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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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**DRDO News**

**DRDO Technology News**

**पंजाब केसरी**

*Thu, 15 Dec 2022*

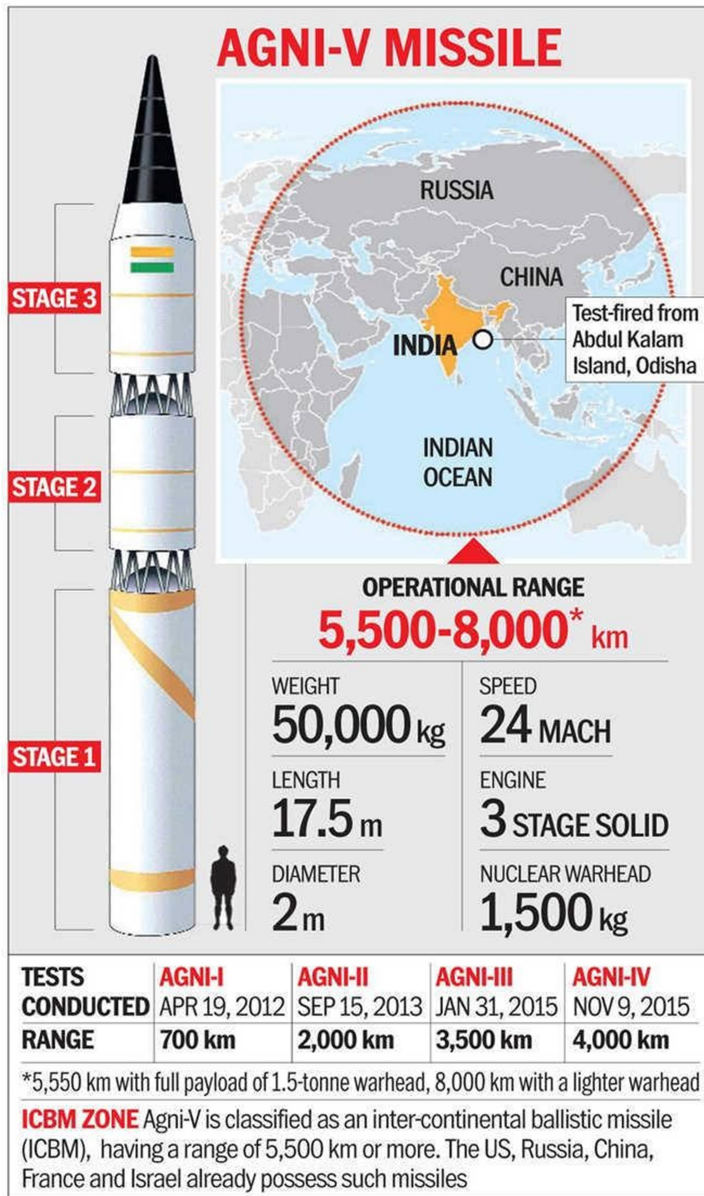
## **तवांग झड़प के बीच भारत का चीन को बड़ा संदेश, DRDO ने किया Agni-5 का सफल परीक्षण**

भारतीय रक्षा अनुसंधान (DRDO) ने गुरुवार को अग्नि-5 का सफल परीक्षण किया है। यह एक बैलेस्टिक मिसाइल है। अग्नि-5 की मारक क्षमता 5000 किमी से 6000 किमी तक है। यह मिसाइल चीन और पाकिस्तान समेत ईरान तक मार करने में सक्षम है।

अग्नि-5 मिसाइल का टेस्ट ऐसे समय पर किया गया है, जब कुछ दिन पहले ही एलएसी पर चीन और भारत के बीच एक बार फिर रिश्तों में तनाव बढ़ गया है। बता दें कि 9 दिसंबर को चीनी सेना PLA ने भारतीय सीमा में प्रवेश करने की कोशिश की लेकिन सीमा पर तैनात भारत के बहादुर जवानों ने उन्हें खदेड़ दिया।

इससे पहले हिंद महासागर में चीन का जासूसी जहाज वांग यांग-5 प्रवेश कर गया था। जिसकी वजह से मिसाइल का परीक्षण बीच में रोक दिया गया। एक दिन पहले ही नौसेना के सूत्रों ने बताया था कि चीन का जासूसी जहाज वांग यांग-5 हिंद महासागर से बाहर निकल गया है।

नौसेना के सूत्रों ने बताया था कि चीन के जासूसी जहाज पर कड़ी नजर रखी जा रही है। ये पहला मौका नहीं था जब चीन का जासूसी जहाज हिंद महासागर में प्रवेश किया हो। इससे पहले श्रीलंका के हंबनटोटा में भी चीन का एक जासूसी जहाज डॉक किया गया था। जिसके बाद कूटनीतिक मतभेद उभरकर सामने आए थे।



### अग्नि-5 मिसाइल की क्या हैं खासियत

- अग्नि 5 मिसाइल की वास्तविक रेंज 5000 से 8000 किमी
- पेलोड के साथ 5500 किमी तक मार करने में सक्षम
- मिसाइल का वजन 50 टन है
- अग्नि 5 की स्पीड 24 मेक है
- 17.5 मीटर लंबी है अग्नि 5 मिसाइल, व्यास 2 मीटर
- मिसाइल में तीन इंजन लगे हैं
- 1.5 टन न्युक्लियर वार हेड ले जाने में सक्षम

### कब कब हुए टेस्ट

अग्नि 1 मिसाइल का परीक्षण वर्ष 2012 में हुआ था। अग्नि 1 की रेंज 700 किमी तक थी। इसके बाद अग्नि 2 का सितंबर 2013 में परीक्षण हुआ। अग्नि 2 की मारक क्षमता 700 किमी से बढ़कर 2000 किमी तक हो गई। साल 2015 में अग्नि 3 की सफल परीक्षण हुआ और मारक क्षमता 3500

किमी तक बढ़ गई। अग्नि 4 का 9 नवंबर को सफल परीक्षण हुआ। अग्नि 4 की मारक क्षमता 4000 किमी तक पहुंच गई। अग्नि 3 और अग्नि 4 पाकिस्तान और चीन के कई हिस्सों तक मार करने में सक्षम थी। अग्नि 5 के परीक्षण के साथ ही भारत अमेरिका, रूस, चीन, फ्रांस और इजरायल की श्रेणी में शामिल हो गया है। इन देशों के पास ऐसी मिसाइल पहले से मौजूद हैं।

<https://www.punjabkesari.in/national/news/india-s-big-message-to-china-amid-tawang-clash-drdo-successfully-tests-agni-5-1734758>

## Agni V Test: दुश्मनों पर कहर बनकर गिरेगी ये मिसाइल, चीन के अंतिम कोने तक मचा सकती है तबाही

भारत आज अग्नि-5 बैलिस्टिक मिसाइल का टेस्ट करने वाला है। रक्षा क्षेत्र को बड़े पैमाने पर बढ़ावा देने के लिए भारत आज अग्नि-5 बैलिस्टिक मिसाइल का परीक्षण करने के लिए तैयार है। स्वदेशी रक्षा विशाल रक्षा अनुसंधान और विकास संगठन (DRDO) ने यह मिसाइल विकसित की है। इसका परीक्षण भारतीय सेना के सामरिक बल कमान द्वारा ओडिशा तट से दूर अब्दुल कलाम द्वीप से किया जाएगा। सूत्रों के अनुसार, परीक्षण से पहले अधिकारियों ने एक अधिसूचना जारी की है और बंगाल की खाड़ी को नो फ्लाई जोन घोषित कर दिया है।

ये परीक्षण 15-16 दिसंबर के बीच निर्धारित है और मिसाइल की मारक क्षमता 5,400 किलोमीटर है। भारत लंबे समय से अग्नि-5 के परीक्षण की योजना बना रहा है, क्योंकि यह भारत द्वारा विकसित मध्यम और लंबी दूरी की परमाणु-सक्षम बैलिस्टिक मिसाइलों की श्रृंखला में पांचवीं होगी। मिसाइल का पहली बार परीक्षण 2012 में किया गया था, इसके बाद के परीक्षण 2013, 2015, 2016, 2018 और 2021 में किए गए। इस मिसाइल में एक पनडुब्बी के माध्यम से लॉन्च करने की क्षमता भी है।

### चीन को कड़ा संदेश भेजने का फैसला

खास बात ये है कि ये टेस्ट तब हो रहा है जब भारतीय और चीनी सैनिक अरुणाचल प्रदेश के तवांग सेक्टर में आमने-सामने हो गए। चीनी सैनिकों के पीछे हटने के बाद भारत ने अब भारतीय वायुसेना के युद्ध अभ्यास और अब लंबे समय से प्रतीक्षित अग्नि-5 मिसाइल परीक्षण की शुरुआत करके अपनी तैयारियों का प्रदर्शन करते हुए चीन को एक कड़ा संदेश भेजने का फैसला किया है।

### अग्नि-5 मिसाइल का महत्व

रक्षा सूत्रों के अनुसार, अग्नि-5 मिसाइल का परीक्षण महत्वपूर्ण है, क्योंकि यह कई हथियारों को ले जाने में सक्षम एमआईआरवी से लैस हो सकती है। इसके महत्व को ध्यान में रखते हुए मिसाइल की एमआईआरवी क्षमता का मल्टी सैटेलाइट लॉन्च के दौरान गुप्त रूप से परीक्षण किया गया था और अब तक कोई लाइव लॉन्च नहीं किया गया है।

### बैलिस्टिक मिसाइल लॉन्चिंग पर बौखला रहा चीन

यहां यह भी ध्यान देना जरूरी है कि इस साल की शुरुआत में चीन ने 1998 में पारित संयुक्त राष्ट्र सुरक्षा परिषद (यूएनएससी) के एक प्रस्ताव का हवाला देते हुए भारत के मिसाइल कार्यक्रम पर सवाल उठाए थे। चीन के विदेश मंत्रालय के प्रवक्ता ने जोर देकर कहा था, "क्या भारत परमाणु हथियारों से लैस बैलिस्टिक मिसाइल विकसित कर सकता है, UNSCR 1172 में पहले से ही स्पष्ट शर्तें हैं। दक्षिण एशिया में शांति, सुरक्षा और स्थिरता बनाए रखना सभी के सामान्य हितों को पूरा करता है, जहां चीन को उम्मीद है कि सभी पक्ष रचनात्मक प्रयास करेंगे।"

बता दें कि अब तक भारत में अग्नि मिसाइल सिस्टम के कई मिसाइलें बनाई जा चुकी हैं। अग्नि मिसाइल के महत्वपूर्ण वर्जनों में अग्नि 1 जिसकी रेंज 700 किमी, अग्नि 2 रेंज- 2,000 किमी, अग्नि 3 रेंज- 3,000 किमी, अग्नि 4 रेंज- 4,000 किमी, अग्नि 5 रेंज- 5,000 किमी और उससे ज्यादा दूरी तक की मारक क्षमता है। गौरतलब है कि अग्नि मिसाइल स्वदेशी रूप से विकसित एक बैलिस्टिक मिसाइल है, जो कि परमाणु क्षमता से लैस है। यह बैलिस्टिक मिसाइल सतह से सतह पर मार करने में सक्षम है।

<https://bharat.republicworld.com/india-news/general-news/tawang-clash-india-test-agni-v-missile-major-boost-defense-sector>

## THE TIMES OF INDIA

*Thu, 15 Dec 2022*

### **Amid Border Row with China, India Conducts Night Trials of Nuclear-Capable Agni V Missile**

Amid fresh tensions with China along the Line of Actual Control (LAC) in Arunachal Pradesh, India on Thursday successfully carried out the night trials of Agni-V nuclear-capable ballistic missile off Odisha coast. The missile — considered India's most formidable — can hit targets well beyond the range of 5,000 kilometres.

It technically brings even the northernmost part of China within its strike envelope. The latest test was carried out to validate new technologies and equipment on the missile, which is now lighter than before, defence sources said.

The successful trial has proved the capability to enhance the range of the Agni-V missile, if required. There is no official word on the night trials of the missile, PTI reported.

The launch was carried out at approximately 5:30pm from APJ Abdul Kalam Island in Odisha.

The missile uses a three-stage solid-fuelled engine and has a very high degree of accuracy, according to the defence ministry.

TOI had earlier reported that Defence Research and Development Organisation (DRDO) is working to develop 'multiple independently targetable re-entry vehicles' (MIRVs) for the Agni missiles. An MIRV payload basically involves a single missile carrying four to six nuclear warheads, each programmed to hit a separate target. The existing single-warhead Agni-V in itself

adds teeth to the deterrence posture against China, which has missiles like the Dong Feng-41 (12,000-15,000-km) that can hit any Indian city.

Notably, the test, which was planned in advance, comes days after a major clash between Indian and Chinese troops in the Tawang sector of Arunachal Pradesh. Existing variant Agni IV is capable of hitting targets at a range of 4,000 km while Agni-III has a range of 3,000-km, and Agni II can fly up to 2,000-km. In June, India successfully carried out a night launch of the nuclear-capable Agni-4 ballistic missile, in a boost to India's military capabilities.

India has been steadily enhancing its overall military might in the last couple of years. It has carried out successful tests of a number of missiles during the period. In May, the extended range version of the BrahMos supersonic cruise missile was test-fired from a Sukhoi fighter jet. It was the first launch of the extended range version of the BrahMos missile from a Su-30MKI aircraft. An anti-ship version of the BrahMos supersonic cruise missile was successfully test-fired jointly by the Indian Navy and the Andaman and Nicobar Command in April.

<https://timesofindia.indiatimes.com/india/amid-border-row-with-china-india-conducts-night-trials-of-nuclear-capable-agni-v-missile/articleshow/96258114.cms>



*Thu, 15 Dec 2022*

## **Night Trials of Agni-V Ballistic Missile 'Successful'**

In pursuit to strengthen its nuclear deterrence India on Thursday successfully carried out the night trials of the Agni-V ballistic missile. As per the sources it has a range of over 5500 km. The missile developed by Defence Research and Development Organisation (DRDO), was tested at a defence facility from Abdul Kalam Island off the Odisha coast.

Sources said the test was carried out to validate new technologies and equipment on the missile which is now lighter than before. The trial has proved the capability to enhance the range of the Agni-5 missile if required, sources added. It was in October that India successfully test-fired the Agni-V missile.

