्री ने बताया कि नैनोस्निफर पहला माइक्रोसेंसर आधारित विस्फोटक ट्रेस डिटेक्टर है, जो 10 सेकंड से भी कम समय में विस्फोटक सामग्री का पता लगा सकता है

Edited By: अंकित त्यागी

विस्फोटक को महज 10 सेकंड के भीतर डिटेक्ट करने के लिए IIT बॉम्बे द्वारा संरक्षित एक स्टार्टअप ने नैनोस्निफर डिटेक्टर विकसित किया है। एयरपोर्ट से लेकर रेलवे स्टेशन, मेट्रो समेत अन्य पब्लिक स्थानों पर विस्फोटक डिटेक्टर एक जरूरी उपकरण बन गया है। ऐसे स्थानों के चेक प्वाइंट पर लोगों और सामान की तेजी से स्कैनिंग के लिए उन्नत पहचान उपकरणों का होना आवश्यक है। बताया जा रहा है कि ऐसे जगहों पर नोस्निफर एक सही विकल्प साबित होगा।

केंद्रीय शिक्षा मंत्री रमेश पोखरियाल ने नैनोस्निफर तकनीक के द्वारा विकसित नैनोस्निफर डिटेक्टर को आत्मनिर्भर भारत की ओर एक बड़ा कदम बताया है।

### नैनोस्निफर है 100 फीसदी मेड इन इंडिया

केंद्रीय शिक्षा मंत्री रमेश पोखरियाल ने बताया कि नैनोस्निफर अनुसंधान, विकास और निर्माण के मामले में 100 फीसदी मेड इन इंडिया उत्पाद है। नैनोस्निफर की मूल तकनीक अमेरिका और यूरोप में पेटेंट द्वारा संरक्षित है, उन्होंने आगे कहा कि यह किफायती उपकरण आयातित विस्फोटक ट्रेस डिटेक्टर उपकरणों पर हमारी निर्भरता को कम करेगा।

10 सेकंड से भी कम समय में लगा लेता है विस्फोटक का पता

केंद्रीय मंत्री ने बताया कि नैनोस्निफर पहला माइक्रोसेंसर आधारित विस्फोटक ट्रेस डिटेक्टर है, जो 10 सेकंड से भी कम समय में विस्फोटक सामग्री का पता लगा सकता है। यह अलग-अलग तरह के विस्फोटक को पहचानता है और उन्हें उसी अनुरूप वर्गीकृत भी करता है। यह सैन्य, पारंपरिक और घर के बने विस्फोटकों का पता आसानी से लगा लेता है। नैनोस्निफर आवाज और दृश्य दोनों रूप से अलर्ट करता है।

### विस्फोटक के छोटे-छोटे अंश को भी ढूंढ सकता है

उन्होंने कहा कि इसकी मदद से न केवल हमारी पुलिस, सुरक्षा बल और सैन्य सुरक्षा को मजबूती मिलेगी बल्कि नागरिक उड्डयन को भी एक नया सुरक्षा कवच मिलेगा। इस उत्पाद की मदद से विस्फोटक के छोटे-छोटे अंश को भी ढूंढा जा सकता है और उचित कार्रवाई की जा सकती है।



Indian Army

बता दें कि नैनोस्निफर ने पुणे स्थित DRDO की उच्च ऊर्जा सामग्री अनुसंधान प्रयोगशाला (HEMRL) परीक्षण को सफलतापूर्वक पार कर दिया है और देश की उच्च आतंकवाद रोधी बल राष्ट्रीय सुरक्षा गार्ड (NSG) द्वारा भी इसका परीक्षण भी किया गया है।

### प्रतिभाशाली, जानकार और परिश्रमी उद्यमियों से भरा है हमारा राष्ट्र

केंद्रीय शिक्षा मंत्री ने कहा कि इस उत्पाद ने यह साबित किया कि आईआईटी बॉम्बे और आईआईटी दिल्ली अपनी ऑफशूट कंपनियों के साथ मिलकर देश की सुरक्षा के लिए उन्नत और सस्ती स्वदेशी उत्पादों का निर्माण कर एक ईमानदार प्रयास कर रहे हैं।

