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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,  
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Sat, 07 May 2022

### **आकाश प्राइम मिसाइल की खासियतें क्या हैं, कैसे यह भारतीय सेना को मजबूत करेगा?**

आत्मनिर्भर भारत अभियान के तहत भारत रक्षा प्लेटफार्मों और अलग-अलग तरह की मिसाइलों का निर्माण करके लगातार एयरो स्पेस की दुनिया में अपनी क्षमताओं को बढ़ा रहा है। इसी क्रम में सेना ने "मेक इन इंडिया" वायु रक्षा मिसाइल प्रणाली खरीदने के लिए सरकार के सामने प्रस्ताव रखा है। अब भारतीय सेना को दुश्मन के विमानों और ड्रोन को मार गिराने की अपनी क्षमता को बढ़ावा देने के लिए आकाश प्राइम मिसाइल की दो नई रेजिमेंट मिलेंगी। हालांकि, भारतीय सेना के पास पहले से ही आकाश मिसाइल डिफेंस सिस्टम की दो रेजिमेंट हैं, जिन्हें गलवान घाटी में हिंसा के बाद चीन सीमा पर तैनात किया गया था। अब दो और रेजिमेंट मिलने से देश की वायु रक्षा को और अधिक मजबूती मिलेगी। आकाश मिसाइल को सबसे सफल मिसाइलों में माना जाता है। बता दें कि सेना के पास पहले से ही आकाश मिसाइल की दो रेजिमेंट हैं। आइए जानते हैं इसकी खासियतों के बारे में।

#### **सबसे सफल स्वदेशी मिसाइलों में से एक**

डिफेंस रिसर्च एंड डेवलपमेंट ऑर्गनाइजेशन (DRDO) द्वारा डिजाइन और विकसित और भारत डायनामिक्स लिमिटेड (BDL) द्वारा निर्मित आकाश मिसाइल भारतीय सेना और वायु सेना में शामिल की गई सबसे सफल स्वदेशी मिसाइलों में से एक है। इस मिसाइल को 2014 में भारतीय वायु सेना में और 2015 में भारतीय सेना में शामिल किया गया था। 96 फीसदी स्वदेशी तकनीक पर आधारित यह देश का सबसे महत्वपूर्ण मिसाइल सिस्टम है जिसे अब दूसरे देशों को भी निर्यात करने की मंजूरी सरकार से मिल चुकी है। इस मिसाइल का प्रदर्शन कई अंतरराष्ट्रीय प्रदर्शनियों जैसे डिफेंस एक्सपो, एयरो इंडिया के दौरान भी किया गया। आकाश मिसाइल सिस्टम को खरीदने में पूर्वी एशिया और अफ्रीका के 9 देशों ने दिलचस्पी दिखाई है।

## आकाश प्राइम मिसाइल की खासियतें

1. आकाश प्राइम मिसाइलें बेहतर सटीकता के लिए स्वदेशी सक्रिय रेडियो फ्रीक्वेंसी (आरएफ) से लैस हैं. आकाश प्राइम मिसाइल की खासियतें क्या हैं, कैसे यह भारतीय सेना को मजबूत करेगा?
2. आकाश के पुराने संस्करण के विपरीत प्राइम मिसाइल को उच्च ऊंचाई पर कम तापमान वाले वातावरण में अधिक विश्वसनीयता सुनिश्चित करने के लिए अपग्रेड किया गया है.
3. मौजूदा आकाश प्राइम प्रणाली ने परीक्षणों के दौरान भारतीय सेना और भारतीय वायु सेना के विश्वास को और बढ़ाया है.
4. मिसाइल को 4,500 मीटर तक की ऊंचाई पर तैनात करके लगभग 25-30 किलोमीटर की दूरी पर लक्ष्य को मार गिराया जा सकता है.

दो रेजिमेंट जोड़ने का प्रस्ताव - दरअसल, भारतीय सेना पाकिस्तान और चीन के साथ सीमा पर तैनाती के लिए दो और रेजिमेंट जोड़ना चाहती है. भारतीय सेना ने रक्षा मंत्रालय के सामने आकाश प्राइम मिसाइलों की दो रेजिमेंट बनाने का प्रस्ताव रखा है. नई आकाश मिसाइलों में पूर्व के संस्करणों की तुलना में बेहतर प्रदर्शन रेंज है इसका प्राथमिक उद्देश्य पाकिस्तान और चीन के साथ पहाड़ी सीमाओं पर किसी भी विमान की घुसपैठ से बचना है. इसके अधिग्रहण की लागत 10,000 करोड़ रुपए होगी. भारतीय सेना के पश्चिमी और दक्षिण पश्चिमी कमानों ने आकाश प्राइम मिसाइलों के मौजूदा संस्करण की लगभग एक दर्ज परीक्षण फायरिंग की है.

<https://www.tv9hindi.com/knowledge/what-are-the-features-of-akash-missile-how-will-it-strengthen-the-indian-army-a114-1219164.html>



*Sat, 07 May 2022*

## Indian Army to acquire two Akash Prime missile regiments

Seven months after the Defence Research and Development Organisation (DRDO) successfully flight-tested “Akash Prime”, the latest version of the indigenously developed medium range, surface to air missile (SAM) system Akash, the Indian Army has sent a proposal to the Union government to acquire two regiments of the air defence system. Capable of simultaneously engaging multiple targets in group mode or autonomous mode, the Akash missile system has a built-in Electronic Counter-Counter Measures (ECCM) features and has been configured for a mobile platform. The full system comprises a launcher, set of missiles, a control centre, a built-in mission guidance system, a C4I (command, control communication and intelligence) centre and supporting ground equipment in addition to its radar, which has been christened Rajendra.