"A successful launch of the Surface-to-Surface Ballistic Missile, Agni-5, was carried out on October 27, 2021, at approximately 1950 hrs from APJ Abdul Kalam Island, Odisha. The missile, which uses a three-stage solid-fuelled engine, is capable of striking targets at ranges up to 5,000 kilometres with a very high degree of accuracy," said the Ministry of Defence (MoD) in a statement. Broadly falling into the category of Inter-Continental Ballistic Missile category, it can carry a payload of 1.5 tonnes and weighs around 50 tonnes. India is the eighth country to have intercontinental ballistic missiles after the US, UK, Russia, China, France, Israel and North Korea. Agni series of missiles include from 1 to 5 and Agni -V, the most advanced of them was first tested in 2012. At present, in addition to the Agni-5, other Agni missiles that India has are: Agni-1 with a 700-km range, Agni-2 with a 2,000-km range, Agni-3 and Agni-4 with 2,500 km to more than 3,500 km range.

<https://www.newindianexpress.com/nation/2022/dec/15/night-trials-of-agni-v-ballistic-missile-successful-2528503.html>



## **Has the Range of Agni V Missile been Increased?**

*By Shishir Gupta*

While Prime Minister Narendra Modi was celebrating the victory of 1971 war at a reception hosted by Army Chief Gen Manoj Pandey, the Defence Research and Development Organization (DRDO) conducted the developmental trial for India's nuclear missile spearhead Agni-V from A.P.J. Abdul Kalam Island in Odisha. While Prime Minister Narendra Modi was celebrating the victory of 1971 war at a reception hosted by Army Chief Gen Manoj Pandey, the Defence Research and Development Organization (DRDO) conducted the developmental trial for India's nuclear missile spearhead Agni-V from A.P.J. Abdul Kalam Island in Odisha.

While Agni-V has the range to deter any Chinese misadventure with its capacity to strike in Han main land China beyond Buddhist Tibet and Sunni Muslim Xinjiang, the DRDO is awaiting a green signal from the Modi government to roll-out the 5000 km range K-submarine launched ballistic missile to complete the nuclear triad. India, however, is still in the initial stages to develop an anti-ship ballistic missile to counter any naval armada threatening its 7500 km shore line. While China has DF-21 anti-ship missiles to deter US carrier strike force from coming in defence of Taiwan and DF-26 to target US main base in Guam, the US has enough arsenal to neutralize the Chinese missile park on the eastern coast by using nuclear submarine launched missiles so that its super carriers can freely operate in South China Sea. For India, the anti-ship missile is work in progress, but the new Agni missile series is enough to deter any adversary.

<https://www.hindustantimes.com/india-news/has-the-range-of-agni-v-missile-been-increased-101671161753128.html>

### **Defence News**

### **Defence Strategic : National/International**



**Press Information Bureau  
Government of India**

**Ministry of Defence**

*Thu, 15 Dec 2022*

### **Indo Nepal Joint Training Exercise “Surya Kiran -XVI” to Commence at Nepal Army Battle School, Saljhandi (Nepal)**

The 16th Edition of Indo-Nepal joint training Exercise “SURYA KIRAN-XVI” between India and Nepal will be conducted at Nepal Army Battle School, Saljhandi (Nepal), from 16 - 29

December 2022. Exercise “SURYA KIRAN” is conducted annually between India and Nepal with the aim to enhance interoperability in jungle warfare & counter terrorism operations in mountainous terrain and HADR under UN mandate.

Nepal Army soldiers of Shree Bhawani Baksh Battalion and Indian Army soldiers from the 5 GR will be participating in the exercise. The two armies, through these contingents, shall be sharing the experiences gained during the conduct of various counter-insurgency operations over the years in their respective countries. The joint exercise would focus on evolution of combined drills for planning and conduct of tactical operations at unit level in counter terrorism operations and disaster response mechanism in general and role of armed forces in management of disaster.

During the exercise, participants will be training together to develop inter-operability and share their experience including Counter Insurgency and Counter Terrorist operations and also on Humanitarian Relief operations. The joint military exercise will enhance the level of defence cooperation which will further foster the bilateral relations between the two nations.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1883751>



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

**Ministry of Defence**

*Fri, 16 Dec 2022*

## **Curtain Raiser: Commissioning of Yard 12705 (Mormugao)**

Mormugao, a P15B stealth guided missile destroyer, is scheduled to be commissioned into the Indian Navy in the presence of the Hon’ble Raksha Mantri, Shri Rajnath Singh, at the Naval Dockyard, Mumbai on 18 Dec 22. The event marks the formal induction into the Navy of the second of the four ‘Visakhapatnam’ class destroyers, indigenously designed by the Indian Navy’s in-house organisation, Warship Design Bureau and constructed by Mazagon Dock Shipbuilders Limited, Mumbai.

The majestic ship measures 163m in length, 17 m in breadth with a displacement of 7400 tonnes and can rightfully be regarded as one of the most potent warships to have been constructed in India. The ship is propelled by four powerful Gas Turbines, in a Combined Gas and Gas (COGAG) configuration, capable of achieving speeds in excess of 30 knots. The ship has enhanced stealth features resulting in a reduced Radar Cross Section (RCS).

Mormugao is packed with sophisticated ‘state of the art’ weapons and sensors such as Surface to Surface Missile and Surface to Air Missiles. The ship is fitted with a modern Surveillance Radar which provides target data to the gunnery weapon systems of the ship. The ship’s Anti-Submarine Warfare capabilities are provided by the indigenously developed Rocket Launchers, Torpedo Launchers and the ASW helicopters. The ship is equipped to fight under Nuclear, Biological and Chemical (NBC) warfare conditions.

A unique feature of this ship is the high level of indigenisation of approximately 75% incorporated in the production, accentuating our national objective of ‘AatmaNirbhar Bharat’. Some of the major indigenised equipment / system onboard Mormugao include Surface to Surface and Surface to Air Missiles, Torpedo Tubes and Launchers, Anti-Submarine Rocket

Launchers, Super Rapid Gun Mount besides, Combat Management System, Integrated Platform Management System, Automated Power Management System, Foldable Hangar Doors, Helo Traversing system, Close-in Weapon System and Bow mounted SONAR. Major OEMs as well as small MSMEs such as BEL, L&T, Godrej, Marine Electrical Brahmos, Technico, Kineco, Jeet & Jeet, Sushma Marine, Techno Process, etc. have all contributed in making of the mighty Mormugao.

With a clear focus on indigenisation and self-reliance 42 out of the 44 ships and submarines under construction are being built in Indian Shipyards, thus further enhancing our efforts towards 'Aatmanirbhar Bharat'. In addition, AoN has been accorded for 55 ships and submarines which will all be constructed in Indian Shipyards.

Named after the historic port city of Goa on the West coast, Mormugao coincidentally undertook her first sea sortie on 19 Dec 21, when Goa celebrated 60 years of liberation from the Portuguese rule. Her commissioning now on 18 Dec 22 on the eve of the Goa Liberation Day will further augment the Indian Navy's mobility, reach and flexibility towards accomplishment of its role and tasks in the Indian Ocean and beyond.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1883994>

## THE TIMES OF INDIA

*Fri, 16 Dec 2022*

### **Air Drill & Agni-V Test: India Signals to China**

In two-pronged strategic signalling to China on Thursday, India tested its most formidable nuclear-capable missile Agni-V, even as the IAF kicked off an exercise with frontline fighters like Rafales and Sukhoi-30MKIs to fine-tune its combat readiness in the eastern sector.

The Strategic Forces Command (SFC) in collaboration with DRDO conducted the test of the over 5,000-km range Agni-V ballistic missile, which brings even the northernmost part of China within its strike envelope, from the APJ Abdul Kalam Island off the Odisha coast at 5.45 pm.

"The three-stage solid-fuelled Agni-V, in its full operational configuration, was successfully tested for its entire range. The missile incorporated some new technologies to make it lighter as well as enable it to go to a longer distance," a source told TOI.

The SFC had last tested the Agni-V in October 2021, which the defence ministry had then stated was in conformity with India's stated policy to have "credible minimum deterrence that underpins our commitment to no first-use".

The Agni-V is operationally better than earlier Agni variants because it is a canister-launch missile to ensure less maintenance as well as swifter transportation and firing. It provides India with stronger deterrence against China, which has a huge nuclear arsenal and missiles like the Dong Feng-41 (12,000-15,000-km) that can hit any Indian city. Earlier on Thursday, the Shillong-based Eastern Air Command launched the two-day consolidated air combat training exercise in Assam and Arunachal Pradesh, which also included C-130J 'Super Hercules' aircraft and drones, Apache attack and Chinook heavy-lift choppers. IAF said it was a "pre-planned exercise" and not connected to the major physical clash between Indian and Chinese soldiers at Yangtse in the Tawang sector of Arunachal Pradesh on December 9.

But it does come at a time when the People's Liberation Army-Air Force (PLAAF) has cranked up deployments of aircraft, helicopters and drones along the Line of Actual Control (LAC) across Arunachal Pradesh. Similar heightened air activity by PLAAF has been taking place across eastern Ladakh since mid-June, with Chinese fighters sometimes violating the 10-km no-fly zone confidence-building measure.

In the eastern sector, the IAF has also had to scramble Sukhoi fighters at least "two-three times over the last two-three weeks" as a precautionary air defence measure after "radar pick-ups" of Chinese aircraft near the LAC, as was reported by TOI. China has systematically upgraded all its major air-bases facing India like Hotan, Kashgar, Gargunsa and Shigatse with extended runways, hardened shelters and fuel storage facilities for additional fighters, bombers, drones and reconnaissance aircraft.

Apart from other measures, the IAF in turn based a squadron of its latest omni-role Rafale jets at the Hasimara air base in West Bengal, which is close to the Sikkim-Bhutan-Tibet tri-junction on the eastern front with China, from July 2021 onwards.

Though China has more than four times the number of fighters and bombers as compared to India, the high-altitude and rarefied air at its air-bases severely limits the weapon and fuel-carrying capacity of aircraft. IAF, with a distinct "terrain advantage", can deploy fully-loaded Rafale and Sukhoi fighters from bases like Hasimara, Tezpur and Chabua for strike missions across the frontier.

<https://timesofindia.indiatimes.com/india/air-drill-agni-v-test-india-signals-to-china/articleshow/96261947.cms>



Thu, 15 Dec 2022

## चीन से तनाव के बीच वायुसेना का युद्धाभ्यास, अरुणाचल में पहले दिन सुखोई फाइटर जेट ने भी भरी उड़ान

अरुणाचल प्रदेश से सटी एलएसी पर चीन से चल रहे विवाद और उत्तर-पूर्व के राज्यों में वायु सेना की एक्सरसाइज के बीच एबीपी न्यूज़ की टीम पहुंची असम के तेजपुर एयरबेस पर. अरुणाचल प्रदेश से सटी लाइन ऑफ कंट्रोल (LAC) पर अगर चीन की तरफ से एयर स्पेस का उल्लंघन होता है तो इसी तेजपुर एयर बेस से सुखोई लड़ाकू विमानों को स्कैम्बल किया जाता है.

एबीपी न्यूज़ की टीम गुरुवार (15 दिसंबर) की शाम तेजपुर एयरबेस पहुंची तो वहां हेलीकॉप्टर फ्लाइट की ड्रिल चल रही थी. एक के बाद एक चिनुक और दूसरे हेलीकॉप्टर तेजपुर के आसमान में नाइट फ्लाइट ऑपरेशन का अभ्यास कर रहे थे. जानकारी मिली कि दिन के वक्त सुखोई फाइटर जेट ने ड्रिल में हिस्सा लिया था.

## तेजपुर एकमात्र बेस जहां लड़ाकू विमान तैनात

असम और अरुणाचल प्रदेश में भारतीय वायुसेना का तेजपुर एक मात्र ऐसा बेस है, जहां लड़ाकू विमान तैनात हैं। इसके अलावा यहां हेलीकॉप्टर भी तैनात रहते हैं। साल 2017 में हुए डोकलाम विवाद के बाद जब चीन का J-20 फाइटर जेट अरुणाचल प्रदेश से सटे LAC के बेहद करीब आया था तो सुखोई ने उसे 'डिटेक्ट' कर लिया था।

इस खबर के बाद दुनियाभर में चीन की किरकिरी हुई थी, क्योंकि चीन का दावा था कि J-20 स्टील्थ फाइटर जेट है, जिसे दुनिया का कोई रडार या फिर विमान डिटेक्ट नहीं कर सकता है। इस घटना के बाद चीन ने अपने जे-20 के एवियोनिक्स से लेकर स्टील्थ फीचर में भी बदलाव किया था और लंबे समय तक जे-20 की कोई खबर सामने नहीं आई।

## दो दिवसीय युद्धाभ्यास कर रही है

तवांग में भारत और चीन की सेनाओं के बीच हुई झड़प के बीच भारतीय वायुसेना की पूर्वी कमान (15-16 दिसम्बर) दो दिवसीय युद्धाभ्यास कर रही है। ये एकसरसाइज असम और अरुणाचल प्रदेश सहित उत्तर-पूर्व के सभी राज्यों की एयर-स्पेस में की जा रही है। इसको लेकर वायुसेना ने नोटम (NOTAM) भी जारी कर रखा है। नोटिस टू एयरमैन (NOTAM) के मुताबिक, ये युद्धाभ्यास गुरुवार (15 दिसंबर) दोपहर 1.30 बजे से शुक्रवार (16 दिसंबर) शाम 5.30 तक चलेगा।

## हालिया घटनाओं से कोई लेना देना नहीं है

वायुसेना ने गुरुवार (15 दिसंबर) को एक संक्षिप्त बयान जारी कर कहा कि ये युद्धाभ्यास तवांग की घटना से पहले ही तय हो चुका था। इसका हालिया घटनाओं से कोई लेना-देना नहीं है। वायुसेना के मुताबिक, इसका उद्देश्य वायुसैनिकों की ट्रेनिंग है। भारतीय वायुसेना के पास इस वक्त अगर कोई सबसे ज्यादा फाइटर जेट हैं तो ये सुखोई ही हैं। वायुसेना के पास 250 से भी ज्यादा सुखोई विमान हैं। हाल ही में इन्हें और घातक बनाने के लिए ब्रह्मोस मिसाइल से भी लैस किया गया है। रूस के साथ एक विशेष करार के तहत इन सुखोई लड़ाकू विमानों का निर्माण भारत में ही होता है, जिन्हें SU-30 MKI कहा जाता है।

<https://www.abplive.com/news/india/arunachal-pradesh-tezpur-airbase-india-air-force-start-two-day-air-force-exercise-after-india-china-clash-ann-2283022>

# The Tribune

Thu, 15 Dec 2022

## Days after Border Clash, Indian Air Force Mega Exercise in NE

The (IAF) today started a two-day exercise over the eastern sector while specifying that it was a pre-planned drill and not a reaction to the recent confrontation with China on the border.

India had announced a NOTAM (notice to airmen) for a no-fly zone over the North-East for December 15-16. The IAF bases at Tezpur, Missamari, Chhabua, Jorhat in Assam and Hashimara and Bagdogra in West Bengal are participating in the mega exercise.