हमें विदेशी उत्पादों का आयात क्यों करना चाहिए जब हमारा राष्ट्र प्रतिभाशाली, जानकार और परिश्रमी उद्यमियों से भरा हुआ है। अब हमारा देश बड़ी मात्रा में नैनो उत्पादों, विस्फोटक ट्रेस डिटेक्टरों जैसे उत्पादों का विकास और निर्माण कर रहा है।

<https://www.tv9hindi.com/knowledge/explosive-detection-device-will-strengthen-security-forces-in-less-than-10-seconds-know-how-nanosenifer-work-611496.html>

**THE TIMES OF INDIA**

Mon, 12 April 2021

## Gaganyaan: 4 astronaut-elects return from Russia; India training to begin

By Chethan Kumar

The four Indian astronaut-elects have successfully completed their training in Russia and have arrived in Bengaluru recently. Having familiarised themselves with basic astronaut training the four IAF test pilots, now employees of Isro, will soon start with the mission-specific training that will happen in multiple Indian cities.

Dmitry Loskutov, director general, Glavkosmos, the organisation with whom Isro has a contract for astronaut training had told TOI in March: "...Indian astronauts didn't need any special final exam given that they had passed all the tests and exams in the process of their preparation, he had said that the Russian module was set to complete no later than the end of March and that Isro will determine when they are supposed to return to India."

ISRO chairman K Sivan, confirming their return, said: "They are in Bengaluru and will soon start on the mission-specific training that will happen in different parts of the country. For instance, the Gaganyaan module-specific training — different conditions and reactions they need — will all happen in Bengaluru, while buoyancy and water survival tests and training will happen at NIOT (National Institute of Ocean Technology) in Chennai. We've roped in IAF, army and navy too."

Some of the centrifuge tests will happen at the Institute of Aerospace Medicine (IAM) while physical and some simulator training will happen at the Isro Satellite Integration and Testing Establishment (ISITE), both in Bengaluru.

"The Indian module will be a prolonged training, not just for one or two months. The training with the crew module will be very very crucial. At the moment only engineers understand these systems and astronauts need to understand that. It is not like student-learning, they need to become experts," Sivan added.



Training in Russia was generic and their Gaganyaan-specific training — medical training, psychological training, advanced training, and flight simulation training — will happen now. While the medical training will be a continuous process up to the time of launch, the psychological training will help manage stress in zero-gravity environments, work fatigue, etc.

The advanced training will involve familiarisation of systems, including launch vehicles. This will mostly be theory that will help astronaut-elects understand various systems that will launch them into space and bring them back safely.

After this, they will start the most important part of their training — flight simulation. Here, they will be taught how to use safety instruments, intervene manually to operate flight systems in case something goes wrong, how to take photographs of Earth and so on.

While they also underwent some survival training in Russia, they will need to be trained on the same in Indian conditions.

Further, Isro will be building or procuring new simulators that will provide advanced training to the astronaut-elects in Bengaluru. The crew and service simulators will be developed by Isro with the help of industries, which will allow astronauts to train on using onboard survival kits, operation of various systems such as orbital monitoring, Sivan said, adding that apart from all this, astronauts will have a regular schedule of aircraft flying to keep them active.