Presently, the Army has four Akash regiments. Consisting of four 3D phased array radars (Rajendra), the Akash battery comprises of four launchers with three missiles each.

Last September, the Akash Prime missile had successfully intercepted and destroyed an unmanned aerial target that mimicked an enemy aircraft. The missile system was developed by the Defence Research and Development Laboratory (DRDL), Hyderabad, in collaboration with other DRDO laboratories under the Missiles and Strategic Systems (MSS). It is manufactured by Bharat Electronics Limited (BEL) and Bharat Dynamics Limited (BDL).

Officials from the DRDO told *Frontline* that though the Akash Prime had an operational range similar to its predecessor—27-30 km and a flight altitude of around 18 km—it was equipped with an indigenously developed active radio frequency (R.F.) seeker for improved accuracy. Other improvements have also been incorporated into the missile in order to ensure a more reliable performance under low-temperature environments at higher altitudes.

<https://frontline.thehindu.com/dispatches/indian-army-to-acquire-two-akash-prime-missile-regiments/article38485915.ece>

## Defence News

## Defence Strategic: National/International



Mon, 09 May 2022

### **Adoption of Artificial Intelligence in Indian Army's C4ISR: Here is what the Chief said**

One of the major lessons learnt from the ongoing Ukraine-Russia war is that multi-domain battle space is getting more influenced by technology. And these include usage of swarms of drones, missiles, unmanned ground vehicles and more. And all of these are being driven by Artificial Intelligence or computer algorithms – these are used in the war zones to not only process huge quantities of information, but have the ability to make decisions.

“Artificial intelligence is definitely being leveraged for enhancing the current C4ISR capabilities. The National Task Force had identified the 12 AI domains and the Indian Army has since undertaken projects both in-house as well as with the industry, especially deep tech start-ups,” the Indian Army Chief Gen Manoj Pande told Financial Express Online. To effectively build capabilities for C4ISR, there is a need to integrate and build capacities in emerging domains of IoT, 5G and BDA.

## Why?

Because by meshing these emerging domains it will enable the military to effectively link the sensor to the decision maker to the shooter.

### AI engines in various facets of C4ISR

They range from sensors to analysis and decision support systems, and are currently under development – standalone and part of platforms or systems. For instance, in the sensor domain — swarm drone platforms, surveillance system inputs or autonomous platforms, AI is enabling remote target detection as well as classification. ISR analysis: According to Gen Pande, “AI engines are being trained for interpretation, change and anomaly detection and even intrusion detection. Similarly, in domains of autonomous lethal weapons, decision support systems or predictive maintenance, a serious effort is afoot to leverage AI.”

Adding, “We realise that to build an effective C4ISR grid, there is a need to get our data strategy right. And towards this, we have promulgated a Data Governance policy. Work is going on towards building a structured data management framework. Meanwhile, we need to churn out data for our AI engines through improvised on-the-fly techniques.” While evolving QR for any system, the use of AI is deliberated for its ability to enhance operational or logistic effectiveness. Therefore, the Indian Army has also established the AI Centre of Excellence (COE) at MCTE, Mhow. And at this facility, “For skill development for our soldiers, AI development is being undertaken simultaneously.”

<https://www.financialexpress.com/defence/adoption-of-artificial-intelligence-in-indian-armys-c4isr-here-is-what-the-chief-said/2518093/lite/>



*Mon, 09 May 2022*

## **Adequate forces are available to deal with all types of contingencies along LAC: Army Chief**

Even as the Indian Army soldiers continue to hold important positions along the Line of Actual Control (LAC), China seems to lack intention to find resolution of border disputes. Responding to a question about the current situation at the border and intention of China, in an interaction with a select group of media-persons, new Indian Army Chief Gen Manoj Pande said on Monday, “The basic issue remains the resolution of the border. What we see is that China’s intent has been to keep the boundary issue alive.” Adding, “What we need as a country is a ‘Whole of nation’ approach and in the military domain, this is to prevent and counter any attempt to alter the status quo at the LAC.”

“Our guidance to the troops is to be firm and resolute and to make sure there is no attempt to change the status quo,” he added. The aim of the Indian Army to establish status quo ante prior to the 2020 incident and also to re-establish trust and tranquillity in that region. However, according to Gen Pande, it cannot be a one way affair. “Efforts need to be made from both

sides.” In the last couple of years, according to the Indian Army Chief, a decision has been taken to re-orient and re-balance the situation in Eastern Ladakh.

### **Situation along LAC**

According to the chief, the Indian Army is focusing to upgrade Intelligence Surveillance and Reconnaissance (ISR) at the LAC and to also build infrastructure which will help to support operation and logistics. The standoff between the two forces has been going on for almost 2 years now, “Adequate forces are available to deal with all types of contingencies,” he said.

The Indian troops have been taking certain action to have robust posture along LAC and are carrying out re-appraisal and re-assessment.

### **New Technologies in the Indian Army**

As part of the ongoing process of capability development at the entire northern border, Gen Pande said that new technologies are being inducted.

### **How to resolve the border issue with China?**

At the end of 15 rounds of talks at the military and diplomatic level, it resulted in disengagement in North and South of Pangong Tso, Gogra and PP 14 (Galwan valley). A resolution can be found through dialogue — military and diplomatic, he added.