All IAF combat aircraft based in the eastern sector and other resources deployed in the region are involved in the exercise. These include fighter jets Rafale and Sukhoi-30MKI, besides helicopters Chinook, Apache and Mi-17, air borne early warning and control systems (AEW&CS) and unmanned aerial vehicles (UAVs). All forward airbases and advanced landing grounds (ALGs) of the IAF in the north-eastern region are also included in the exercise, which is being held for the purpose of “testing the combat capability of the IAF”.

Though the drill is taking place within days of the clash between the Indian Army and the People’s Liberation Army (PLA) of China at the LAC in Tawang, Arunachal Pradesh, IAF spokesperson Wing Commander Ashish Moghe said the exercise “was pre-planned”. Before the recent clash between India and China near Tawang, Chinese drones had moved very aggressively towards the Indian positions on the LAC.

<https://www.tribuneindia.com/news/nation/days-after-border-clash-iaf-mega-exercise-in-ne-461373>



Thu, 15 Dec 2022

## IAF Deploys Fighters and Other Assets in Annual Exercise in Eastern Command

Amidst the ongoing tensions along the Line of Actual Control in Arunachal Pradesh, Indian Air Force (IAF) is carrying out its annual exercise in the sector to test its war fighting capabilities as well tactics. This means that the IAF bases in the areas around Chhabua, Panagarh, Jorhat, Tezpur in Assam and Hashimara in West Bengal will all be activated from December 15-16 and all assets of the IAF will be used.

The two-day drill starting today is at the Command level and is planned by the eastern command to validate its operational capabilities in the sector and to validate its tactics in particular scenarios. There are two elements to the exercise which has started today and this includes

defence maneuvers — activating of air defence assets — and offensive as well. There will be different operations in scenarios and the early warning airborne aircraft will also be deployed.

Besides the front line fighter jets – Rafale which is stationed in Hashimara (West Bengal), and Su-30MKI, Chinook helicopters, transport aircraft as well as Unmanned Aerial Vehicles (UAVs) will also be participating in this drill.

For the exercise which is taking place in the eastern sector, India had already announced NOTAM (no-fly zone) over the North East from December 15-19.

### **IAF says ...**

On Thursday (Dec 15, 2022), the IAF has informed the media that this is a pre-planned routine exercise being conducted by the Eastern Command in its AOR from December 15-16.

According to the IAF, this exercise was planned well in advance and has nothing to do with the ongoing events in Tawang sector and is being conducted towards training the crew of IAF.

### **More about the exercise**

It was planned much before the clash between the Indian Army and Chinese PLA troops on December 9, 2022 and will confirm the operational readiness of IAF and how fast both offensive and defensive tactics come into play in a particular situation. There would not be one scenario but multiple scenarios will be played out.

### **China factor**

As far as the Chinese side is concerned they are already on alert and have already deployed their airborne early-warning aircraft at its Shigatse airport in view of the IAF exercise in the eastern sector.

IAF had to scramble their fighter jets once their air defence systems and radars had picked up Chinese air presence close to the LAC and in their air space.

### **Background**

Financial Express Online has reported earlier, following the Galwan incident in 2020, and to counter any Chinese threat, the IAF has remained in operational alert and has also carried out changes in its operational flight structures as well as changes in deployment.

And to counter the Chinese strategy of “Anti Access Area Denial (A2AD)”, IAF has now put in place an offensive and defensive deployment.

The Chinese has continued its belligerence throughout 2022, and in the past few months it has increased its air activity along the LAC. According to reports in August this year senior officers from the Air Forces of both countries had their maiden meeting to discuss this matter.

### **Is there an agreement in place?**

Yes. According to an agreement between the two countries – there is a limit for logistics helicopters up to one km and fighter jets or armed helicopters can come close to 10 kms.

<https://www.financialexpress.com/defence/iaf-deploys-fighters-and-other-assets-in-annual-exercise-in-eastern-command/2914309/>

Thu, 15 Dec 2022

## **‘Pack is Complete’ Tweets IAF, France Completes Delivery of 36 Rafales**

The last of the 36 Rafale fighter jets from the French Dassault Aviation have landed in India. As per the contract the French Company had to complete the deliveries by the end of 2022. Confirming this to Financial Express Online a senior Indian Air Force (IAF) officer said, “The 36th Rafale landed in India on the evening of December 14, 2022). This means that the French company has completed its deliveries of 36 fighters.”

FEET DRY!

'The Pack is Complete'

The last of the 36 IAF Rafales landed in India after a quick enroute sip from a UAE Air Force tanker.

Shukran jazeelan. @modgovae pic.twitter.com/5rkMikXQeS

— Indian Air Force (@IAF\_MCC) December 15, 2022

The IAF announced on social media that ‘The Pack is Complete’. It tweeted that the last of 36 IAF Rafales have landed in India after a quick en-route mid-air refueling from a UAE Air Force tanker aircraft. According to the IAF the last Rafale took off from France on its way to India and it was re-fuelled by the UAE Air Force.

The last aircraft which arrived in India was used for developing the India-specific enhancements which are for the fleet of the IAF. Financial Express Online has reported earlier that India signed a deal worth Rs 60,000 crore with the French Company Dassault Aviation for 36 ‘Rafales’ combat aircraft in 2016. Till July this year India had received 35 of these and they all are part of the IAF fleet and stationed at Ambala Air Force Station, and Hashimara in West Bengal.

The last aircraft which arrived is the same aircraft which has the initial ‘RB’ tail number. This aircraft has come with all its parts replaced as it was being used for development activities and the French side has also provided spares. It has already been reported that the IAF has started upgrading the fighters received earlier to the highest standards and now are being equipped with India-specific enhancements.

### **More about the aircraft**

IAF has now 35 Rafales in its fleet which is a 4.5-generation aircraft.

The aircraft which is equipped with long range air-to-air ground missiles, electronic warfare capabilities and advanced radars is helping the country regain its supremacy over the skies. The French company is involved in the maintenance of the aircraft. Its serviceability is over 75 per cent. It carries potent weapons including European MBDA’s long-range Meteor air-to-air



missiles as well as the Scalp air-to-ground missiles. It also carries a MICA weapon system. And to carry out precision attacks, the IAF has added the HAMMER missile to the Rafale's arsenal.

### **Background**

On July 29 2020, despite the global lockdown due to COVID pandemic, the French company delivered the first batch of five Rafale fighters.

### **More about 'RB'**

Financial Express Online has reported earlier that all the Rafales that are inducted in the IAF will come with their unique tail number. Each fighter aircraft and the trainer aircraft show a different set of alphabets as initials. It may be noted that when the company handed the first Rafale to India it had a tail number as 'RB 01'. This is the initials of the Air Chief RKS Bhadauria (now former Air Chief).

Why? Because the former Air Chief was the chief negotiator for the deal.

<https://www.financialexpress.com/defence/pack-is-complete-tweets-iaf-france-completes-delivery-of-36-rafales/2914438/>



*Thu, 15 Dec 2022*

## **India, Kazakhstan Start Joint Military Drill in Meghalaya**

The armies of India and Kazakhstan on Thursday began a fortnight-long joint exercise in Meghalaya, a senior defence officer said here. The sixth edition of 'Kazind-22', a joint training exercise aimed at enhancing the level of defence cooperation and fostering bilateral relations between the two nations, started at Umroi, 25 km from Shillong, and will conclude on December 28, he said.

"This joint exercise will enable the two armies to train, plan and execute a series of combined tactical drills for neutralising likely threats that may be encountered during UN peacekeeping operations," the Army officer told PTI.

The two countries instituted a joint annual training exercise in 2016 as 'Exercise Prabal Dostyk', which was later upgraded to a company-level exercise and renamed 'Exercise Kazind' in 2018.

The Kazakh soldiers were drawn from their South-based Regional Command while the 11 Gorkha Rifles will be participating in the exercise representing the Indian Army, the officer said.

As both armies will be participating in various combat games besides joint tactical planning and drills, it is expected that the exercise will improve military relations, imbibe each other's best practices and promote the ability to operate together while undertaking counter-terrorist operations in semi-urban or jungle scenarios under a UN peace enforcement mandate, he added.

<https://indianexpress.com/article/india/india-kazakhstan-start-joint-military-drill-meghalaya-8326957/>

## Indian Navy Chief Holds Discussions with Top Political and Defence Leadership in Lanka to Boost Bilateral Military Ties

Indian Navy chief Admiral R Hari Kumar has held discussions with senior political and defence leadership of Sri Lanka, including President Ranil Wickremesinghe, on furthering defence cooperation between the two nations. Kumar, who arrived here on Tuesday on a four-day visit, called on President Wickremesinghe on Wednesday.

“Discussions focused on furthering defence cooperation between India and Sri Lanka towards strengthening bilateral ties. Sri Lanka’s role in steering Colombo Security Conclave towards ensuring peace and security in the region was acknowledged,” the Indian High Commission here tweeted. He also called on Prime Minister Dinesh Gunawardena.

“Discussed the importance of strong defence ties between and means to further strengthen existing linkages between Armed Forces of the two countries,” the mission tweeted.

Kumar also met Premitha Bandara Tennakoon, State Minister of Defence of Sri Lanka, Chief of Defence Staff General Shavendra Silva and the chiefs of Sri Lankan Air Force and the Army, the Indian High Commission tweeted on Thursday. He also met with Vice Admiral Nishantha Ulugetenne, Commander of the Sri Lanka Navy.

Earlier, the Indian High Commission in a statement said that the visit of CNS symbolises strong relations and close cooperation between the two countries, with Sri Lanka being accorded the status of ‘Priority One’ partner by India. It would strengthen the existing bilateral maritime relations between the two countries and areas of common security concern and enhancing capacity and capability building initiatives towards ensuring peace in the region would be discussed during the visit, it said. The visit is also indicative of the growing camaraderie and friendship between the two nations in line with India’s ‘Neighbourhood First’ policy. High Commissioner Gopal Baglay along with the Navy chief hosted a reception on board the INS Sahayadri.

Sri Lankan Parliament Speaker Mahinda Yapa Abeywardena and ministers, including Nimal Siripala Silva, Douglas Devananda and Kanchana Wijesekera, several dignitaries and friends of India attended the reception. “Truly a memorable evening on board!!!,” the Indian mission tweeted.

Kumar also visited Sri Lanka Navy Ship SLNS Sindurala and Naval facilities at the Colombo Port.

“During interactions, the @srilanka\_navy leadership & the ship’s crew acknowledged the operational utility of the OPVs, built by @goashipyardltd for the Sri Lanka Navy,” the mission said.

Remembering the supreme sacrifice of brave Indian soldiers, Admiral Kumar paid his tributes at the IPKF Memorial on Tuesday. Indian Peace Keeping Force (IPKF) was the Indian military contingent performing a peacekeeping operation in Sri Lanka between 1987 and 1990. Kumar

has been invited as the Chief Guest and Reviewing Officer for the Commissioning Parade at the Naval and Maritime Academy (NMA), Trincomalee, scheduled on Thursday. Admiral Kumar's visit comes months after the docking of a Chinese spy ship at Sri Lanka's Hambantota port triggered a diplomatic row between New Delhi and Colombo.

<https://theprint.in/world/indian-navy-chief-holds-discussions-with-top-political-and-defence-leadership-in-lanka-to-boost-bilateral-military-ties/1267002>

## THE ECONOMIC TIMES

*Thu, 15 Dec 2022*

### **Five Components Being Made in Dassault-Reliance's Nagpur Plant to be Integrated with All Rafale Jets**

Five Rafale parts being manufactured in the Dassault Reliance Aerospace plant in Nagpur are sent to France to get fitted in all the Rafale jets, not just the Indian ones. Consul General of France in Mumbai Jean-Marc Sere-Charlet and a delegation of the regional economic service of the embassy visited the two French companies Dassault Reliance Aerospace Limited (DRAL) and Air Liquide present in Nagpur.

Speaking with PTI during his visit, Sere-Charlet said the visit aims to further enhance the close cooperation between France and India in many areas -- ranging from trade and investments, defence and security, energy, education, and French language teaching to civil society. He also said that Agence Francaise Development (AFD) public development bank had contributed 130 million euros in funding for 20 years. To a query on the manufacturing status of Rafale and Falcon 2000 in the DRAL manufacturing plant, the Consul General said that 5 pieces of Rafale are manufactured in Nagpur and then sent to the France assembly line to be assembled in all the Rafale jets, not just the Indian ones.

He also said that as regards to the manufacturing of Falcon 2000 jets, DRAL is making different segments of Falcon 2000 jets and they are sent to France to be integrated with the assembly line. AFD is very happy with the work it did in Nagpur metro phase 1 and it is active in other metro projects in Pune and Gujarat, he added.

On whether AFD will be funding the second phase of Nagpur Metro, he informed that it was up to the Maharashtra Metro Rail Corporation to decide with whom they want to partner. But, France and AFD are always interested in developing urban mobility with low carbon impact projects. The Consul General has also held a meeting with Nagpur Municipal Commissioner Radhakrishnan B.

<https://economictimes.indiatimes.com/news/defence/five-components-being-made-in-dassault-reliances-nagpur-plant-to-be-integrated-with-all-rafale-jets/articleshow/96250505.cms>

## **NDAA Seeks Strong Defence Ties with India; Funds Billions to Counter Challenges Posed by China**

The USD 858 billion defence bill passed by the US Senate seeks to strengthen defence ties with India, including supporting efforts to reduce India's reliance on Russian-built military equipment and funds billions of dollars to take measures to address the challenges posed to America's national security by China.

The National Defence Authorisation Act, known as the NDAA, was approved by the Senate with 83-11 votes on Thursday. The bill was passed by the House of Representatives with 350-80 votes on December 8. Now it heads to the White House for President Joe Biden to sign it into law.

As passed by the House and the Senate, the NDAA seeks to strengthen US-India relations by directing the Departments of Defence and State to pursue greater engagement and expanded cooperation with India related to emerging technology, joint Research and development, defence and cyber capabilities, and other opportunities for collaboration - including for reducing India's reliance on Russian-built defence equipment. These provisions support an effort by Senator Mark Warner, co-Chair of the Senate India Caucus, to highlight the importance of America's defence partnership with India, and to support accelerated efforts by India to diversify defence systems. Senate Armed Services Committee Chairman Jack Reed said that the NDAA strengthens key alliances and partnerships to bolster America's security.

"This year's NDAA includes targeted investments, needed reforms, and enhanced oversight. It addresses a broad range of pressing issues, from the strategic competition with China and Russia, to disruptive technologies like hypersonic, AI, and quantum computing, to modernising our ships, aircraft, and other equipment," he said.

