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DRDO News

DRDO Technology News



Mon, 03 Apr 2023

India's World-Beating Akash and Very Short-Range Air Defense Missiles are Owner's Pride, Other's Envy

By Vijinder K Thakur

Earlier in the month, India's military research agency, Defense Research and Development Organization (DRDO), tested two VSHORADS (Very Short-Range Air-Defense System) missiles. The flight tests were the second development trial of the missile.

The two landmark events heralded DRDO's emergence as a short-range air defense missile technology world leader. The following is the technical assessment to back the view:

India Shows Sky Is The Limit With Akash Missile

The AWS is being inducted into the Indian Army as Short-Range Surface to Air Missile (SRSAM) system. This is the first India-developed SAM with an indigenous Radio Frequency (RF) seeker.

DRDO has developed ceramic radomes for metal-bodied missiles like Astra and QR-SAM (Quick Reaction SAM) and composite radome for AWS. DRDO claims its radomes have a better signal-to-noise ratio (around 0.7 dB) than foreign analogs (1.0 dB).

The AWS, which was earlier referred to as an Akash-1S in some reports, is an Akash-1 variant with an active Ku, X band RF seeker. The RCI-developed monopulse RF seeker is also used on the Astra BVR air-to-air missile and DRDO's QR-SAM AD missile.

The Akash-1 missile uses command guidance without terminal homing. Command guidance is jam resistant (because a powerful ground-based radar does target tracking) but becomes progressively inaccurate with an increase in range.

In the terminal phase of engagement (around the 30-km range for Akash), ground-based target and missile tracking resolution degrades to an extent where a successful intercept is ruled out. The AWS retains the jam-proof command guidance capability of the Akash-1 for the initial part of the flight but switches on its RF seeker for the end game. With a seeker lock, the missile is better assured of a kill at extended ranges. Short-range missiles typically lose energy when approaching limiting ranges because of motor burnout, constraining their ability to intercept maneuvering targets. Not the AWS, which is powered by a ramjet engine.

Besides being an active seeker, the AWS features other improvements over Akash — reduced footprint, 360° engagement capability, and ability to operate in extreme environments.

10 More VSHORADS Tests Before Finality

Unlike AWS, the development of the VSHORADS is yet to be completed. However, recent DRDO successes with missile development and the conceptually advanced features of the VSHORADS missile leave little room to doubt that the development of the missile will be successfully completed.

The VSHORADS missile was tested twice on September 27 at the Integrated Test Range at Chandipur in Odisha on India's East coast. It appears to have been developed as a substitute for the Russian Igla MANPAD by RCI, Hyderabad, in collaboration with other DRDO laboratories and Indian industry partners.

The missile, meant for neutralizing low-altitude aerial threats at short ranges, features an Imaging Infra-Red (IIR) seeker. A dual-thrust solid motor propels it.

Fitting a dual-thrust solid motor in a very short-range missile is an outstanding achievement. Thrust variation is achieved by tailoring the burning area, nozzle, rocket motor chamber, propellant type, and multiple propellant blocks.

A higher specific impulse is achieved post-launch by allowing the propellant to be ejected at a higher speed. The design of the missile, including the launcher, has been highly optimized to ensure easy portability. The missile has a length of two meters, a diameter of 0.09 meters, and a weight of 21 kg, and it incorporates technologies such as a miniaturized Reaction Control System (RCS) to increase mid-air maneuverability and integrated avionics.

During AeroIndia 2023, a DRDO official told Jane's that it had completed the development of the VSHORADS and the trials of the missile had started. VSHORADS will undergo "10 more trials in upcoming months".

Did DRDO Outdo Its Israeli Mentors?

Perhaps the Israeli SPYDER is the most outstanding quick-reaction short-range air defense system in the world today. The SPYDER-SR (Short Range) has a maximum interception range of 15 km and a max engagement altitude of 15 km.

The SPYDER-MR (Medium Range) has a greater operating range of 35 km and a max engagement altitude of 16 km due to the missiles being equipped with boosters. Both SPYDER systems comprise Derby and Python-5 air-to-air missiles adopted for ground launch.

The Derby missile features an active RF seeker and the Python-5, a dual-band IR seeker.

The SPYDER system is unique in using two missiles in any given mission. As such, a direct comparison between the DRDO's short-range missile systems and SPYDER systems would be an apples-and-oranges comparison.

However, DRDO'S VSHORADS is roughly equivalent to SPYDER's Python-5 missile, and DRDO's AWS is roughly equivalent to SPYDER's Derby missile. It can be objectively and correctly stated that the VSHORADS outperforms Python-5 in range, maneuverability, and seeker performance, and the AWS outperforms the Derby missile in range, maneuverability, seeker power, and jam resistance.

India's QRSAM Plugs Akash Missile Gaps

One weakness of AWS is its inability to react quickly. It needs to be moved and deployed before it can be used. The weakness is addressed by DRDO with its QR-SAM system, another short-range (25-30 km) area defense air defense system capable of search-on-move, track-on-move, and fire-on-short-halts while engaging multiple targets in ranges of about 30 km. Two vehicles are required for area air defense.

The system comprises a fully automated Command and Control System, Active Array Battery Surveillance Radar, Active Array Battery Multifunction Radar, and Launcher. Both radars are four-walled, having 360-degree coverage with search on-the-move and track-on-move capability.

The launcher vehicle features an electro-mechanical launcher capable of 360-degree rotation. The vehicles and launcher are home-built. The canister stored and launched, the single-stage solid propellant missile has a mid-course inertial navigation system with a two-way data link and terminal active seeker. It likely features a dual pulse motor.

DRDO developed the QR-SAM in response to an Indian Army challenge to produce a better system than the ones offered by foreign vendors.