<https://timesofindia.indiatimes.com/india/gaganyaan-4-astronaut-elects-return-from-russia-india-training-to-begin/articleshow/82017824.cms>

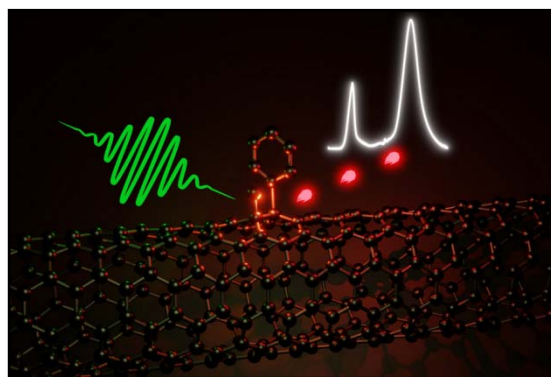


*Sat, 10 April 2021*

## Optically active defects improve carbon nanotubes

Nobel laureate Herbert Kroemer once famously asserted "The interface is the device." The observations by the Sydney researchers could therefore spark a new debate on whether interfaces—which are physical boundaries separating different regions in materials—are a viable solution to the unreliability of next-generation devices.

The properties of carbon-based nanomaterials can be altered and engineered through the deliberate introduction of certain structural "imperfections" or defects. The challenge, however, is to control the number and type of these defects. In the case of carbon nanotubes—microscopically small tubular compounds that emit light in the near-infrared—chemists and materials scientists at Heidelberg University led by Prof. Dr. Jana Zaumseil have now demonstrated a new reaction pathway to enable such defect control. It results in specific optically active defects—so-called  $sp^3$  defects—which are more luminescent and can emit single photons, that is, particles of light. The efficient emission of near-infrared light is important for applications in telecommunication and biological imaging.



Usually defects are considered something "bad" that negatively affects the properties of a material, making it less perfect. However, in certain nanomaterials such as carbon nanotubes these "imperfections" can result in something "good" and enable new functionalities. Here, the precise type of defects is crucial. Carbon nanotubes consist of rolled-up sheets of a hexagonal lattice of  $sp^2$  carbon atoms, as they also occur in benzene. These hollow tubes are about one nanometer in diameter and up to several micrometers long.

Through certain chemical reactions, a few  $sp^2$  carbon atoms of the lattice can be turned into  $sp^3$  carbon, which is also found in methane or diamond. This changes the local electronic structure of

the carbon nanotube and results in an optically active defect. These sp<sup>3</sup> defects emit light even further in the near-infrared and are overall more luminescent than nanotubes that have not been functionalised. Due to the geometry of carbon nanotubes, the precise position of the introduced sp<sup>3</sup> carbon atoms determines the optical properties of the defects. "Unfortunately, so far there has been very little control over what defects are formed," says Jana Zaumseil, who is a professor at the Institute for Physical Chemistry and a member of the Centre for Advanced Materials at Heidelberg University.

The Heidelberg scientist and her team recently demonstrated a new chemical reaction pathway that enables defect control and the selective creation of only one specific type of sp<sup>3</sup> defect. These optically active defects are "better" than any of the previously introduced "imperfections." Not only are they more luminescent, they also show single-photon emission at room temperature, Prof. Zaumseil explains. In this process, only one photon is emitted at a time, which is a prerequisite for quantum cryptography and highly secure telecommunication.

According to Simon Settele, a doctoral student in Prof. Zaumseil's research group and the first author on the paper reporting these results, this new functionalisation method—a nucleophilic addition—is very simple and does not require any special equipment. "We are only just starting to explore the potential applications. Many chemical and photophysical aspects are still unknown. However, the goal is to create even better defects."

This research is part of the project "Trions and sp<sup>3</sup>-Defects in Single-walled Carbon Nanotubes for Optoelectronics" (TRIFECTs), led by Prof. Zaumseil and funded by an ERC Consolidator Grant of the European Research Council (ERC). Its goal is to understand and engineer the electronic and optical properties of defects in carbon nanotubes.

"The chemical differences between these defects are subtle and the desired binding configuration is usually only formed in a minority of nanotubes. Being able to produce large numbers of nanotubes with a specific defect and with controlled defect densities paves the way for optoelectronic devices as well as electrically pumped single-photon sources, which are needed for future applications in quantum cryptography," Prof. Zaumseil says.