According to Section 1260 of the NDAA, among the new areas of expanded defence cooperation with India need to include intelligence collection capabilities, unmanned aerial vehicles, fourth and fifth-generation aircraft, depot-level maintenance, fifth-generation wireless communication, open Radio Access Network technologies, defensive cyber capabilities, cold-weather capabilities and critical and emerging technologies.

Within 180 days of the passage of the bill, the NDAA urged the Defence Secretary to provide a report to Congress on the discussion of opportunities and challenges related to reducing India's reliance on Russian-built weapons and defence systems.

In October 2018, India signed a USD 5 billion deal with Russia to buy five units of the S-400 Triumf air defence missile systems to ramp up its air defence, despite a warning from the then Trump administration that going ahead with the contract may invite US sanctions. The US has repeatedly said it discourages India to rely on Russia for its defence needs.

Senator Jim Risch, a ranking member of the Senate Foreign Relations Committee, said the passage of the FY2023 NDAA brings one step closer to providing Taiwan with the security authorities and collaborative US-Taiwan defence relationship it needs to effectively deter, and if necessary, defeat, Chinese aggression.

The bill funds billions of dollars to take measures to address the challenges posed to America's national security by China. Senate Republican Leader Mitch McConnell said the NDAA steps up US investments in capabilities that are especially crucial to operations in the Indo-Pacific, from space assets to naval mines. The Indo-Pacific is a biogeographic region, comprising the Indian Ocean and the western and central Pacific Ocean, including the South China Sea.

The US, India and several other world powers have been talking about the need to ensure a free, open and thriving Indo-Pacific in the backdrop of China's rising military manoeuvring in the resource-rich region. China claims nearly all of the disputed South China Sea, though Taiwan, the Philippines, Brunei, Malaysia and Vietnam all claim parts of it. Beijing has built artificial islands and military installations in the South China Sea. China also has territorial disputes with Japan in the East China Sea. "It re-prioritises countering China's nuclear breakout by curbing the Biden administration's naive efforts to retire critical elements of our nuclear arsenal," McConnell said. "It tightens security on our cutting-edge research and bolsters sea-launch strategic deterrent capabilities," he added.

McConnell said this strong bipartisan bill puts new weight behind America's long-term commitments to stand with both vulnerable countries in China's orbit and vulnerable people within its own borders. "It will authorise a new Joint Force Headquarters right there in the region, and make sure that US military installations are not commercial destinations for goods that have been produced with Uyghur slave labour in the Xinjiang province," he said.

"This bill will also help stiffen the spine of the liberal entertainment industry that apparently lacks the courage to cross Beijing without clearer incentives," McConnell said. "This year's NDAA will prohibit the use of US military assets - like ships, or bases - in movies where the producers then turn around and allow Chinese censors to have final sign-off. If Hollywood wants to trample on American principles of free expression in order to please the Communist Party of China (CCP), they won't get to use our own Armed Forces as props in the process," he said.

"Of course, stepping up our competition with China and limiting the risks to America from the CCP does not mean walking away from the world stage more broadly. Quite the contrary. Checking the CCP will take a coordinated effort with even stronger, deeper ties between the United States and our like-minded friends and partners," McConnell said.

China, he alleged, is actively trying to undercut American interests and partnerships everywhere from Asia itself, to the Middle East, to Africa, and beyond. "This NDAA will strengthen our hand. It prioritises crucial partnerships in the Indo-Pacific," he said.

<https://economictimes.indiatimes.com/news/defence/ndaa-seeks-strong-defence-ties-with-india-funds-billions-to-counter-challenges-posed-by-china/articleshow/96269206.cms>

## खाड़ी के देशों में चीन का प्रभाव बढ़ता रहा तो भारत को भी इसका खामियाजा भुगतना पड़ सकता है पश्चिम एशिया में भी अमेरिका से भिडा चीन



हर्ष वी. पंत

यह ग्लोबल ऑर्डर में बड़े बदलावों का साल रहा है। यूक्रेन वॉर के बाद दुनिया की बड़ी शक्तियों में पोलराइजेशन बढ़ा। अमेरिका और चीन के मुकाबले ने भी इस साल नया रूप लिया। हमने देखा कि चीन को लेकर अमेरिका किस तरह से सीरियस हुआ है। वाइडन सरकार ने अपनी आर्थिक नीतियों को बदला है। सेमिकंडक्टर्स और आधुनिक तकनीक चीन तक ना पहुंचे, उसके लिए कानून बनाए हैं। दूसरी ओर साल के आखिर में चीन की विदेश नीति तब एक नया मोड़ लेती दिखी, जब शी चिनफिंग ने पश्चिम एशिया (मिडल ईस्ट) का दौरा किया।

### कैसे आया मोड़

पश्चिम एशिया में दशकों से अमेरिका ही सबसे बड़ी शक्ति के रूप में मौजूद रहा है। फिर यह मोड़ आया कैसे, आइए समझते हैं।

- द्वितीय विश्व युद्ध के बाद से अमेरिका पश्चिम एशियाई देशों के सबसे इंपॉर्टेंट सिक्योरिटी गारंटर के रूप में रहा है। खासकर सऊदी अरब ने अमेरिका के साथ सुरक्षा को लेकर संबंध बनाया तो अमेरिका की सुरक्षा नीति में भी सऊदी अरब और उसकी ऑयल एंड एनर्जी इंडस्ट्री का प्रमुख स्थान बना रहा।
- अब सऊदी अरब की विदेश नीति थोड़ी बदलती नजर आ रही है। वहां के क्राउन प्रिंस मोहम्मद बिन सलमान और अमेरिका के बीच तनाव बढ़ता ही रहा है।
- अपने चुनावी कैम्पेन में खुद वाइडन ने क्राउन

वाइडन की सऊदी अरब यात्रा भी बहुत सफल नहीं रही। सऊदी अरब के साथ मतभेदों को पूरी तरह सुलझाने में अमेरिका को अभी तक सफलता नहीं मिली है।

### घटता अमेरिकी दबदबा

इसीलिए चीन की नई पहल बेहद अहम है। हिंद-प्रशांत में चीन काफी अलग-थलग पड़ गया है। पश्चिमी देशों के साथ भी चीन के संबंध इस समय बहुत सार्थक नहीं दिख रहे। ऐसे में चीन के राष्ट्रपति का पश्चिम एशिया जाना संकेत दे रहा है कि वह वहां अमेरिका को चुनौती देने के लिए तैयार हैं। हालांकि सऊदी अरब और चीन के संबंध काफी सालों से धीरे-धीरे बढ़ रहे थे, लेकिन शी की हालिया यात्रा ने उसे एक तरह से अंतिम रूप दे दिया। इस रिश्ते के अभी के मोड़ तक पहुंचने की और भी इसकी कई वजहें हैं।

- इसमें सऊदी अरब की ओर से सबसे बड़ा कारण है यह है कि क्राउन प्रिंस मोहम्मद बिन सलमान अपने देश को डायवर्सिफाई करना चाहते हैं। उन्हें लगता है कि अगले कुछ दशकों में दुनिया की कच्चे तेल और गैस पर उतनी अधिक निर्भरता नहीं रह जाएगी। इसलिए जियो पॉलिटिक्स में बड़ा बदलाव आएगा।
- अमेरिका खुद ही एक बहुत बड़ा एनर्जी एक्सपोर्टर बनता जा रहा है, तो उसकी पश्चिम एशिया और सऊदी अरब पर निर्भरता कम होती जाएगी। इसीलिए अमेरिका के इस क्षेत्र में जो हित हैं, वे उतने प्रबल नहीं रहेंगे, जितने पिछले कई दशकों से रहे हैं।
- वहीं सऊदी अरब खुद को मॉडर्नाइज करने की कोशिश कर रहा है। वहां पर सर्विस सेक्टर को डिवेलप करने की कोशिश है। उन्होंने

Contd...

हिंद-प्रशांत में चीन अलग-थलग है। शी का पश्चिम एशिया जाना संकेत है कि वहां पर वह अमेरिका को चुनौती देने के लिए तैयार है

ताकि वे भी कुछ लिमिट के अंदर वर्कफोर्स में आ सकती हैं, सोशियो-इकॉनमिक एक्टिविटी में हिस्सा ले सकती हैं।

- दुबई या अबू धाबी से कंपीट करने के लिए नियोग जैसे कई शहर बनाने की कोशिश कर रहे हैं। ऐसे मॉडर्न शहर, जहां पर तकनीक हो।
- ऐसे में सऊदी अरब को लग रहा है कि उसे अमेरिका से हटकर दूसरे देशों की तरफ, खासकर उन देशों की तरफ जिनके पास कैपिटल है, जाना पड़ेगा। चूंकि चीन एक बड़ी आर्थिक शक्ति है, तो स्वाभाविक ही सऊदी अरब उसके साथ संबंध बढ़ा रहा है।
- समिट के दौरान शी चिनफिंग ने कहा कि चीन ऑयल इंपोर्ट करता रहेगा और नैचरल गैस इंपोर्ट भी बढ़ाएगा। इस तरह से चीन ने खाड़ी के देशों और सऊदी अरब को यह आश्वासन दिया है कि वह लॉन्ग टर्म स्ट्रैटिजी के तहत उनके साथ अपना व्यापार खासकर एनर्जी ट्रेड बढ़ाता रहेगा और इन्वेस्ट भी करेगा। सऊदी अरब की ऑयल कंपनी अरामको चीनी कंपनियों के साल सऊदी अरब की इस कंपनी में बहुत बड़ा इन्वेस्टमेंट किया है।

- दोनों ही देश चाहते हैं कि अंदरूनी मामलों में कोई हस्तक्षेप न करे। अमेरिका की दखलंदाजी दोनों को पसंद नहीं है। इसके चलते हम सऊदी अरब और चीन में एक पॉलिटिकल कन्वर्जन भी देख रहे हैं।

हालांकि अभी यह नहीं कहा जा सकता कि पश्चिम एशिया में अमेरिका का असर कम होगा, क्योंकि उसके अभी भी यूएई, सऊदी अरब और इस्त्राइल के साथ गहरे संबंध हैं। सिक्कारिटी इश्यूज में भी उनकी अमेरिका के ऊपर बहुत ज्यादा निर्भरता है। लेकिन चीन ने इस विजिट के बाद एक बार फिर वता दिया है कि अमेरिका को चैलेंज करने के लिए वह पश्चिम एशिया में तैयार खड़ा है।

### भारत क्या करे

चीन का यह कदम भारत के लिए भी बड़ा महत्वपूर्ण है, क्योंकि पिछले कुछ सालों से पश्चिम एशिया के देशों के साथ भारत के संबंध व्यापक हुए हैं। हमने देखा कि जब कश्मीर से आर्टिकल 370 को हटाया गया तो सऊदी अरब या यूएई की ओर से कोई खास प्रतिक्रिया नहीं हुई। दोनों ही देश भारत के साथ बहुत ही कोऑपरेटिव तरीके से आगे बढ़ रहे हैं। सऊदी अरब भारत में भी निवेश कर रहा है। भारत भी खाड़ी देशों से काफी तेल और गैस खरीदता है। भारत के लिए अच्छी बात यह है कि अमेरिका के साथ उसके अच्छे संबंध हैं। पश्चिम एशिया में जो बदलाव हो रहे हैं, उससे भी वह जुड़ा हुआ है। वह इस्त्राइल, यूएई और यूएस के आई2यू2 प्लैटफॉर्म में है। भारत का रोल पश्चिम एशिया में बढ़ता जा रहा है, लेकिन अगर चीन का प्रभाव ऐसे ही वहां बढ़ता रहा तो भारत की मुश्किलें बढ़ सकती हैं।

## **UK Defence Chief Says, Russia Faces ‘critical Shortage’ of Artillery Shells**

According to the UK defence chief, Russia has been facing a “critical shortage” of artillery shells and as a result, Moscow’s ability to conduct ground operations in Ukraine has been “rapidly diminishing”. The UK defence chief, Adm Sir Tony Radakin addressed an audience at the Royal United Services Institute (RUSI) think tank on Wednesday that Moscow had only planned for a short period to subjugate Ukraine but instead found itself embroiled in a conflict that has lasted nearly 10 months, reported the Guardian.

While talking about the Russia Ukraine war at RUSI think tank, the UK defence chief, Adm Sir Tony Radakin said, “So, let me tell Putin tonight what his own generals and ministers are probably afraid to say, “Russia faces a critical shortage of artillery munitions. This means that their ability to conduct successful offensive ground operations is rapidly diminishing.” Further, he added that there is no mystery that Russia's President, Putin had planned for a thirty-day war which has now reached 300 days (approx) of continuous firing.

While talking about the current status of the Russian arms and ammunition, the UK chief defence said, "The cupboard is bare. Morally, conceptually and physically, Putin’s forces are running low," reported The Guardian.

### **Moscow did not plan for Russia Ukraine war**

Similar statements about the stockpiles of Russia have been released by the western and Ukrainian leaders and officials who have been keeping a count of missiles fired against the known stockpiles and some say that Russia has been producing fresh ammunition as the Russia Ukraine war continues, reported The Guardian.

Earlier this month, a senior adviser to the Ukrainian president, Mykhailo Podolyak said that he had believe Moscow had enough cruise missiles for “two or three” more mass strikes against Ukraine, and its first batch of Geran-2 (Russian-modified Iranian drone) has been running out.

Last week the Ukrainian president, Volodymyr Zelenskyy, said half the energy network had been destroyed by continuous missile attacks that began on October 10 and have stretched the grid to its limit. Russia has begun the war with nine hundred Iskander missiles and was down to 119 at the end of November after using 829 and producing 48 despite economic sanctions, estimated by Ukraine, as per the blog posted on visit Ukraine today.

<https://www.republicworld.com/world-news/russia-ukraine-crisis/uk-defence-chief-says-russia-faces-critical-shortage-of-artillery-shells-articleshow.html>



*Thu, 15 Dec 2022*

## **The Global Supply Trail that Leads to Russia's Killer Drones**

The hundreds of Russian drones hovering ominously over the Ukrainian battlefield owe their existence to an elastic, sanctions-evading supply chain that often runs through a shabby office above a Hong Kong marketplace, and sometimes through a yellow stucco home in suburban Florida. The "Sea Eagle" Orlan 10 UAV is a deceptive, relatively low-tech and cheap killer that has directed many of the up to 20,000 artillery shells that Russia has fired daily on Ukrainian positions in 2022, killing up to 100 soldiers per day, according to Ukrainian commanders.

An investigation by Reuters and iStories, a Russian media outlet, in collaboration with the Royal United Services Institute, a defence think tank in London, has uncovered a logistical trail that spans the globe and ends at the Orlan's production line, the Special Technology Centre in St. Petersburg, Russia.