<https://www.financialexpress.com/defence/adequate-forces-are-available-to-deal-with-all-types-of-contingencies-along-lac-army-chief/2517921/lite/>



*Tue, 10 May 2022*

## **Indian Navy aircraft arrives at La Reunion Island for interaction with French Navy**

An Indian Navy P-8I Long Range Maritime Reconnaissance aircraft arrived at La Reunion Island in the southern Indian Ocean on Monday as part of a five-day deployment for interaction with the French Navy. Issuing a statement on Twitter, the Navy spokesperson said that during the deployment, the P8I will also undertake coordinated surveillance missions in areas to enhance maritime security and safety in the Southern Indian Ocean, including the Mozambique Channel. The P8I aircraft which possesses advanced capabilities, endurance and demonstrated reach, has previously operated from La Reunion in March 2020, the Indian Navy informed.

"Indian and French navies have been regularly undertaking coordinated ops, as part of the Varuna series of bilateral exercises," the statement issued by the Navy said. The Indian Navy routinely takes part in bilateral and multilateral exercises, port calls and other activities with friendly countries in the Indian Ocean region. On Sunday, the Navy informed that four ships of the Indian Navy's First Training Squadron reached the port city of Jeddah in Saudi Arabia for a five-nation overseas deployment. The Indian Navy routinely conducts anti-piracy operations in the region, with the Navy's INS Kolkata recently visiting Djibouti from May 4-7 as part of an anti-piracy patrol in the Gulf of Aden.

<https://www.indiandefensenews.in/2022/05/indian-navy-aircraft-arrives-at-la.html?m=1>

*Mon, 09 May 2022*

## **India's strategic status: 2047 AD – ASAT Power**

*By Gp Capt TP Srivastava*

2047 A.D. will be a landmark year in the Indian calendar. India would be completing 100 years since attaining independence from the British regime. First 25 years post-independence were both traumatic as well as formative years for India. India was known as the land of 'Snake Charmers'. A non-aligned nation by choice, India was forced to fight four wars in quick succession, 1948, 1962, 1965 and 1971. At international for a India had insignificant to 'not so significant' standing. Geographical proximity with Russia did help. Russia used VETO power in UNSC against western powers' proposals on Goa and J&K (UNSC resolution 99 and 100 refer). Hungry mouths of millions of Indians were being fed by US grains donated under the PL 480 programme.

Turning point (read opportunity) came from an unexpected quarter. 1971 elections in Pakistan threw up most unexpected results. The Awami League of Sheikh Mujib had won the majority.

'Punjabis' governed Pakistan refused to accept the verdict. Seeds for creation of a new nation were sown. Brutal assault by Pak military in erstwhile East Pakistan led to huge refugee influx in India. Mrs Indira Gandhi, the then PM, led India to accomplish a historical first after second world war. India Military crushed Pak offensive in the west and 'annexed' East Pakistan and created a new nation, Bangla Desh. 2022 and 1971 are a mere nano second apart in the celestial calendar. But the Globe has changed exponentially when viewed with a geo-strategic telescope. Breakup of the Soviet Union was, perhaps, the most unexpected event in the last 50 years. Super power rivalry came to an end with the USA emerging as an uncontested super power. China's multi dimensional growth during the same period, Chinese economy in particular, has challenged the numero uno position of the USA.

### **Nuclear Deterrence as an Instrument of Power and Peace**

Ongoing Russia-Ukraine war, which ought not to have taken place has brought into focus the need for possession of a formidable DETERRENT. Ukraine willingly surrendered its NUKES after the breakup of the Soviet Union to gain spotlight for a few milliseconds and in the process placed its future in inky blue darkness of military blackmail by its neighbour, Russia. Unfortunately for Ukraine, the clock cannot be turned back. A 'nuclear' Ukraine could not have been subjected to such humiliation. Nuclear Deterrent, therefore, has become currency of not only power but peace as well. India may have faced similar conundrum but for the exemplary foresight demonstrated by Indira Gandhi as Prime Minister, who gave green signal to Indian nuclear scientists to go 'NUCLEAR'. It had repercussions in form of condemnation in international fora, sanctions and more importantly birth of a 'Nuclear Pakistan'.

'Buddha' smiled again under the leadership of Atal Bihari Vajpayee as Prime Minister, nearly a quarter century later. India had emerged as a nuclear power. Nuclear deterrent possessed by India ensured that both China and Pakistan individually as well as in sync did not try any major military misadventure during the past 50 years. Instability on both borders will



continue to remain. Highly location centric conflicts viz Kargil with Pakistan and Galwan Valley with China did take place. Border situation with both nations remains volatile and is unlikely to change in the near future. But one thing is certain. Full scale military campaign is out of the question due to nukes in possession of all three nations. Concept of 'Mutually Assured Destruction (MAD)', which was coined during the height of the Cold War has actually become the propagator of maintaining peace by default.

### **Weaponized Space as New Frontier**

But Nuclear Deterrence as an instrument of maintaining peace may not survive in coming decades in view of control of space becoming the next frontier of establishing supremacy. Supremacy in space requires three main capabilities. These are;

- Reliable Launch Vehicle.
- Satellite Fabrication Technology.
- Satellite Neutralisation Capability.