**More information:** Simon Settele et al. Synthetic control over the binding configuration of luminescent sp<sup>3</sup>-defects in single-walled carbon nanotubes, *Nature Communications* (2021). DOI: [10.1038/s41467-021-22307-9](https://doi.org/10.1038/s41467-021-22307-9)

**Journal information:** [\*Nature Communications\*](#)

## Researchers produce cost-effective, environmentally friendly glass material

Glass is ubiquitous in high-tech products in the fields of optics, telecommunications, chemistry and medicine, and in everyday objects such as bottles and windows. However, shaping glass is mainly based on processes such as melting, grinding or etching. These processes are decades old, technologically demanding, energy-intensive and severely limited in terms of the shapes that can be realized. For the first time, a team led by Prof. Dr. Bastian E. Rapp from the Laboratory of Process Technology at the Department of Microsystems Engineering at the University of Freiburg, in collaboration with the Freiburg-based start-up Glassomer, has developed a process that makes it possible to form glass easily, quickly and in almost any shape using injection molding. The researchers presented their results in the journal *Science*.

"For decades, glass has often been the second choice when it comes to materials in manufacturing processes because its formation is too complicated, energy-intensive and unsuitable for producing high-resolution structures," explains Rapp. "Polymers, on the other hand, allow all of this, but their physical, optical, chemical and thermal properties are inferior to glass. As a result, we have combined polymer and glass processing. Our process will allow us to quickly and cost-effectively replace both mass-produced products and complex polymer structures and components with glass."

Injection molding is the most important process in the plastics industry and enables the fast and cost-effective production of components in so-called high-throughput in almost any shape and size. Transparent glass could not be molded in this process until now. With the newly developed Glassomer injection molding technology from a special granulate designed in-house, it is now possible to also mold glass in high throughput at just 130 °C. The injection-molded components from the 3D printer are then converted into glass in a heat treatment process: The result is pure quartz glass. This process requires less energy than conventional glass melting, resulting in energy efficiency. The formed glass components have a high surface quality, so that post-treatment steps such as polishing are not required.

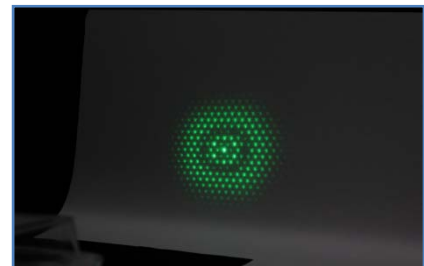
The novel designs made possible by Glassomer's glass injection molding technology have a wide range of applications from data technology, optics and solar technology to a so-called lab-on-a-chip and medical technology. "We see great potential especially for small high-tech glass components with complicated geometries. In addition to transparency, the very low coefficient of expansion of quartz glass also makes the technology interesting. Sensors and optics work reliably at any temperature if the key components are made of glass," explains Dr. Frederik Kotz, group leader at the Laboratory of Process



Complex structures of transparent fused silica fabricated via injection molding of the newly developed Glassomer composite. Credit: Glassomer GmbH



Transparent fused silica gears produced by injection molding of the newly developed Glassomer composite. Credit: Glassomer GmbH



Characteristic light refraction pattern when the microstructure is illuminated with a laser. Credit: Glassomer GmbH



Technology and Chief Scientific Officer (CSO) at Glassomer. "We have also been able to show that micro-optical glass coatings can increase the efficiency of solar cells. This technology can now be used to produce cost-effective high-tech coatings with high thermal stability. There are a number of commercial opportunities for it."

The team around Frederik Kotz and Markus Mader, a doctoral student at the Laboratory of Process Technology, solved previously existing problems in the injection molding of glass such as porosity and particle abrasion. In addition, key process steps in the new method were designed to use water as the base material, making the technology more environmentally friendly and sustainable.