Based on Russian customs filings and bank records, the investigation marks the first time a supply route for American technology has been traced all the way to a Russian manufacturer, whose weapon system is used in Ukraine.

The Special Technology Centre, which once made a variety of surveillance gadgets for the Russian government and now focuses on drones for the military, was first targeted by U.S. sanctions after President Barack Obama said it had worked with Russian military intelligence to try to influence the 2016 U.S. presidential election.

The sanctions, which took effect in 2017, barred any American citizen or resident or U.S. company from supplying anything that might end up with the Special Technology Centre. In March of this year, the U.S. government tightened those restrictions by blocking all sales of any American products for any military end user, and effectively blocked all sales to Russia of high-technology items like microchips, communications and navigation equipment. None of that has stopped the production of the Orlan drone. The Special Technology Centre did not respond to a written request for comment. But one top scientist, who is also a major shareholder, said in an interview with Reuters that the company was experiencing a "high demand" for its drones. Russia's Ministry of Defence did not respond to questions from Reuters about the impact of sanctions and its relationship to the Special Technology Centre. The U.S. Department of Commerce, which enforces controls on the export of US technology, would not comment on its knowledge of the Special Technology Centre, or of U.S. parts supplying Russia's drone program. In a statement to Reuters, a Commerce spokesperson said the department cannot comment on the existence or non-existence of investigations. The spokesperson added: "We will not hesitate to use all the tools at our disposal to obstruct the efforts of those who seek to support Putin's war machine."

Among the most important suppliers to Russia's drone program has been a Hong Kong-based exporter, Asia Pacific Links Ltd, which, according to Russian customs and financial records, provided millions of dollars in parts, though never directly. Many of the parts are microchips

from U.S. manufacturers. Asia Pacific's exports to Russia were primarily delivered to one importer in St. Petersburg with close ties to the Special Technology Centre, those customs records show. The import company, SMT iLogic, shares an address with the drone maker and has numerous other connections. Asia Pacific's owner, Anton Trofimov, is an expatriate Russian who graduated from a Chinese university and has other business interests in China as well as a company in Toronto, Canada, according to his LinkedIn profile and other corporate filings.

According to public records, Trofimov is a resident of a modest East York neighborhood of Toronto. He did not respond to questions sent by email and LinkedIn. A woman who answered the door identified herself as Trofimov's wife and said she would pass along a message for him to contact Reuters. He never did. The neighborhood is a world away from Asia Pacific's office in a shabby and narrow office building off a side alley and pedestrian market in Hong Kong's business district. No one was at the Hong Kong office when a Reuters journalist visited recently. The company shares a partitioned room with three other tenants, according to the building's receptionist.

Despite appearances, business has boomed this year. In the seven months between March 1 and September 30, since Russia's February invasion, Asia Pacific increased its business sharply, exporting parts valued at about \$5.2 million, up from about \$2.3 million in the same period of 2021, making it iLogic's biggest supplier, according to Russian customs records. Many of the components were made by U.S. tech firms, the records also show.

Among the parts sent by Asia Pacific to iLogic in the same period of 2022 were \$1.8 million of chips made by Analog Devices (ADI.O), \$641,000 made by Texas Instruments (TXN.O), and \$238,000 by Xilinx, according to the Russian customs data. The supplies also included model aircraft engines made by a Japanese company, Saito Seisakusho, that are used in the Orlan 10, as shown in photos of drones recovered in Ukraine. Saito said it was unaware of the shipments.

Asked about the shipments to Russia in recent months, Analog Devices didn't reply to emailed questions. Texas Instruments and AMD (AMD.O), the owner of Xilinx, said their companies had not directly shipped or approved shipments into Russia for many months and were complying with all U.S. sanctions and export controls.

AMD added that it requires its authorized distributors to implement end-use screening measures to track the potential sale or diversion of AMD products into Russia or restricted regions. "SMT iLogic and Asia Pacific Links are not authorized AMD distributors," AMD said.

### **The Supplier Next Door**

Financial records provided by a Russian official and reviewed by Reuters show the Special Technology Centre relies on a number of suppliers, but most notably iLogic. According to a record of iLogic's own bank receipts and payments seen by Reuters, iLogic works almost exclusively for the drone maker.

Since 2017, iLogic has imported about \$70 million of mostly electronic products into Russia, according to customs records. And according to financial documents examined by iStories and Reuters, nearly 80% of the company's income is from its business with the Special Technology Centre.

In turn, those same financial records show the Special Technology Centre's biggest customer is Russia's Ministry of Defence, which paid it nearly 6 billion rubles (\$99 million) between

February and August of this year. The examined records list all transfers to and from the company's bank accounts during that period.

Reached by phone, Alexey Terentyev, a top scientist and major shareholder at the Special Technology Centre, said the war has forced it to focus on making drones. "Due to the high demand for Orlans, we do not have the resources to do something else now. The demand for it is much bigger than we can produce," he said. U.S. sanctions had caused the company problems, he said, but it always found someone in the world to sell it what it needed. "Sanctions were imposed on us by one of the most powerful countries in the world," Terentyev said. "We should be proud of this." Terentyev declined to say if iLogic was one of those suppliers. Asked about iLogic, he said, "You ask me about a company I don't know." Reminded that he was listed as one of iLogic's founders in Russian corporate records, he said that if his name showed up in documents, it was "likely correct" he was a shareholder. "Yes, I remember something," he said. But he could not recall what iLogic did. "I have lost connection with this company," he said.

Those corporate records show iLogic is based at the same St Petersburg office address as the Special Technology Centre. Russian corporate records show it was founded by Terentyev and other senior executives of the drone maker or their relatives. In a brief telephone interview, Roman Agafonnikov, chief executive officer of the Special Technology Centre, said he didn't know anything about iLogic.

### **Florida**

On the coast of southeast Florida, living in a smart suburban house just behind a nature reserve, is another individual who has supplied Russia's drone program. Igor Kazhdan, a 41-year-old U.S.-Russian citizen, owns a company, IK Tech, that sold about \$2.2 million worth of electronics to Russia between 2018 and 2021, Russian customs records show, over 90% of which were sold to iLogic. Russian custom records show that IK Tech sold iLogic about 1,000 American-made circuit boards between October 2020 and October 2021, at a time when federal law banned the supply, whether directly or via another company, of any such technology to the Special Technology Centre.

The boards, valued at about \$274,000, were made by a California manufacturer, Gumstix. The California company told Reuters it is "very concerned" to hear of the shipments and would investigate. It said it does not have customers located in Russia nor any products or services intended for Russia, adding, "We will take all appropriate action to address any identified diversion of products from lawful end use."

Photos taken by Ukraine officials of the inside of a captured drone and seen by Reuters show a Gumstix board that is almost identical to the boards shipped by IK Tech. According to a list of components found on another drone supplied to RUSI and Reuters by the Ukrainian government, the board is part of the Orlan 10's control unit.

Kazhdan's activities drew the attention of U.S. authorities. Just two weeks before Russian tanks rolled into Ukraine and Orlan drones started buzzing overhead, federal agents arrested Kazhdan. He was later indicted on 13 counts of smuggling and evading export controls when selling electronic components to Russia between December 2021 and February 2022.

The indictment related to selling sophisticated amplifiers made by U.S.-based Qorvo that required an export license for Russia. It is not clear from court documents if U.S. authorities were aware of the ultimate destination of the products. The Qorvo amplifiers, which are often

used in radar, communications and radio equipment, have been found in the radio communication circuits of Orlan drones, according to Ukrainian officials. In a statement to Reuters, Qorvo said the "declared destination" of the parts mentioned in the case was a distributor in Florida. It added: "Qorvo has never conducted business or had any relationship with IK Tech or Igor Kazhdan, and the Company's products were exported and used without our knowledge."

In November 2022, after Kazhdan pleaded guilty to two charges, a federal judge sentenced him to three years of probation, fined him \$200 and ordered him to forfeit about \$7,000. If convicted on all counts, Kazhdan could have faced 40 years in prison. Speaking on the doorstep of his Dania Beach, Florida, home, Kazhdan, wearing a scruffy beard in shorts and short-sleeve shirt, said the scale of his exports to Russia was minimal compared to other companies when it was put to him that he may have been assisting Russia's drone program.

"I just don't think that whatever this is, it's a big deal that you should be writing this story," Kazhdan said. "This is just comical." Beyond that, he would not speak about the case or his shipments to Russia. At his November 2022 sentencing hearing, Kazhdan told the Southern Florida District judge that he started doing business with Russia after making contact with importers at a 2016 satellite conference. Soon after, the importers convinced him to skirt reporting and licensing requirements, he said. The U.S. Department of Justice declined to comment on the case.

<https://www.reuters.com/world/europe/global-supply-trail-that-leads-russias-killer-drones-2022-12-15/>



*Fri, 16 Dec 2022*

## **North Korea Tests New Engine for Long-Range Missile Strikes**

North Korean leader Kim Jong Un oversaw the test of a new solid-fuel rocket engine that could enhance the state's ability to fire off quick-strike, longer-range missiles for delivering nuclear warheads. State media on Friday said Kim "guided the important test" of a "high-thrust solid-fuel motor," noting it was the first of its kind for the country. "This important test has provided a sure sci-tech guarantee for the development of another new-type strategic weapon system," the official Korean Central News Agency reported.

It also released photos of Kim, with cigarette in hand, smiling in front of a massive cloud of smoke from the test site at its Sohae Satellite Launching Ground, along with other shots showing flames shooting out from the place where it said the engine test took place. Solid-fuel missiles are quick to deploy and can be easier to hide, giving the US and its allies less time to see signs of a launch and prepare interceptors. Kim has been modernizing his missile arsenal over the past several years, and has rolled out new, nuclear-capable, short-range ballistic missiles that can hit US military bases in all of South Korea and parts of Japan.

"This is the largest solid fuel motor test ever conducted by North Korea," said David Schmerler, a senior research associate at the James Martin Center for Nonproliferation Studies with the

Middlebury Institute of International Studies at Monterey. “Solid fuel missiles require less preparation prior to launching as they are built with the fuel ‘baked’ into the missile body. Shorter launch times ultimately increase the survivability of the system,” he said.

The engine could be used for its Pukguksong series of submarine-launched ballistic missiles — a two-stage, nuclear-capable rocket that has a range to hit all of Japan. It could also be used for longer-range missiles, including possible intercontinental ballistic ones that could deliver a nuclear warhead to the US mainland. North Korea’s ICBMs use liquid-fuel engines, which take longer to prepare and give the US and its allies a greater chance to shoot them down on the launch pad than would be the case with a potential solid-fuel version.

This year, Kim’s regime has fired off more than 65 ballistic missiles, the most during his decade in power and in defiance of United Nations resolutions that bar the launches. He has stepped up the provocations in recent weeks in a display of anger at joint military drills in the region conducted by the US and its allies South Korea and Japan.

<https://www.hindustantimes.com/world-news/north-korea-tests-new-engine-for-long-range-missile-strikes-101671155462139.html>

## THE ECONOMIC TIMES

*Thu, 15 Dec 2022*

### **What Can the Patriot Missile Do for Ukraine?**

Patriot missile systems have long been a hot ticket item for the US and allies in contested areas of the world as a coveted shield against incoming missiles. In Europe, the Middle East and the Pacific, they guard against potential strikes from Iran, Somalia and North Korea.

So it was a critical turning point when news broke this week that the U.S. has agreed to send a Patriot missile battery to Ukraine - something Ukrainian President Volodymyr Zelenskyy has sought for months to augment his country's air defenses. U.S. officials have confirmed the agreement, and an official announcement is expected soon. But experts caution that the system's effectiveness is limited, and it may not be a game changer in the war.

A look at what the system is and what it does:

#### **What is the Patriot?**

The Patriot is a surface-to-air guided missile system that was first deployed in the 1980s and can target aircraft, cruise missiles and shorter-range ballistic missiles.

Each Patriot battery consists of a truck-mounted launching system with eight launchers that can hold up to four missile interceptors each, a ground radar, a control station and a generator. The Army said it currently has 16 Patriot battalions. A 2018 International Institute for Strategic Studies report found those battalions operate 50 batteries, which have more than 1,200 missile interceptors.

The U.S. batteries are regularly deployed around the world. In addition, Patriots also are operated or being purchased by the Netherlands, Germany, Japan, Israel, Saudi Arabia, Kuwait, Taiwan, Greece, Spain, South Korea, the United Arab Emirates, Qatar, Romania, Sweden, Poland and Bahrain.

The Patriot system "is one of the most widely operated and reliable and proven air missile defense systems out there," and the theater ballistic missile defense capability could help defend Ukraine against Iranian-supplied ballistic missiles, said Tom Karako, director of the Missile Defense Project at the Center for Strategic and International Studies.

### **Patriot Cost**

Over the years the Patriot system and missiles have been continually modified. The current interceptor missile for the Patriot system costs approximately \$4 million per round and the launchers cost about \$10 million each, CSIS reported in its July missile defense report. At that price, it's not cost effective or optimal to use the Patriot to shoot down the far smaller and dramatically cheaper Iranian drones that Russia has been buying and using in Ukraine. "Firing a million-dollar missile at a \$50,000 drone is a losing proposition," said Mark Cancian, a retired Marine Corps reserves colonel and senior adviser at CSIS.

### **Deployment Concerns**

A Patriot battery can need as many as 90 troops to operate and maintain it, and for months the U.S. was reluctant to provide the complex system because sending forces into Ukraine to operate it is a non-starter for the Biden administration. But there were also concerns that deployment of the system would provoke Russia, or risk that a missile fired could end up hitting inside Russia, which could further escalate the conflict. According to officials, the urgent pleadings of Ukrainian leaders and the devastating destruction of the country's civilian infrastructure, including loss of electricity and heat as winter drags on, ultimately overcame U.S. reservations about supplying the Patriots.

A key hurdle will be training. U.S. troops will have to train Ukrainian forces on how to use and maintain the system. Army soldiers assigned to Patriot battalions get extensive training to be able to effectively locate a target, lock on with radar and fire. The U.S. has trained Ukrainian troops on other complex weapons systems, including the High Mobility Artillery Rocket Systems, known as HIMARS. In many cases they've been able to shorten the training, getting Ukrainian troops out to the battlefield in weeks. Officials have declined to provide details on how long the Patriots training would take and where exactly it will be done.

### **Patriot Capabilities**

Ukraine faces a range of Russian threats, and the Patriot is good against some and not that useful against others. One former senior military official with knowledge of the Patriot system said it will be effective against short-range ballistic missiles and it represents a strong message of U.S. support, but one battery isn't going to change the course of the war. The official, who spoke on condition of anonymity because the Ukraine deal has not yet been made public, noted that one Patriot battery has a long firing range, but can cover only a limited broad area. As an example, Patriots can effectively protect a small military base, but can't fully protect a large city such as Kyiv. They could only provide coverage for a segment of a city.