India's Space Research Organisation (ISRO), a shining jewel of world class high technology establishment, has placed India on near equal footing with China and USA. However, India cannot match either nation in the field of launch vehicle capability, both in terms of tonnage as well as frequency of launch. China and the USA are in space. We are yet to launch an Indian in space in an Indian launch vehicle. Establishing a permanent space station by India is still quite some distance away but highly probable and possible but for lack of resources.

India has lost the conventional weapon development race by a few decades in trying to play 'catch up', which is never a winning proposition. India is unlikely to produce any 'big ticket' platform viz Force Multipliers, Heavy Lift Fixed and Rotary wing machines, Strike Aircraft, Armoured Vehicles, Nuclear Submarines, PGMs and so on. List is endless. Total absence and lack of R&D investments in the past six decades has resulted in India becoming one of the largest importers of Military hardware. 'Atmanirbhar Bharat' is a nice slogan. Hamari 'KATHNI aur KARNI' mein bahut fark hai. Before long China may rather demonstrate weaponization of its space station. As and when it happens, the entire constellation of satellites of all nations will become vulnerable. China may exercise both options; Soft as well as Hard Kill.

### **A word about current space stations would be essential.**

- ISS, the US-controlled space station, is a consortium owned space station. ISS is due to retire in 2030.
- Chinese Tiangong is exclusively a Chinese effort. Tianhe Core module of Tiangong will be supplemented by two additional modules Wentian in July and Mengtian in October, 2022
- The Chinese space station is unique. It has a co-orbital companion in the form of the Hubble class Xuntian space telescope but with a 300 times larger field of view.
- Co-orbital capability can be easily transformed into weapon carrying platform as and when needed.
- Need for Anti Satellite Weapons Capability

In 2022 and beyond can we imagine surviving without satellite communication? A nation having a formidable ANTI SATELLITE WEAPON CAPABILITY (ASATWC) can and will blackmail the 'have nots' as has been the case with nukes.

US announcement of observing moratorium on deployment and future development of ASATWC is yet another fine example of US hypocrisy. It is merely a case of repetitive US profligacy. The US developed and used nukes and then preached to the rest of the world about the dangers of nuclear weapons. It is doing the same in the case of ASAT weapons. On 18th April, 2022 Vice President of USA, Ms Kamala Harris was extremely magnanimous in announcing US decision to stop testing ASAT weapons to contain space debris. Currently Direct Attack-Anti satellite (DA-ASAT) capability has been demonstrated by China, India, Russia and USA. Record of tests carried out by these nations is as follows;

- China — January, 2007.
- India — March, 2019.
- Russia — 15th November, 2021. Destroyed a satellite in LEO about 500 km from earth.
- USA — February, 2008. The USA carried out the test on the pretext of destroying a 'rogue' satellite containing Toxic Fuels. Essentially the test was carried out to validate the SM-3 interceptor.

### **India's Space Doctrine**

India is yet to formally announce its space doctrine. However, ISRO has published first-ever assessment of space situational awareness capability and more importantly application of such capability in 2021. ISRO also highlighted the need to track space debris. Doctrinal approach to enunciate India's space doctrine would/should encompass the following

#### **aspects;**

- Development of offensive capability in space.
- Ability to neutralize adversary satellites in LEO.
- Development of 'soft kill' capability of adversary satellites.
- Development of weaponised orbital platforms.

Unlike our nuclear doctrine, which is still coloured by western thoughts of NO FIRST USE, our space doctrine must not be constrained by US hypocrisy of restraining further DA-ASAT destructive testing of satellites.

### **International Stance**

Space debris threat to existing space stations and functional satellites (specially in LEO) has attracted attention of world powers. The United Nations is scheduled to discuss 'SPACE SECURITY' by forming an open ended group. This group is expected to submit its recommendations, which might lead to formulating multilateral legally binding measures nearly akin to Nuclear non-proliferation Treaty. India is not a signatory to NPT. Likewise India must not sign any future treaty on management/control/utilization of space for peaceful purposes and ban on testing/developing Anti Satellite Weapons.

World is likely to witness global realignment of military alliance NATO after the Russia-Ukraine war comes to an end. France and Germany are unlikely to continue to live with unwritten hegemony of the USA. Energy security of EU nations will govern their relations with Russia in the long term.

## **DA-ASAT Weapon; The New Deterrent**

India must not make the same mistake as it did in developing nukes. China exploded its first nuclear device in 1964. We took 10 more years, primarily because of political infirmity. India of 2022 is different. India's demonstrated stand of maintaining and practicing unilateral proactive neutrality in respect of ongoing Russia-Ukraine conflict has placed India as the numero uno 'NON ALIGNED' nation of the globe. Many military strategists propagated the paradox that in 21st century 'soft power' will replace the offensive weapon power. However, the concept 'soft power' as an instrument of control and deterrence has already proved to be a non-starter. The Russia-Ukraine conflict is a near-perfect example of the same.

Ineffectiveness of 'soft power' viz financial and trade sanctions in the short term is of no consequence as is quite evident from the effect of sanctions imposed on Russia by the west. EU nations are still buying oil and gas from Russia and are facing the heat due to sanctions imposed on Russia. The advent of satellite warfare is knocking at the doors. Fortunately India is extremely well placed to be among the front runners in this race unlike conventional weapons race, which India lost by more than few decades. ISRO is already planning a possible mission to Venus, manned and unmanned Gaganyaan, another attempt at soft landing on the moon, development of heavier load launch vehicle and so on. These developments would also enhance India's ICBM capability.