**More information:** High-throughput injection molding of transparent fused silica glass. *Science*, DOI: [10.1126/science.abf1537](https://doi.org/10.1126/science.abf1537)

**Journal information:** *Science*  
<https://phys.org/news/2021-04-cost-effective-environmentally-friendly-glass-material.html>

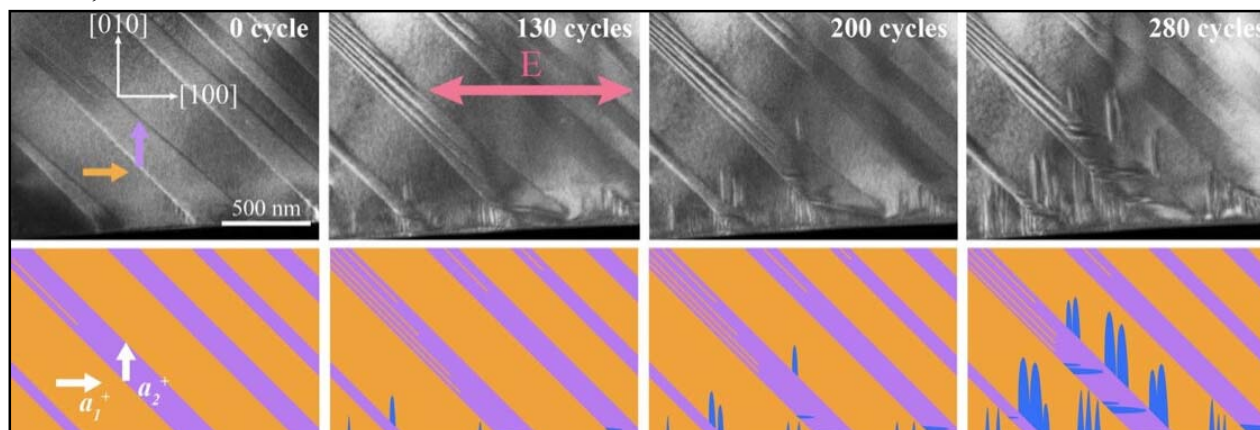


Sat, 10 April 2021

## Discovery could lengthen lifespan of electronic devices

Nobel laureate Herbert Kroemer once famously asserted "The interface is the device." The observations by the Sydney researchers could therefore spark a new debate on whether interfaces—which are physical boundaries separating different regions in materials—are a viable solution to the unreliability of next-generation devices.

"Our discovery has indicated that interfaces could actually speed up ferroelectric degradation. Therefore, better understanding of these processes is needed to achieve the best performance of devices," Dr. Chen said.



Electron microscopy images show the degradation in action. Credit: University of Sydney

Ferroelectric materials are used in many devices, including memories, capacitors, actuators and sensors. These devices are commonly used in both consumer and industrial instruments, such as computers, medical ultrasound equipment and underwater sonars.

Over time, ferroelectric materials are subjected to repeated mechanical and electrical loading, leading to a progressive decrease in their functionality, ultimately resulting in failure. This process is referred to as 'ferroelectric fatigue.'

It is a main cause of the failure of a range of electronic devices, with discarded electronics a leading contributor to e-waste. Globally, tens of millions of tons of failed electronic devices go to landfill every year.

Using advanced in-situ electron microscopy, the School of Aerospace, Mechanical and Mechatronic Engineering researchers were able to observe ferroelectric fatigue as it occurred. This technique uses an advanced microscope to 'see,' in real-time, down to the nanoscale and atomic levels.

The researchers hope this new observation, described in a paper published in *Nature Communications*, will help better inform the future design of ferroelectric nanodevices.

"Our discovery is a significant scientific breakthrough as it shows a clear picture of how the ferroelectric degradation process is present at the nanoscale," said co-author Professor Xiaozhou Liao, also from the University of Sydney Nano Institute.

Dr. Qianwei Huang, the study's lead researcher, said: "Although it has long been known that ferroelectric fatigue can shorten the lifespan of electronic devices, how it occurs has previously not been well understood, due to a lack of suitable technology to observe it."