Patriots are often deployed as a battalion, which includes four batteries. This won't be the case with Ukraine, which officials said would be receiving one battery. The Patriot has a more powerful radar that is better at discriminating targets than the Soviet-era S-300 system the Ukrainians have been using, but it has limitations, both Karako and Cancian said. Still the Patriot's ability to target some ballistic missiles and aircraft could potentially protect Kyiv if Russian President Vladimir Putin carried through on his persistent threat to deploy a tactical

nuclear device. But that would depend on how the weapon was delivered, Karako said. If it was a gravity bomb delivered by a warplane, the system could target the aircraft; if it was a cruise or short-to-medium-range ballistic missile, it could also possibly intercept the missile, Karako said.

Raytheon, which manufactures the Patriot, says it has been involved in 150 intercepts of ballistic missiles since 2015. The success rate of the Patriot, however, has been repeatedly questioned. A 1992 Government Accountability Office report said it could not find evidence to support reports that the system had achieved a 70% success rate against Scud missiles in the Gulf War. In 2018, Saudi Arabia's success in using Patriots against missiles fired by Houthi rebels in Yemen was questioned when videos surfaced of systems failing. But beyond the Patriot's capabilities, its deployment is a big statement of support for Ukraine. "There's a lot of symbolism here," Cancian said.

[https://m.economictimes.com/news/defence/what-can-the-patriot-missile-do-for-ukraine/amp\\_articleshow/96248854.cms](https://m.economictimes.com/news/defence/what-can-the-patriot-missile-do-for-ukraine/amp_articleshow/96248854.cms)



*Fri, 16 Dec 2022*

## **Russia to Double Intercontinental Missile Tests in 2023**

Russia is to double the number of test launches of its intercontinental ballistic missiles to eight in 2023 from four in 2022, the commander of strategic rocket forces was quoted as saying on Friday. Sergei Karakayev told the military newspaper Krasnaya Zvezda that the eight test flights would be scheduled from two launch sites - one near Murmansk in the north, the other near Volgograd in the south. In remarks reported by Tass news agency, Karakayev said four launches had taken place this year and "confirmed the high reliability of the missile systems". Under the New START nuclear arms reduction treaty, which took effect in 2011, both Russia and the United States are limited to 700 intercontinental ballistic missiles each.

Karakayev cited in particular the nuclear-capable Sarmat missile which underwent its first launch in April from Plesetsk in northern Russia, hitting a target on the Kamchatka peninsula 6,000 km (3,700 miles) away. The Sarmat had been under development for years but the April test came at time of extreme international tension, weeks into Moscow's invasion of Ukraine, now in its 10th month. Russian President Vladimir Putin said at the time there was no comparable missile and would "strengthen the combat potential of our armed forces". In his remarks to Krasnaya Zvezda, Karakayev said the Sarmat would form the foundation of the silo-based missiles armoury. "In the current circumstances, the creation of such a missile system for Russia means the strengthening of its strategic security," he said.

<https://www.moneycontrol.com/news/world/russia-to-double-intercontinental-missile-tests-in-2023-9714451.html>

## **Franco-Italian Boost for Ukraine! Kyiv could get SAMP/T Missile Defense System as S-300s get Bombed Out**

*By Tanmay Kadam*

Italy will be sending one of its systems to Ukraine, according to the information provided by the French ambassador to Ukraine, Etienne de Poncins, during a hearing before the National Defense and Armed Forces Committee of the French National Assembly. The hearing of the French ambassador to Ukraine was held on November 9, but its report was made public only on December 13. “France and Italy will provide Ukraine with the anti-aircraft defense instruments it requires. This is a strong request that President Zelensky has made, and the Italians have confirmed to us that they are ready to grant it. So we can meet their needs,” said the French ambassador. As EurAsian Times discussed previously, the resistance of Ukrainian forces against the Russian military is significantly dependent on its ability to deny the Ukrainian airspace to the Russian Aerospace Forces (VKS) and protect the country’s essential infrastructure from Russian large-scale missile and drone offensives.

### **Ukraine Gets Multiple Air Defense Systems**

Ukraine fielded medium and long-range air defenses, like the S-300s and Buk-M1s, which forced the Russian fighter jets to fly at altitudes below 4500 meters, right into the range of the man-portable air defense systems (MANPADS). These MANPADS accounted for a significant number of shoot-downs of Russian aircraft. However, Ukraine has lost around 36 S-300 launchers so far, according to the figures compiled by the military tracking blog Oryx based on visual confirmations. The actual number of losses may be higher. Reports in July suggested that Ukraine’s air defenders are losing S-300 launchers at a rate of at least three or four a week.

Additionally, in recent months, the Russian military has repeatedly been filling the Ukrainian skies with a salvo of missiles and loitering munitions to overwhelm the Ukrainian air defense systems, which has been depleting Ukraine’s stockpile of surface-to-air missiles at a heavy rate. Therefore, as recently announced by Ukrainian Defense Minister Oleksii Reznikov, Kyiv is discussing replenishing Ukraine’s stock of S-300 missiles with other countries.

In addition, Ukraine has also been requesting its Western partners to bolster its air defense systems by providing the Ukrainian military with advanced capability. The Franco-Italian SAMP/T happens to be one such weapon system. In an interview with Le Monde on December 9, Reznikov said: “We are asking for SAMP/Ts and the Franco-Italian Mamba system. The French side reacted positively to our request, but the negotiation is not over with the Italian side.” The latest announcement by the French ambassador to Ukraine suggests that even Italy is on board now, and the last obstacle has been overcome.

With this, the SAMP/T is all set to join other Western air defense systems already provided to Ukraine, including the German IRIS-T, the Norwegian NASAMS delivered by the US, the Italian Aspide delivered by Spain, or the Mistral and French Crotale NG.



Ukraine may additionally get the American-made Patriot missile defense systems. The American media outlet CNN recently reported citing unnamed US officials, that the Biden administration plans to approve the Patriot system for Ukraine, which Kyiv has aggressively requested.

### **SAMP/T Missile Defense System**

The SAMP/T, also known as MAMBA in the French military, is a theatre anti-missile system manufactured by Eurosam, a 50:50 joint venture between MBDA and Thales. It is intended to defend the critical fixed assets and deployed troops against all present and potential airborne threats, including cruise missiles, manned and unmanned aircraft, and tactical ballistic missiles. Also, the SAMP/T can function in areas with heavy electronic countermeasures and extreme clutter. The SAMP/T was operationally deployed by the French Army and Air Force, as well as the Italian Army, in 2011. The system is interoperable with other NATO air defense systems. It can be entirely flown by a NATO tactical transport aircraft, such as the Airbus A400M and Lockheed-Martin C-130J Super Hercules. Two essential parts of the SAMP/T system are the Aster 30 interceptor missile and the Arabel multi-purpose radar. The Aster 30 missile can travel at a speed of 1.4 kilometers per second and can intercept targets at altitudes from 50 meters to 20 kilometers. It is a two-stage missile in which the booster steers the missile toward the target and separates a few seconds following the launch. The missile's maximum range against aircraft targets flying at altitudes above and below three kilometers is 100 kilometers and 50 kilometers, respectively. Apart from hostile aircraft, the SAMP/T system can engage various missiles, including cruise missiles, stand-off missiles, and anti-radiation missiles. While the Arabel is a 3D phased array radar developed by Thales that rotates to provide 360-degree coverage, the radar operates at 150kW peak power and has a range of 100 kilometers. It can track up to 100 targets and engage ten simultaneously.

In addition, the SAMP/T system can be used with different long-range radars, such as the Thales GM400 long-range radar, which has a detection range between 300-400 kilometers. A complete SAMP/T system comprises four launcher vehicles, a Thales Arabel multifunction radar with a friend or foe recognition system, an engagement module based on a command and control (C2) vehicle, and an electric generator mounted on a vehicle. The launchers are accompanied by two vehicles with hydraulic cranes and trailers carrying extra missiles for reloading.

<https://eurasianimes.com/franco-italian-boost-for-ukraine-kyiv-could-get-samp-t-missile/>



*Fri, 16 Dec 2022*

## **Wiping Out F-16 Vipers, Chinese Military Expert Claims its Dongfeng Missiles can 'Pierce' Taiwan's Blast-Proof Hangars**

*By Ashish Dangwal*

In November, Taiwan unveiled its plans to construct missile-proof hangars at an air base in Taichung that could survive attacks from the Chinese Dongfeng series of ballistic missiles. The

Ministry of National Defense (MND) initially proposed a plan to construct the hangars in 2020 with a seven-year budget of NT\$4.392 billion (US\$136.59 million), to finish the project by 2026. The hangars are designed to protect military aircraft, especially the country's most technologically advanced F-16 Vipers, and maintain their combat capability in the event of an attack from China. However, experts warned that Taiwan's ambitions to construct stronger hangars for its fighter jets might become useless because the Chinese military has developed short-range guided missiles.

These missiles are capable of penetrating any reinforced aviation base. Andrei Chang, editor-in-chief of Canada-based military magazine *Kanwa Asian Defense*, told the SCMP that the terminal infrared image guidance and BeiDou satellite navigation systems are presently used by China's ballistic missiles and multiple launch rocket system (MLRS).

Chang added that this enabled the missiles to precisely attack and breach any heavily fortified aircraft hangar. He made his point by using a promotional video for the M20 surface-to-surface short-range tactical missile, also known as the DF-12, by the People's Liberation Army (PLA). Taiwan's Air Force chief Huang Chih-Wei recently said that the hangars would have a maximum anti-bomb capacity of 3,300 pounds and could withstand a single warhead weighing 1,500 pounds (0.7 tons) of explosives. According to Lu Li-Shih, a former instructor at Taiwan's Naval Academy in Kaohsiung, experts assessed the proposed 3,300-pound anti-bomb capability based on the striking power of the PLA's DF-16 short-range missile. The missile has a strike range of between 800 and 1,000 kilometers and can carry a one-ton payload.

### **Can China's Short-Range Missiles Wipe Out Vipers?**

Following the US House Speaker Nancy Pelosi's visit to Taipei in August, Beijing staged days of extraordinary live-fire drills close to Taiwan. One of the primary PLA weapons used to strike the waters near Taiwan was the DF-16 short-range missile. Taiwan is likewise aware of Beijing's missile capabilities. As a result, Taipei has been updating its defensive capabilities in case of any potential Chinese attack. In recent years, Taiwan has modernized its outdated fighter fleet as regular Chinese intrusions continually stress its air force. The fleet of F-16 vipers is essential to Taipei's military capabilities to continue warding off Chinese aircraft. The island deployed its first squadron of US-built F-16V fighters in November 2021. These aircraft are an updated and far more advanced version of the island's existing F-16 fighters, which date back to the 1990s.

In August, Taipei conducted its drills to simulate the Chinese invasion defense. Its Air Force troops outfitted an F-16V fighter with a US-made anti-ship missile in a "combat readiness" exercise. The heavily protected hangars are made to safeguard the F-16V aircraft, ensuring they can still function in unforeseen circumstances and fulfill their mission of thwarting the Chinese invasion. In July, the Taiwanese Air Force published images of weapons loading procedures in the heavily guarded underground facility attached to Chiashan Air Force Base.

The images provided an extremely rare peek inside the underground tunnel network that shelters some of the ROCAF's most powerful fighter jets, including a recently modified F-16V Viper armed with Harpoon anti-ship missiles. According to Li-Shih, Taiwanese fighter jets were formerly housed in ventilated hangars with no blast-resistant designs. In the event of an attack, every airbase in Taiwan is at risk. But the new hangars can better protect fighter jets and make PLA strikes more complex. That being said, the four-ton (8,820-pound) Dongfeng (DF) missile, according to Chang, could be fitted with "fuel-air warheads," which utilize oxygen from the surrounding air to create a high-temperature explosion that destroys targets. Chang added that

when facing the PLA, all measures to bolster fighter aircraft hangars in Taiwan would be nil because of the missiles' circular error probability of less than one meter (3.3 feet).

Even though the DF-12 is now only available for export, a source close to the PLA informed SCMP that the mainland had produced several short-range missiles and MLRS with various attack capabilities that were intended to target Taiwan's governmental and military structures. Overall, the circular error probability for all the warheads is a little less than one meter, allowing for pinpoint hits that could destroy the target and its surroundings.

<https://eurasianimes.com/wiping-out-f-16-vipers-chinese-military-experts-claims/>

**BUSINESS INSIDER**  
INDIA

*Fri, 16 Dec 2022*

## **Japan may Build 2 Huge Warships to Counter the Growing Missile Threat from North Korea**

*By Benjamin Brimelow*

On November 21, Japan's Maritime Self-Defense Force announced that its two newest destroyers, JS Maya and JS Haguro, had successfully conducted anti-ballistic missile tests off the coast of Hawaii. The announcement means Japan now has eight mission-capable ballistic-missile defense destroyers, and comes amid a record-setting series of missile tests by North Korea, with over 50 missiles launched in the past two months and eight ICBMs since January. At least one of those missiles, launched on October 3, flew directly over the Japanese mainland — the first to do so in five years. The launches have forced Japan to examine its unique ballistic-missile defense system, which relies heavily on specially equipped warships to intercept incoming missiles.

### **Ballistic-missile defense**

Japan began developing its current BMD system in 2004. Since then, it has evolved into a multi-tier BMD system involving all three branches of Japan's Self-Defense Forces. The Japanese Maritime Self-Defense Force's Aegis Ballistic Missile Defense System-equipped destroyers are tasked with intercepting ballistic missiles in their mid-course stage, when they're still outside the earth's atmosphere. Japan's Air Self-Defense Force commands Patriot missile-defense batteries with Patriot Advanced Capability-3 missiles that are designed to intercept ballistic missiles in their terminal stage, after they reenter the atmosphere. Finally, Japan's Ground Self-Defense Force commands Type 03 medium-range surface-to-air missile systems meant to intercept any missiles in the medium range of airspace.

The interceptors are linked into a massive network of satellites, radars, ships, and aircraft that monitor the area around Japan for any incoming threats. The data they collect is uploaded to the Japan Aerospace Defense Ground Environment, Japan's warning and control system.

Within minutes of a threat being detected, JADGE calculates a possible point of impact and orders relevant defense systems to prepare for intercept. JADGE also issues an evacuation order, if needed.

## **BMD destroyers**

The Aegis-equipped BMD ships are the most important part of Japan's BMD system. Eight are in service: four Kongō-class destroyers (Kongō, Kirishima, Myōkō, and Chokai), two Atago-class destroyers (Atago and Ashigara), and two Maya-class destroyers (Maya and Haguro).