Concept of an unmanned space station, which can be weaponized as and when required, would probably be an ideal answer to ISS and Tiangong. Possible weaponry could include DA-ASAT as well as a Laser weapon.

## **India's National Security Imperatives**

India's national security imperatives have a different dimension altogether because India is not part of any military alliance, at least as yet. Future of QUAD is at best uncertain. India must not stop development of DA-ASAT weapons capability. Few more trials would be required to prove the reliability. Fake concerns of world powers should be ignored. Recent events have proved that the biggest 'ROGUE NATIONS' on the globe are P-5 nations. No less than the current head of the UN has hinted the same. All P-5 nations continue to abuse the privilege of 'VETO' to suit their needs. India's quest for a seat in UNSC has become irrelevant.

China will continue to pose major challenges to India's security but not by conventional weapons route. China's expansion of ICBM Silos from ZERO (two years back) to 360 (as in April, 2022) is the most significant development India must take note of. To beat China at its own game, India must adopt a highly proactive stance of development of DA- ASAT weapons and formidable and reliable satellite launch and fabrication capability. Self proclaimed military strategists of India would do well to move over from 'CDS and THEATRE COMMAND' conundrum to looking beyond, 25 years from now and advise/influence the powers that be to make a choice. Without Nuclear and DA-ASAT weapons capability India will not achieve leadership role in international affairs.

<https://www.financialexpress.com/defence/indias-strategic-status-2047-ad-asat-power/2517524/lite/>

*Mon, 09 May 2022*

## **The Defence offset quagmire**

The Ministry of Defence (MoD) seems to be unable to figure out what has gone wrong with the offset policy introduced with much fanfare in 2005 and how to fix the problems it has engendered since then. At the last count, MoD had signed 57 offset contracts with several foreign vendors, involving an estimated offset obligation of USD 13.52 billion to be discharged by them from 2008 to 2033. According to a March 2012 report of the Standing Committee on Defence, these vendors had submitted offset claims worth S 4.59 billion till January 2022, which was USD 2.21 billion less than the value of claims due to be submitted by them.

In April, Minister of State for Defence Ajay Bhatt informed Rajya Sabha that in the last five years till December 2021, vendors had defaulted on their offset obligation in 21 contracts resulting in the value of the unperformed offsets going up to USD 2.24 billion. In 16 of these contracts, he added, a penalty amounting USD 43.14 million had been imposed. To add to this grim picture, out of USD 4.59 billion worth of claims received by MoD, it was able to ‘dispose of’ claims -implying acceptance of offset credit to be given to the vendor after audit-worth USD 3.37 billion only. The rest of the claims were still being audited by the Defence Accounts Department or awaiting response to the audit observations from the vendors.

This reflects poorly on the offset policy which has been reviewed, revised, improved, and simplified at least six times since 2015, evidently without producing the desired results. For one thing, there has hardly been any transfer of technology, and for another, most of the offset business has been garnered by a handful of Indian companies, though the downstream companies have also indirectly benefited. In the circumstances, MoD has been doing what it does the best: blaming the vendors for the poor performance.

There is a view that the vendors are not very keen to honour their offset obligations and purposely delay execution of the offset contracts on one pretext or the other in the hope that, ultimately, they will be able to get away with it by paying some nominal penalty. In September 2020, Comptroller and Auditor General (C&AG) of India submitted a performance audit report on management of defence offsets, which had this to say: “Audit found that in many cases vendors make offset commitments in order to get the main contract. But later they were not earnest about fulfilling these commitments and raised new issues which delayed offset implementation.”

The report goes on to detail four instances of dilly-dallying by the vendors. However, the inference drawn in each one of these is debatable, as the underlying assumption in all of them is that the vendors faced no genuine difficulties in discharging the contractual obligations and that MoD’s intransigence played no part in it. It is unthinkable that the foreign vendors -most of them reputed defence companies which operate worldwide- would purposely default on contractual obligations, be happy to have their reputation sullied and be penalised, and not mind facing the prospect of being blacklisted. Such prejudicial views are not conducive to building mutual trust and understanding between the vendors and MoD which is essential for smooth execution of the offset contracts, or any other contract for that matter.

In theory, vendors have the freedom to choose the avenues for discharging the offset obligations, select Indian Offset Partners (IOPs) and change them midway, fix and rephrase the offset implementation schedule, etc. But, in practice, this freedom is not unfettered as the vendors require MoD's approval at every stage starting with the submission of the offset proposal. Lack of mutual trust lies at the heart of these excessive controls.

Considering that the offset guidelines clearly state which Indian companies qualify as IOPs, which avenues are available to the vendors to discharge their offset obligation, which products qualify for offset credits, etc., there is no need for this excessive control which impacts smooth execution of the offset contracts. Some of these controls, especially those related to changing the IOPs, avenues for discharging offsets, and the yearly schedule for execution of the contract, need to be done away with. An objective analysis of the offset contracts, especially the circumstances in which so many vendors have defaulted on the contractual obligations may throw up other ideas for preventing defaults in future. That said, there is a strong case for considering revocation of the offset policy.

Earlier, all foreign contracts exceeding Rs 300 crore entailed offset obligation. This threshold was raised to Rs 2,000 crore in 2016, which reduced the number of contracts entailing offset obligation. This number would come down further with all ab initio single source procurements from abroad now being exempted from offsets and the growing emphasis on procurement only from the Indian sources. Meanwhile, the problems faced, or likely to be faced, by the vendors in implementing the ongoing contracts need special attention. Rather than focussing on imposition of penalties for default, which is counterproductive, MoD should either resolve the problems that are holding up execution of the contract or take some ad hoc steps to bring a closure to these troubled contracts. The need for an honourable exit policy has acquired urgency as some vendors are believed to have thrown up their hands and announced that they are not able to execute the contract.