Co-author Dr. Zibin Chen said: "With this, we hope to better inform the engineering of devices with longer lifespans."

**More information:** Qianwei Huang et al. Direct observation of nanoscale dynamics of ferroelectric degradation, *Nature Communications* (2021). DOI: [10.1038/s41467-021-22355-1](https://doi.org/10.1038/s41467-021-22355-1)

**Journal information:** [Nature Communications](https://www.nature.com/articles/s41467-021-22355-1)  
<https://phys.org/news/2021-04-discovery-lengthen-lifespan-electronic-devices.html>

## COVID-19 Research News

# Business Today

Mon, 12 April 2021

## 20-30% recovered people lose natural immunity against COVID-19 in 6 months

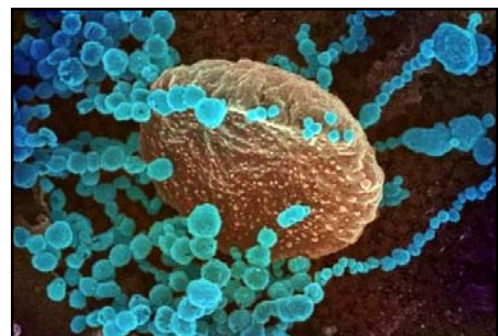
*According to research by the Institute of Genomics and Integrative Biology (IGIB), natural immunity against COVID-19 lasts for 6 to 7 months. It also states that between 20-30% of those infected with the virus shed this immunity after a 6-month period*

India is currently dealing with the second wave of COVID-19. As cases surge, a question that is often asked by people who had contracted the virus and recovered from it is - how long does natural immunity against coronavirus last?

According to research by the Institute of Genomics and Integrative Biology (IGIB), natural immunity against COVID-19 lasts for 6 to 7 months. It also states that between 20-30% of those infected with the virus shed this immunity after a 6-month period.

"The key finding of 20-30% of subjects losing virus neutralizing activity, despite staying seropositive, at 6 month follow-up helps understand why the large second wave has not spared cities like Mumbai with high seropositivity," Dr Anurag Agarwal, the director of IGIB stated on Twitter.

The findings of this research are particularly important for India as they could potentially explain the timing of the second wave of the COVID-19 pandemic in the country. The results also emphasise the importance of vaccination against virus infection.



The IGIB study established that seropositivity was inversely proportional to the test positivity rate of COVID-19

Research on the immunity period of COVID-19 vaccines is still ongoing, but most vaccines currently in use are expected to protect beneficiaries from severe coronavirus infection or death for at least a couple of years.

Researchers have stated that the findings can explain why cities like Mumbai and Delhi are experiencing a spike in COVID-19 cases. This is happening despite these cities having high seropositivity, according to Hindustan Times. Delhi had average seropositivity of just over 56 per cent in January. Many doctors attributed Delhi's seropositivity as the reason behind the slowdown of the COVID-19 pandemic surge in November 2020.

The IGIB study established that seropositivity was inversely proportional to the test positivity rate of COVID-19.

"In September, when we conducted a sero-survey across CSIR (Council for Scientific and Industrial Research) laboratories, just over 10% of the participants were found to have antibodies against the virus. Then, we followed up with a fraction of these participants for three and five to six months and conducted a quantitative test to check their antibody levels," said Dr Shantanu Sengupta, according to the daily. Sengupta is a senior scientist from IGIB and one of the writers of the study which was published in eLife journal on April 10. "At five to six months, nearly 20 per cent of the participants had lost the neutralisation activity despite having antibodies; the neutralisation activity for the rest was also on the decline."

Nearly 10 per cent of the participants of the study tested positive for antibodies in September 2020. The researchers tracked 175 of these participants for a period of five to six months and discovered that 31 of them had lost the neutralising activity and eight of them no longer had antibodies.

<https://www.businesstoday.in/latest/trends/20-30-recovered-people-lose-natural-immunity-against-covid-19-in-6-months/story/436312.html>