The Maya-class vessels are the newest, commissioned in 2020 and 2021. They are also the first BMD destroyers designed specifically for the BMD role. The others were retrofitted after entering service. The Mayas have 96 vertical-launch tubes capable of firing a mix of Type 07 anti-submarine rockets, Type 90 or Type 17 anti-ship missiles, and RIM-162 Evolved Sea Sparrow missiles. The most important armament, though, is the interceptors — the SM-3 and SM-6 missiles. The recent tests involving Maya and Haguro in Hawaii saw Maya successfully intercept a ballistic missile outside the atmosphere with an SM-3 Block IIA missile and Haguro intercept another missile outside the atmosphere with an SM-3 Block IB. In a third shoot-down, Haguro intercepted a missile that was being tracked by Maya, demonstrating integrated missile-defense capabilities that the JSDF has long sought.

There are advantages to relying on maritime-based platforms for missile defense. Their mobility allows them to cover a larger area and get closer to enemy launch points. It also makes it harder for enemies to target and destroy them. By launching from open ocean, BMD ships also ensure that no booster debris from SM-3 and SM-6 missiles land in populated areas — a major reason Japan canceled the acquisition of the Aegis Ashore system in 2020. In September, Japan's Ministry of Defense announced that Japan would build two new BMD destroyers.

The proposed ships would be 690 feet long, 130 feet wide, and displace some 20,000 tons, making them among the largest ships in the Japanese fleet since World War II. They would be larger than the US's Zumwalt-class destroyers and slightly smaller than Japan's Izumo-class carriers, which are being converted to operate F-35B jets. The new ships' bigger size would allow the JMSDF to send them on longer deployments, operate them in foul weather, arm them with more missiles, and equip them with the massive SPY-7 radar. The first ship is planned to be commissioned in 2028 and the second in 2029.

## **An urgent need**

Relying on warships for ballistic-missile defense also has disadvantages, chiefly the cost. The ships need to be large, mobile, loaded with extremely sophisticated software, and have specially trained crews. They wouldn't usually venture far from their patrol areas around Japan, but each would need to spend considerable time in port for maintenance or crew training, meaning Japan would need a fairly large number of them to ensure enough were deployed at any given time.

"The issue with sea-based missile-defense systems is if you're building really big expensive ships that are going to stay in one place, then you might as well save the money and build these really big systems on shore," Zack Cooper, a senior fellow at the American Enterprise Institute, told Insider.

"You might have to have six ships to keep two on site at any one time, and building six expensive missile-defense ships is probably really not the best way to take up pretty valuable shipyard time," Cooper added.

The proposed 20,000-ton BMD destroyers are estimated to cost as much as \$7.1 billion, a massive price given recent economic woes and fears of an impending global recession. That may be why the Japanese government has reportedly scaled back the size of the two new planned

ships to about that of the Maya-class ships. The decision regarding the ships is likely to be made clear in Japan's new National Defense Program Guidelines, which are set to be released in mid-December. Japan's need for ballistic-missile defense is only growing more urgent, however. So far this year, North Korea has conducted a record number of missile launches, firing IRBMs, ICBMs, SLBMs, and, most worrying for Japan, hypersonic missiles. If Japan sticks with sea-based missile defense, it may acquire two more BMD destroyers of an entirely new design or build more Maya-class vessels to save money and time.

Tokyo could also change its mind and adopt Aegis Ashore. Maintenance and training on the land-based system would be less of an issue, and it may end up being cheaper: When Japan canceled the program in 2020, it was expected to cost \$4.2 billion over 30 years. "In the North Korea context, where you basically know exactly where the missiles are being shot from and where they would be aimed toward, it just doesn't make a whole lot of sense to build a whole bunch of missile-defense destroyers just to keep two on station at any one time," Cooper said.

<https://www.businessinsider.in/international/news/japan-may-build-2-huge-warships-to-counter-the-growing-missile-threat-from-north-korea/articleshow/96264913.cms>



*Fri, 16 Dec 2022*

## **Russia Says U.S. Air Defence Systems could be Targets in Ukraine**

Russia's Foreign Ministry warned on December 15 that if the U.S. delivers sophisticated air defence systems to Ukraine, those systems and any crews that accompany them would be a "legitimate target" for the Russian military, a blunt threat that was quickly rejected by Washington. The exchange of statements reflected soaring Russia-U.S. tensions amid the fighting in Ukraine, which is now in its 10th month.

Russian Foreign Ministry spokeswoman Maria Zakharova said the U.S. had "effectively become a party" to the war by providing Ukraine with weapons and training its troops. She added that if reports about U.S. intentions to provide Kyiv with Patriot surface-to-air missile system prove true, it would become "another provocative move by the U.S." and broaden its involvement in the hostilities, "entailing possible consequences." "Any weapons systems supplied to Ukraine, including the Patriot, along with the personnel servicing them, have been and will remain legitimate priority targets for the Russian armed forces," Ms. Zakharova declared.

Asked about the Russian warning, Pentagon spokesman Air Force Gen. Pat Ryder responded that the U.S. was "not going to allow comments from Russia to dictate the security assistance that we provide to Ukraine." "I find it ironic and very telling that officials from a country that brutally attacked its neighbour — in an illegal and unprovoked invasion, through a campaign that is deliberately targeting and killing innocent civilians and destroying civilian infrastructure — that they would choose to use words like 'provocative' to describe defensive systems that are meant to save lives and protect civilians," Mr. Ryder said.

Russia's Foreign Ministry warned on December 15 that if the U.S. delivers sophisticated air defence systems to Ukraine, those systems and any crews that accompany them would be a "legitimate target" for the Russian military, a blunt threat that was quickly rejected by Washington. The exchange of statements reflected soaring Russia-U.S. tensions amid the fighting in Ukraine, which is now in its 10th month.

Russian Foreign Ministry spokeswoman Maria Zakharova said the U.S. had "effectively become a party" to the war by providing Ukraine with weapons and training its troops. She added that if reports about U.S. intentions to provide Kyiv with Patriot surface-to-air missile system prove true, it would become "another provocative move by the U.S." and broaden its involvement in the hostilities, "entailing possible consequences." "Any weapons systems supplied to Ukraine, including the Patriot, along with the personnel servicing them, have been and will remain legitimate priority targets for the Russian armed forces," Ms. Zakharova declared.

Asked about the Russian warning, Pentagon spokesman Air Force Gen. Pat Ryder responded that the U.S. was "not going to allow comments from Russia to dictate the security assistance that we provide to Ukraine." "I find it ironic and very telling that officials from a country that brutally attacked its neighbour — in an illegal and unprovoked invasion, through a campaign that is deliberately targeting and killing innocent civilians and destroying civilian infrastructure — that they would choose to use words like 'provocative' to describe defensive systems that are meant to save lives and protect civilians," Mr. Ryder said. U.S. officials said on Dec. 13 that Washington was poised to approve sending a Patriot missile battery to Ukraine, finally agreeing to an urgent request from Ukrainian leaders desperate for more robust weapons to shoot down incoming Russian missiles that have crippled much of the country's vital infrastructure. An official announcement is expected soon.

Operating and maintaining a Patriot battery requires as many as 90 troops, and for months the U.S. has been reluctant to provide the complex system because sending American forces into Ukraine to run the systems is a nonstarter for the administration of President Joe Biden. Even without the presence of U.S. service members to train Ukrainians on use of the system, concerns remain that deployment of the missiles could provoke Russia or risk that a fired projectile could hit inside Russia and further escalate the conflict. Russia has repeatedly claimed that its forces struck Western-supplied weapons in Ukraine, but those statements have been impossible to independently verify. Ukraine has so far been cautious in reacting to the reports.

Hanna Maliar, Ukraine's Deputy Defence Minister, told reporters on Dec. 15 in Kyiv that the delivery of such weaponry remains "sensitive not only for Ukraine, but for our partners," and that only President Volodymyr Zelensky or Defence Minister Oleksiy Reznikov would make any official announcement on such an agreement.

White House and Pentagon leaders have said consistently that providing Ukraine with additional air defences is a priority, and Patriot missiles have been under consideration for some time. As the winter closed in and the Russian bombardment of civilian infrastructure escalated, official said, the idea became a higher priority.

Until now, the U.S. and other NATO allies have provided Ukraine with short- and medium-range air defence systems that can down Russian aircraft and drones but not ballistic and cruise missiles. Ukraine's electricity provider said on Dec. 15 that the country's energy system had a "significant deficit of electricity," and that emergency shutdowns had been applied in some areas as temperatures hover around or below freezing. The state-owned grid operator Ukrenergo

warned in a statement on Facebook that damage caused to energy infrastructure by Russian attacks is being compounded by harsh weather, including snow, ice and strong winds.

The southern Ukrainian city of Kherson was left completely without power following Russian shelling on Thursday, according to Kyrylo Tymoshenko, Deputy Head of the Ukrainian President's office, who wrote on Telegram. He added that two people were killed in the attacks. Heavy shelling of the city's Korabelny district was still underway in the afternoon, and Russian shells hit 100 meters (yards) from the regional administration building, he said.

Amid the infrastructure attacks and power outages across the country, seven civilians were killed and 19 wounded on Dec. 13 and 15, according to a report issued by the Ukrainian President's office. The head of Ukraine's eastern Donetsk Province, Pavlo Kyrylenko, reported that Russian strikes the previous day had killed two civilians and wounded seven. Kremlin-backed authorities in the region, which was illegally annexed by Moscow in September, announced that Russia had taken control of 80% of the city of Marinka, seen as critical to Ukrainian hopes of retaking the Russian-held regional capital, Donetsk. The Moscow-installed Mayor of Donetsk, Aleksei Kulemzin, said on Dec. 15 that the city centre had been hit by "the most massive strike" since the area came under the control of Russian-backed separatists in 2014.

Writing on Telegram, Mr. Kulemzin said 40 Ukrainian rockets struck Donetsk on Dec. 15 morning, noting that multistory residential buildings were hit and that fires broke out at a hospital and university campus.

Elsewhere, Ukrainian forces shelled Russia's western Kursk Province, according to regional Gov. Roman Starovoyt. Six shells reportedly struck a farm in the Province's Belovsky district, which borders Ukraine's Sumy Province. There were no casualties, Mr. Starovoyt wrote on Telegram.

<https://www.thehindu.com/news/international/russia-says-us-air-defence-systems-could-be-targets-in-ukraine/article66268866.ece>

**R. REPUBLICWORLD.COM**

*Fri, 16 Dec 2022*

## **Ukraine Defence Minister Warns Putin Prepares for a Renewed Offensive in the New Year**

Vladimir Putin has been preparing for a major new offensive in the new year, despite a series of humiliating battlefield setbacks for Russia in recent months said Senior Ukrainian officials, reported the Guardian. While talking to the Guardian, The defence minister of Ukraine, Oleksii Reznikov said that Ukraine has been able to successfully defend itself against Russia's missile attacks that have targeted key infrastructure, including the energy grid and said that evidence proves that Moscow has been preparing a broad new offensive.

Reznikov, Ukrainian president, Volodymyr Zelenskyy, the head of the armed forces, Gen Valerii Zaluzhnyi, and the chief of ground forces, Col Gen Oleksandr Syrskii are among those who have raised the same concern about Russia's new strategy for aggressive attacks on

Ukraine. Ukraine's defence minister Oleksii Reznikov has warned Kremlin has not accepted the defeat yet and has been preparing 'considerable troops for a renewed offensive in the new year'.

### **Ukraine -Russia war: Ukraine's defence minister warns**

There have been reports that have shared that Russia has been preparing for its next offensive strategy for the next year which is being warned by the Ukrainian defence minister, Reznikov.

Reznikov said, "The [draftees] do a minimum of three months to prepare. It means they are trying to start the next wave of the offensive probably in February, like last year. That's their plan," reported the Guardian. Further, he has labelled Russia's main tactics as a "meat grinder" and said that Putin has planned to "throw as many bodies at the conflict as possible in hopes of overwhelming a limited Ukrainian force". He also revealed only half of the Russian forces have been deployed and more than three lakh have been trained and would be deployed on the frontline in January or February, reported the Guardian. "The Kremlin is trying to find new solutions [for] how to get the victory," said Reznikov while talking to the Guardian. Similar concerns have been raised by other senior Ukrainian officials who have said to not stay complacent. These concerns accelerated after Putin ordered a partial military mobilisation in September to bolster forces in Ukraine. However, Moscow had been embarrassed by not being able to serve and had been conscripted. In the Ukraine -Russian war, dozens of drones have been shot down said a Ukrainian official on Wednesday.

<https://www.republicworld.com/world-news/russia-ukraine-crisis/ukraine-defence-minister-warns-putin-prepares-for-a-renewed-offensive-in-the-new-year-articleshow.html>

## **Science & Technology News**



*Thu, 15 Dec 2022*

### **26th Edition of IIT Bombay's Techfest is Ready with its Highlights and Show-stoppers to Pull the Crowd from all Over the Nation**

IIT Bombay's Annual science and technology festival, Techfest is all set to come back offline after two long years of the pandemic. Over the years, the event has set new standards by raising the bar for excellence every year. Adhering to this we are back with the 26th edition of Techfest from 16th to 18th of December discovering some unprecedented technological wonders.

**Drone Light Show:** This year, Techfest will light up the skies of Mumbai with a magnificent Drone Light Show. Hundreds of drones will come together to create a captivating experience for all attendees, with dazzling choreography and a once-in-a-lifetime experience. A perfect fusion of art and technology, enlightening the sky and minds of all. The drone show will take place for



the first time in the history of Techfest at IIT Bombay campus on the 18th of December, against the dramatic backdrop of the Mumbai skyline and Arabian sea.

**JIO – 5G Launch:** Techfest in association with Jio will be launching the 5G network for consumer testing in India making IIT Bombay the first 5G-fied Institute and Mumbai the first city with 5G consumer operating network in India. With this launch, India will become the 11th country in the world to have a 5G network alongside others being China, the USA, and South Korea

**Techfest Drone Racing League:** Techfest, for the first time in its history, is conducting Techfest Drone Racing League. Being one of the most elite extravaganza events of Night Drone Racing, witness the drones slicing through the air with the absolute speed on 16th of December, at the gymkhana grounds of IIT Bombay, to win prizes worth INR 1,00,000

**Lectures:** Techfest this year will be hosting Ms. Tarja Halonen, the 11th president of Finland and the first-ever woman president of Finland, Mr. Suresh Prabhu – Former Indian Railway Minister, Mr. Lars Rasmussen – Co-founder of Google Maps, Ms. Kathryn Lueders – Associate Administrator of the HEO, NASA, Dr. G. Satheesh Reddy – Former Chairman of DRDO, Octavian Morariu – Member of the International Olympic Committee, Masayasu Ishida – Co-founder and CEO of Spacetime Foundation, V. Narayan – Director of Liquid Propulsion System Centre at ISRO.