Some analysts have suggested setting up of a problem-cum-dispute resolution mechanism to offer a way out to the vendors who are facing difficulties in discharging the offset obligation. Conceptually, this is a good idea, but it is difficult to visualise how such a mechanism helps, especially in view of the understandable disinclination of the bureaucracy to give any concession, or show any accommodation, to the vendors which could later be questioned by the vigilance and audit agencies.

<https://www.financialexpress.com/defence/the-defence-offset-quagmire/2517158/lite/>



*Tue, 10 May 2022*

## **J-K cops to be armed with Corner Shot Weapon System**

The highly sophisticated 'Zen ShootEdge' corner shot pistol weapon system will be inducted by the Jammu and Kashmir Police for close combat and 100 of these will be delivered, according to company officials. It facilitates shooting around corners and over the top of walls, without exposing the person using the pistol, they said. Security officials said that this modern weapon

will protect members of anti-terrorist operation parties from coming in direct fire from terrorists in close combat, which mostly takes place in congested and populated areas in Kashmir. "Recently, we have received an order from the Jammu and Kashmir Police for (procurement of) 100 such systems," Senior Manager Sales, Zen Technologies, Baljeet Singh, told PTI.

The weapon system had been put on display by Zen technologies at the two-day Northern Tech Symposium organised by the Indian Army in Jammu and Kashmir's Udhampur district to identify cutting-edge technologies it needs for solving operational challenges. The symposium ended on Sunday. Singh said that it is under manufacturing and will be delivered to the police force in the next two to three months period. "The National Security Guard (NSG) has procured it," he added. The 'ShootEdge' system helps fire accurately in darkness and low light conditions and also facilitates firing from standing, kneeling, hip as well as lying positions, officials of the company said.

It can be fitted with a pistol such as a Glock-17, Glock-19 or 9mm Browning for close combat or covert operations, they added. The system is mounted with high-resolution low light infrared camera, an infrared illumination, a red dot laser and tactical torch for all environments during the close combat. With 'ShootEdge', the pistol can be shoulder fired and can instantaneously swivelled left or right by 56 degrees while allowing the shooter to remain behind cover while observing the camera feed of the terrorist hiding in any position. "An ergonomic extension in the ShootEdge fires the pistol," Singh said, adding that "camera is zeroed with the pistol and the display monitor provides aiming for quick and accurate engagement".

The integrated camera gives a clear engagement range in excess of 50 metres and clear viewing range of 200 metres by day and 30 metres by night, the officials said. Since 1993, Zen technologies Limited designs develops and manufacturers state of art realistic combat training and counter-drone solutions for defence and security forces world wide.

<http://www.indiandefensenews.in/2022/05/j-k-cops-to-be-armed-with-corner-shot.html?m=1>



*Mon, 09 May 2022*

## **India-France ties: After PM Modi's visit, France ready to work on Make in India initiatives in space, Defence**

India and France agreed to work in close proximity in line with the Make in India initiatives to address challenges related to space issues, besides having deeper ties in climate change and defence-related matters, according to news agency ANI report. Additionally, building on a great tradition of over 60 years of technical and scientific space cooperation, and in order to address the contemporary challenges that have arisen in space, in particular maintaining secure access to space for all, India and France have agreed on setting up a bilateral strategic dialogue on space issues during Indian Prime Minister Narendra Modi's recent visit to France.

As per the joint statement from the meeting, "it will bring together experts from space and defence agencies, administration and specialised ecosystem to discuss security and economic challenges in outer space, the norms and principles applicable to space as well as unveil new areas of cooperation. The two sides agreed to hold the first dialogue this year at the earliest."

During the meeting between Modi and French President Emmanuel Macron, both sides welcomed the ongoing intense cooperation across all defence domains. Joint exercises (Shakti, Varuna, Pegase, Desert Knight, Garuda) illustrate efforts towards better integration and interoperability wherever possible. Meanwhile, maritime cooperation between India and France has reached new levels of trust and will continue through exercises, exchanges and joint endeavours throughout the Indian Ocean.

Notably, India and France underscored that the long-standing armament cooperation is testimony to the mutual trust between the two sides. The six Scorpene submarines built at MDL in Mumbai illustrate the level of transfer of technology from France to India, in line with the "Make in India" initiative. As seen in the timely delivery of the Rafale despite the pandemic, the two sides enjoy synergy in the field of defence. Taking forward this momentum, and based on their mutual trust, both sides agreed to find creative ways for France's deeper involvement in the "Atmanirbhar Bharat" (Self-reliant India) efforts in advanced defence technology, manufacturing and exports, including by encouraging increased industry to industry partnerships.

In an increasingly digitalised world, India and France have strengthened cooperation between their cyber security agencies. Based on a convergent outlook, they agree to join forces in promoting cyber norms and principles in order to counter cyber threats and agree to upgrade their bilateral cyber dialogue with a view to contributing to a peaceful, secure and open cyberspace.

<https://www.livemint.com/news/world/indiafrance-ties-after-pm-modi-s-visit-france-ready-to-work-on-make-in-india-initiatives-in-space-defence-11652080435388.html>

## THE TIMES OF INDIA

*Tue, 10 May 2022*

### **SIIC IIT-K signs MoU to nurture startups in Def**

The startup Incubation and Innovation Centre, IITKanpur (SIIC IIT-Kanpur) recently signed an MoU with Innovation Organisation (DIO) to nurture and support start ups and SMEs in the defence sector through its flagship programme iDEX Prime. To facilitate this partnership, the team at iDEX organised an awareness session on May 6 on the pool of funding opportunities available to the innovators developing solutions to serve the defence requirements. Dayanand, deputy program director, iDEX DIO, DoPP, MoD addressed the event, and group captain Pallav Haldekar, Indian Air Force joined the event virtually.

Notable dignitaries including from Hindustan Aeronautics Limited (HAL), SK Siddhartha and his team from Gliders India Limited (GIL), Kanpur took part in the event. Dayanand shared his aspirations to leverage significant innovation-driven changes in the Indian Defence Services through the iDEX Prime programme. He said, "iDEX was launched in 2018 with an agenda to cater to day-to-day requirements of the Border Services through technology solutions. The programme will foster product development for the Indian Military Services and expose innovators to the Defence infrastructure to achieve promising outcomes." iDEX Prime has launched a total of six problem statements along with 38 challenges under DISC 6 that have been gathered from the armed forces, coast guards, DPSUs, and ministry of home affairs. Some of these challenges are Scalable Wireless Communication Network for autonomous mobile

platforms, design of Active Hydro Pneumatic Suspensions with variable dampening characteristics to meet different road profiles, development of AI (Artificial Intelligence) enabled welder's helmet for realtime display of welding parameters like voltage, current, traverse speed, electrode stick out etc for immediate corrective control by welder during MIG & TIG welding processes, AI-Based Condition Monitoring System for yard assets.

processes, AI-Based Condition Monitoring System for yard assets. Dr Nikhil Agrawal, CEO-SIIC said, "I'm excited about this partnership with Defence Innovation Organisation under the iDEX Programme. India has consistently been a generous importer of defence equipment. iDEX will allow us to reverse this trend from importing to innovating technology within our own country and serving our military forces. I am glad about the participation we've received for this event and look forward for deep-tech solutions by our innovators."

<https://timesofindia.indiatimes.com/city/kanpur/siic-iit-k-signs-mou-to-nurture-startups-in-def/articleshow/91454156.cms>

## Science & Technology News



*Mon, 09 May 2022*

### **A Smarter way to develop new drugs using artificial intelligence**

A new artificial intelligence technique has been developed that only proposes candidate molecules that can actually be produced in a lab. Pharmaceutical companies are using artificial intelligence to streamline the process of discovering new medicines. Machine-learning models can propose new molecules that have specific properties which could fight certain diseases, accomplishing in minutes what might take humans months to achieve manually. But there's a major hurdle that holds these systems back: The models frequently suggest new molecular structures that are difficult or impossible to produce in a laboratory. If a chemist is unable to actually make the molecule, its disease-fighting properties can't be tested.

A new approach from MIT researchers constrains a machine-learning model so it only suggests molecular structures that can be synthesized. The method guarantees that molecules are composed of materials that can be purchased and that the chemical reactions that occur between those materials follow the laws of chemistry. When compared to other methods, their model proposed molecular structures that scored as high, if not higher, on popular evaluations while also being guaranteed to be synthesizable. Their system also takes less than one second to propose a synthetic pathway, while other methods that separately propose molecules and then evaluate their synthesizability can take several minutes. Those time savings add up in a search space with billions of potential molecules.



“This process reformulates how we ask these models to generate new molecular structures. Many of these models think about building new molecular structures atom by atom or bond by bond. Instead, we are building new molecules building block by building block and reaction by reaction,” says Connor Coley, the Henri Slezynger Career Development Assistant Professor in the MIT departments of Chemical Engineering and Electrical Engineering and Computer Science, and senior author of the paper. Joining Coley on the paper are first author Wenhao Gao, a graduate student, and Rocío Mercado, a postdoc. The research was presented recently at the International Conference on Learning Representations.

### **Building blocks**

To create a molecular structure, the model simulates the process of synthesizing a molecule to ensure it can be produced. The model is given a set of viable building blocks, which are chemicals that can be purchased, and a list of valid chemical reactions to work with. These chemical reaction templates are hand-made by experts. Controlling these inputs by only allowing certain chemicals or specific reactions enables the researchers to limit how large the search space can be for a new molecule. The model uses these inputs to build a tree by selecting building blocks and linking them through chemical reactions, one at a time, to build the final molecule. At each step, the molecule becomes more complex as additional chemicals and reactions are added.

It outputs both the final molecular structure and the tree of chemicals and reactions that would synthesize it. “Instead of directly designing the product molecule itself, we design an action sequence to obtain that molecule. This allows us to guarantee the quality of the structure,” Gao says. To train their model, the researchers input a complete molecular structure and a set of building blocks and chemical reactions, and the model learns to create a tree that synthesizes the molecule. After seeing hundreds of thousands of examples, the model learns to come up with these synthetic pathways on its own.