**Exhibitions:** Techfest exhibition will be displaying some of the best and most unique innovations in the field of science and technology like BrahMos – The world’s fastest Anti-Ship Cruise Missile; Formula E M8 Electro Gen2; Unitree GO1- The World’s First Intelligence Bionic Quadruped Robot; SpaceHopper ETH Zurich – A Small Scale Legged Robot for Low-Gravity Space Exploration; Raptor ETH Zurich – A drone for quickly picking objects of any geometry; INDRO – Tallest humanoid robot built in India; ISRO – Indian Space Research Organisation. In addition to this Techfest will be garnering participation from all over the world in competitions like the International Robowars, International Full Throttle and Boeing Aeromodelling Challenge. It would be our pleasure to host you at this astounding forum for knowledge exchange at IIT Bombay from 16th to 18th December.

<https://www.punekarnews.in/26th-edition-of-iit-bombays-techfest-is-ready-with-its-highlights-and-show-stoppers-to-pull-the-crowd-from-all-over-the-nation/>



*Thu, 15 Dec 2022*

## **Boosting the Space Sector for Indian Private Players**

India’s space sector is gearing up for a new era. Lately, the space domain has seen a tremendous policy thrust that is aimed at addressing the gaps in commercial applications. While India has achieved success in space exploration, it hasn’t been able to fully involve the private sector in commercial space programmes. Overall, India’s space programme has been entirely driven by the Indian Space Research Organisation (ISRO).

While India's space economy was estimated to be \$9.6 billion in 2020, it has been largely driven by government-funded programmes. Despite this, India's space sector accounts for only 2% of the global space economy. In this scenario, the policy direction is to assimilate private players in the space domain. The government plans to achieve this by backing the private sector with hand-holding from the space agency. The plan is to reach to touch \$12.8 billion by 2025.

### **Space sector for private players**

Since the opening up of the defence sector, a total of 584 industrial licences have been issued to 358 companies for the manufacturing of various defence items. A major policy reform has been based on the initial validity of the industrial license granted under the Industries (Development & Regulation) Act. One highlight of this reform is the extension of the licensing term from three years to 15 years. This has opened up opportunities for private companies, providing them with sufficient time to start operations and manufacture without hindrance.

The whole space programme for the private sector unfolded with the formation of the Indian National Space Promotion and Authorisation Centre (IN-SPACe), as a single-window, independent, nodal agency that functions as an autonomous agency in the Department of Space (DOS). The government has also formed a body that will represent startups in the space sector – Indian Space Association (ISpA). It has brought all the private entities such as Agnikul, Astrome, Bellatrix, Dhruva, Digantra, TSC Technologies, and Skyroot under one umbrella. There are already more than 100 space startups in India and collectively they have raised more than \$245.35 million in funding. Lt. Gen. AK Bhatt (Retd), Director General, ISpA looks at the initiatives in the space domain and some of the major milestones. “The growth achieved by India's private space industry is the result of the landmark decision taken by our PM Narendra Modi in 2020 to open our space industry to the private sector,” he says.

“As we look back at the year 2022, the industry witnessed some major milestones in the growth journey of the private sector with NSIL authorising the space conglomerate formed by Larsen & Toubro (L&T) and HAL, a Rs 860-crore contract for the commercial development of the next five Polar Satellite Launch Vehicles (PSLVs), the pact of OneWeb with NewSpace India Limited (NSIL) to launch LEO satellites from India, and signing the first licence contract with DoT for satellite broadband followed by the successful launch of 36 LEO satellites from Sriharikota,” said General Bhatt highlighting the role of the private players in space.

### **Space launches**

General Bhatt points out the recent launch of the Private Launch Vehicle from Skyroot this year. He further elaborates: “It has made significant strides in the growth of the private space industry and also a rising Indian space startup like Pixxel launched its third hyperspectral satellite ‘Anand’ for Earth observation applications following the launch of ‘Shakuntala’ earlier this year.”

Another startup Dhruva Space successfully validated its Satellite Orbital Deployer during the PSLV C53 mission and subsequently launched two nanosatellites for amateur communications in PSLV C54 using the P-dot satellite platform. In another milestone, Digantara, a space startup, built the world's first commercial space weather sensor. In the space vehicle area, Agnikul Cosmos established India's first private space vehicle launchpad at Sriharikota. This is the most complex set of space ecosystems and as General Bhatt points out, “it has taken place under the aegis of IN-SPACe.”

The breakthroughs in space launches are also being supported through the 75 Defence Space Challenges Mission called DefSpace. It was launched by the prime minister during DefEXPO 2022. The space policy also touches upon spectrum allocation. The success of such policy initiatives for private players depends on the viability of how these nascent start-ups continue the groundwork. The access to spectrum and the requisite bandwidth must be cost-effective for them to sustain their investments over time. General Bhatt talks about the challenges as he explains that the government aims to bring together industry stakeholders for their suggestions on the new Space Policy, spectrum allocation, and licensing framework for establishing a satellite earth station gateway.

### **Space sector for digital communications**

The critical area in the space domain is to spur the growth of digital communication. This is again based on the spread of satellite communication in the country. The larger debate is on how to address the converging interest.

To further support the growing space industry and reduce the 'Digital Divide', the government may consider the administrative allocation of spectrum. Bhatt further explains how satellite communication is going to unfold. He clarifies the frequency aspect. "The sustainable growth of satellite communications in India depends on the harmonization of 28 GHz frequency according to the global standards set by ITU, as the retention of 28 GHz frequency within the space sector will support and help connect the unconnected and provide impetus to local manufacturing & innovation."

### **New space policy for India**

While the Indian space sector has seen private companies gearing toward launching and building small satellites, the entirety of such programmes again depends on the Indian Space Policy. The overarching policy draft is still under the consideration. How soon it becomes a reality is yet to be seen. "We expect the new 'Indian Space Policy' to be announced, this will enable India to likely achieve the capabilities much early, as compared to other developed countries like the US. The new 'Indian Space Policy' followed by the Space Activity Bill will be a complete game changer which will cover upstream and downstream activities and will help formulate a vision to bolster the investment climate in the private space sector," Bhatt remarks on the impending draft which needs to see the light of the day. Besides, the government has also launched the Production Linked Incentive (PLI) scheme for satellite manufacturing just like mobile handsets and telecom equipment. "It will further boost the private space ecosystem and help encourage new startups to come up," Bhatt points out.

"The Indian space industry is at a growing stage and access to cost-effective capital for startups will further give impetus to the rapid growth. With the private companies shaping up and increasing production, there is also a need for holistic skills development which is the competency of systems engineering, training on how to operate satellites skilfully, and technology associated with special alloy for launch vehicles."

<https://www.financialexpress.com/defence/boosting-the-space-sector-for-indian-private-players/2915038/>

*Thu, 15 Dec 2022*

## **ISRO Launched 177 Foreign Satellites in 5 years, Generated over Rs 1000 Crore: Govt**

Union Minister of State Science & Technology Jitendra Singh said ISRO (Indian Space Research Organisation) has launched 177 foreign satellites belonging to 19 countries in the past five years. In a written reply to a question in Rajya Sabha on Thursday, Singh said that ISRO launched these satellites from January 2018 to November 2022.

Singh said that the satellites belonging to countries like Australia, Brazil, Canada, Colombia, Finland, France, Israel, Italy, Japan, Lithuania, Luxembourg, Malaysia, Netherlands, Republic of Korea, Singapore, Spain, Switzerland, United Kingdom and the USA, onboard PSLV and GSLV-MkIII launchers under a commercial agreement. Jitendra Singh said that Forex generated through the launching of these 177 foreign satellites from January 2018 to November 2022 is approximately 94 million USD (approx Rs 779 crore) and 46 million Euro (approx Rs 405 crore). As per Singh, far-reaching reforms in the space sector were announced in June 2020, with the intent of enhancing the nation's share in the global space economy. A press release by the Department of Space stated, "the creation of IN-SPACE as a single-window agency for the promotion and handholding of Non-Government Entities in conducting end-to-end space activities has resulted in a remarkable interest in the Start-up community, with 111 space-startups registered, as on date, on the IN-SPACE digital platform."

<https://www.indiatoday.in/science/story/isro-foreign-satellites-launched-forex-generated-five-years-2309708-2022-12-15>

## **Business Standard**

*Thu, 15 Dec 2022*

## **ICAR-IARI Develop Drought-Tolerant, High-Yielding Chickpea 'Pusa JG 16'**

The government's research organisations ICAR and IARI have developed drought tolerant variety of chickpea 'Pusa JG 16' that has potential to boost yield of chickpea in central India. Indian Council of Agricultural Research (ICAR)-Indian Agricultural Research Institute (IARI), in collaboration with Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV) Jabalpur, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior and ICRISAT, Patancheru, Hyderabad have developed drought hardy and higher yielding chickpea variety 'Pusa JG 16', according to a statement. The variety will enhance productivity in the drought prone areas of Central Zone consisting of Madhya Pradesh, Bundelkhand area of Uttar Pradesh, Chhattisgarh, Southern Rajasthan, Maharashtra and Gujarat, where terminal drought is a major problem and sometimes leads to 50-100 per cent loss of yield.

"Pusa JG 16 variety was developed by using genomic assisted breeding techniques that allowed precision transfer of drought tolerant genes from ICC 4958 in the parental variety JG 16. The drought tolerance of this variety was affirmed through national level testing by the All India Coordinated Research Programme of Chickpea," it added. This variety is resistance to fusarium wilt and stunt diseases, having short duration maturity (110 days) and a yield potential of 2 tonnes per hectare under drought stress conditions over the recurrent parent JG 16 (1.3 tonnes/hectares). Dr A K Singh, Director ICAR-IARI expressed happiness on the notification of chickpea variety 'Pusa JG 16' by the Ministry of Agriculture. He emphasised that this variety will be a boon for the farmers of drought prone areas of Central zone of the country.

[https://www.business-standard.com/article/economy-policy/icar-iari-develop-drought-tolerant-high-yielding-chickpea-pusa-jg-16-122121500924\\_1.html](https://www.business-standard.com/article/economy-policy/icar-iari-develop-drought-tolerant-high-yielding-chickpea-pusa-jg-16-122121500924_1.html)



Thu, 15 Dec 2022

## Indian PhD Student at Cambridge University Solves 2,500-Year-old Sanskrit Puzzle

A grammatical problem that has defeated Sanskrit scholars since the 5th Century BC has finally been solved by an Indian PhD student at the University of Cambridge, it emerged as his thesis was published on Thursday. Rishi Rajpopat made the breakthrough by decoding a rule taught by Panini, known as the father of linguistics, and is now encapsulated in his thesis entitled 'In Panini, We Trust: Discovering the Algorithm for Rule Conflict Resolution in the Astadhyayi'.

"I had a eureka moment at Cambridge!"

The world's greatest grammatical puzzle that had defeated scholars for centuries has been cracked by #Sanskrit PhD student @RishiRajpopat.

Read how he did it □ @stjohnscam@CambridgeFames@HCI\_London

— Cambridge University (@Cambridge\_Uni) December 15, 2022

According to the university, leading Sanskrit experts have described Rajpopat's discovery as "revolutionary" and it could now mean that Panini's grammar can also be taught to computers for the first time.

"I had a eureka moment in Cambridge," recalls Rajpopat.

"After nine months of trying to crack this problem, I was almost ready to quit, I was getting nowhere. So, I closed the books for a month and just enjoyed the summer, swimming, cycling, cooking, praying and meditating. Then, begrudgingly I went back to work, and, within minutes, as I turned the pages, these patterns started emerging, and it all started to make sense. There was a lot more work to do but I'd found the biggest part of the puzzle," said the 27-year-old scholar.

Over the next few weeks, he was so excited that he couldn't sleep and would spend hours in the library, including in the middle of the night, to check what he'd found and solve related problems. It would take another two and half years before he would get to the finish line.

“Panini had an extraordinary mind and he built a machine unrivalled in human history. He didn’t expect us to add new ideas to his rules. The more we fiddle with Panini's grammar, the more it eludes us,” says Rajpopat. The 2,500-year-old algorithm decoded by him makes it possible, for the first time, to accurately use Panini’s so-called “language machine”.

Rajpopat’s discovery makes it possible to “derive” any Sanskrit word, to construct millions of grammatically correct words, using Panini’s revered language machine, which is widely considered to be one of the greatest intellectual achievements in history.

Panini’s system – 4,000 rules detailed in his renowned work, the Astadhyayi, which is thought to have been written around 500 BC – is meant to work like a machine. Feed in the base and suffix of a word and it should turn them into grammatically correct words and sentences through a step-by-step process. Until now, however, there has been a big problem. Often, two or more of Panini’s rules are simultaneously applicable at the same step leaving scholars to agonise over which one to choose. Solving so-called “rule conflicts”, which affect millions of Sanskrit words including certain forms of “mantra” and “guru”, requires an algorithm. Rajpopat’s research shows that Panini’s so-called language machine is also self-sufficient.

"My student Rishi has cracked it – he has found an extraordinarily elegant solution to a problem that has perplexed scholars for centuries. This discovery will revolutionise the study of Sanskrit at a time when interest in the language is on the rise,” said Professor Vincenzo Vergiani, Sanskrit professor and Rajpopat’s PhD supervisor. Six months before Rajpopat made his discovery, Professor Vergiani gave him some prescient advice: “If the solution is complicated, you are probably wrong”. A major implication of Rajpopat’s discovery is that now there is the algorithm that runs Panini's grammar, it could potentially teach this grammar to computers. "Computer scientists working on Natural Language Processing gave up on rule-based approaches over 50 years ago. So teaching computers how to combine the speaker’s intention with Panini’s rule-based grammar to produce human speech would be a major milestone in the history of human interaction with machines, as well as in India's intellectual history," said Rajpopat.

Sanskrit is an ancient and classical Indo-European language from South Asia. While only spoken in India by an estimated 25,000 people today, it has influenced many other languages and cultures around the world. “Some of the most ancient wisdom of India has been produced in Sanskrit and we still don’t fully understand what our ancestors achieved. We’ve often been led to believe that we’re not important, that we haven’t brought enough to the table. I hope this discovery will infuse students in India with confidence, pride, and hope that they too can achieve great things,” added Rajpopat.

<https://www.thehindu.com/news/national/indian-phd-student-at-cambridge-university-solves-2500-year-old-sanskrit-puzzle/article66267473.ece>