### **Molecule optimization**

The trained model can be used for optimization. Researchers define certain properties they want to achieve in a final molecule, given certain building blocks and chemical reaction templates, and the model proposes a synthesizable molecular structure. “What was surprising is what a large fraction of molecules you can actually reproduce with such a small template set. You don’t need that many building blocks to generate a large amount of available chemical space for the model to search,” says Mercado. They tested the model by evaluating how well it could reconstruct synthesizable molecules. It was able to reproduce 51 percent of these molecules, and took less than a second to recreate each one. Their technique is faster than some other methods because the model isn’t searching through all the options for each step in the tree. It has a defined set of chemicals and reactions to work with, Gao explains.

When they used their model to propose molecules with specific properties, their method suggested higher quality molecular structures that had stronger binding affinities than those from other methods. This means the molecules would be better able to attach to a protein and block a certain activity, like stopping a virus from replicating. For instance, when proposing a molecule that could dock with SARS-Cov-2, their model suggested several molecular structures that may be better able to bind with viral proteins than existing inhibitors. As the authors acknowledge, however, these are only computational predictions. “There are so many diseases to tackle,” Gao says. “I hope that our method can accelerate this process so we don’t have to screen billions of

molecules each time for a disease target. Instead, we can just specify the properties we want and it can accelerate the process of finding that drug candidate.”

Their model could also improve existing drug discovery pipelines. If a company has identified a particular molecule that has desired properties, but can't be produced, they could use this model to propose synthesizable molecules that closely resemble it, Mercado says.

Now that they have validated their approach, the team plans to continue improving the chemical reaction templates to further enhance the model's performance. With additional templates, they can run more tests on certain disease targets and, eventually, apply the model to the drug discovery process. “Ideally, we want algorithms that automatically design molecules and give us the synthesis tree at the same time, quickly,” says Marwin Segler, who leads a team working on machine learning for drug discovery at Microsoft Research Cambridge (UK), and was not involved with this work. “This elegant approach by Prof. Coley and team is a major step forward to tackle this problem. While there are earlier proof-of-concept works for molecule design via synthesis tree generation, this team really made it work. For the first time, they demonstrated excellent performance on a meaningful scale, so it can have practical impact in computer-aided molecular discovery.

The work is also very exciting because it could eventually enable a new paradigm for computer-aided synthesis planning. It will likely be a huge inspiration for future research in the field.” This research was supported, in part, by the U.S. Office of Naval Research and the Machine Learning for Pharmaceutical Discovery and Synthesis Consortium.

<https://scitechdaily.com/a-smarter-way-to-develop-new-drugs-using-artificial-intelligence/amp/>



*Tue, 10 May 2022*

## **Massive black hole might have spontaneously ‘flipped’ its magnetic field**

A rare outburst from a galaxy over 236 million light-years away could have been caused by a spontaneous flip of the magnetic field surrounding its central black hole, according to a study by an international research team. The team used UV and X-ray measurements from NASA's Neil Gehrels Swift Observatory and ESA's (European Space Agency) XMM-Newton satellite, along with visible light and radio observations from other sources. A research article documenting the findings has been accepted for publication in *The Astrophysical Journal*. In March 2018, the All-Sky Automated Survey for Supernovae alerted astronomers that a galaxy called 1ES 1927+654 had brightened by nearly 100 times in visible light. A further search showed that the eruption had begun months earlier, towards the end of 2017.

When NASA's Swift space observatory, which studies gamma-ray bursts, X-ray, UV and visible light, first examined the galaxy in May 2018, its UV emissions were elevated 12 times but kept steadily declining, indicating that there was an earlier unobserved peak. In June, the galaxy's higher-energy X-ray emission disappeared. Big galaxies often host supermassive black holes at their centre. When matter falls towards these black holes, it collects into a vast flattened structure

called the accretion disk. The material slowly spirals inwards, heats up and emits visible, UV and lower-energy X-ray light. A cloud of extremely hot particles near the black hole, called the corona, produces higher-energy X-rays. The brightness of these emissions from the black hole depends on how much material streams towards it.

“An earlier interpretation of the eruption suggested that it was triggered by a star that passed so close to the black hole it was torn apart, disrupting the flow of gas. We show that such an event would fade out more rapidly than this outburst,” said co-author Josefa Becerra González, of the Canary Islands Institute of Astrophysics, in a NASA press statement. The disappearance of the higher-energy X-ray emissions in this case gave astronomers an important clue: they suspect that the black hole’s magnetic field creates and sustains the corona—a cloud of extremely hot particles— so any magnetic change could impact its X-ray properties.

“A magnetic reversal, where the north pole becomes south and vice versa, seems to best fit the observations. The field initially weakens at the outskirts of the accretion disk, leading to greater heating and brightening in visible and UV light,” said co-author Mitchell Begelman, a professor in the department of astrophysical and planetary sciences at the University of Colorado Boulder in a press statement. Begelman and his colleagues at the University of Colorado developed the magnetic model. As the flip happens, the magnetic field becomes so weak that the black hole can no longer support the corona, leading to the X-ray emissions vanishing. Slowly, the magnetic field begins strengthening in its new orientation. In October 2018, about four months after they disappeared, the X-rays came back. This indicated that the corona has been fully restored. By the summer of 2021, the galaxy had completely returned to its pre-eruption state.

According to NASA, magnetic reversals are likely to be common events in the universe as geological records show that the Earth’s field flips unpredictable, reversing a few times every million years in the recent past. The Sun undergoes a magnetic reversal much more often as part of its normal cycle of activity. It switches its north and south poles roughly every 11 years.

<https://indianexpress.com/article/technology/science/a-supermassive-black-hole-might-have-spontaneously-flipped-its-magnetic-field-7907449/>