The missile features an active seeker that uses X-Band Quad Transmit Receive Modules (QTRMs). A Two Way Data Link (TWDL) facilitates the missile's guidance. The QR-SAM system could eventually feature an indigenously developed optical system for passively acquiring targets. During AeroIndia 2023, a BEL official told Janes that the Indian Army had ordered five Quick Reaction Surface-to-Air Missile (QRSAM) weapon systems. BEL will deliver all five weapon systems to the Indian Army by 2024.

Conclusion

DRDO has made impressive technological strides in missile development. Its work has been particularly outstanding in developing short-range missiles. DRDO is clearly firing on all cylinders. If its offering of short-range air defense missiles is not the best in the world, it could well be in the near future.

<https://eurasianimes.com/aws-vshorads-successes-make-drdo-a-world-leader/>

Business Standard

Tue, 04 Apr 2023

India, Russia to Work on Developing Hypersonic Version of BrahMos: Report

National Security Advisor (NSA), Ajit Doval and his Russian counterpart Nikolai Patrushev met last week and discussed the possibilities of developing the hypersonic version of BrahMos or BrahMos-II missile, The Economic Times (ET) reported.

The two leaders discussed the supply of defence equipment from Russia and collaboration in the domain. The discussions were held on the sidelines of the Shanghai Cooperation Organisation (NSA) meets. The report said that the two senior officials discussed the possibility of joint development of an advanced version of the BrahMos missile.

The two NSAs met one-on-one and discussed a wide range of issues, including connectivity, payment mechanisms, security partnerships, and defence supplies from Russia that have been impacted by the Russia-Ukraine war, the report said.

Moscow has an edge over the US and other western powers when it comes to the development of hypersonic missiles, the report said. It is important to note that hypersonic missiles are considered a game changer in modern warfare. Hypersonic Weapons Systems (HWS) have attracted attention since the Russia-Ukraine war started.

If it becomes a reality, BrahMos-II could have the same capabilities as Russia's Tsirkon (Zircon) missile, the ET report said. CEO of BrahMos Aerospace, Atul Rane, had said last year that it was "possible" that BrahMos-II would carry some similarities with Russia's Tsirkon missile.

"The whole world is working on a hypersonic cruise missile. The US and China are developing hypersonic versions of their cruise missiles. But they do not have them yet. I have not seen anyone in the world having hypersonic cruise missiles. Russia says it tested the Tsirkon hypersonic antiship cruise missile developed by NPO Mashinostroyeniya," Rane told Russian news agency TASS last year.

Hypersonic weapon systems are advanced military technologies that can travel at speeds of Mach 5 or higher. Mach 1 defines the speed of sound. These weapons are designed to be extremely manoeuvrable and can change their trajectory quickly, evading enemy defences in the process.

The BrahMos is a supersonic cruise missile, developed by the joint Russian-Indian BrahMos Aerospace company. The first trial launch was conducted in 2001. Various versions of this missile have been commissioned by India's Navy, Air Force, and Army.

https://www.business-standard.com/india-news/india-russia-to-work-on-developing-hypersonic-version-of-brahmos-report-123040400274_1.html

Defence News

Defence Strategic : National/International



Press Information Bureau
Government of India

Ministry of Defence

Mon, 03 Apr 2023

Self-Reliance in Defence Manufacturing

Several policy initiatives and reforms have been taken by Government in the past few years to encourage indigenous design, development and manufacture of defence equipment, thereby promoting self-reliance in defence manufacturing in the country. These initiatives, inter-alia,

include according priority to procurement of capital items from domestic sources under Defence Acquisition Procedure (DAP)-2020; Notification of four 'Positive Indigenisation Lists' of total 411 items of Services and three 'Positive Indigenisation Lists' of total 3,738 items of Defence Public Sector Undertakings (DPSUs), for which there would be an embargo on the import beyond the timelines indicated against them; Simplification of Industrial licensing process with longer validity period; Liberalisation of Foreign Direct Investment (FDI) policy allowing 74% FDI under automatic route; Simplification of Make Procedure; Launch of Mission DefSpace; Launch of Innovations for Defence Excellence (iDEX) scheme involving start-ups & Micro, Small and Medium Enterprises (MSMEs); Implementation of Public Procurement (Preference to Make in India) Order 2017; Launch of an indigenisation portal namely SRIJAN to facilitate indigenisation by Indian Industry including MSMEs; Reforms in Offset policy with thrust on attracting investment and Transfer of Technology (ToT) for Defence manufacturing by assigning higher multipliers; and Establishment of two Defence Industrial Corridors, one each in Uttar Pradesh and Tamil Nadu; Opening up of Defence Research & Development (R&D) for industry, start-ups and academia with 25 percent of defence R&D budget; Progressive increase in allocation of Defence Budget of military modernization for procurement from domestic sources, etc. These policy initiatives have given a push to the growth of Industries including MSMEs in defence sector which have created tremendous employment opportunities. However, no employment data is maintained by Ministry of Defence. The information cannot be shared being strategic and sensitive in nature.

The Aatmanirbhar Bharat initiative has helped the country by encouraging indigenous design, development and manufacture of defence equipment in the country, thereby reducing dependency on imports in long run. The expenditure on defence procurement from foreign sources has reduced from 46% of overall expenditure in 2018-19 to 36.7% in December, 2022. Moreover, the Indian defence export has risen by more than eight times since 2016-17. In 2016-17, the defence exports were worth Rs 1,522 crore which has gone up to Rs 13,800 crore till date.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Shri Nalin Kumar Kateel and others in Lok Sabha today.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1913302>



Press Information Bureau
Government of India

Ministry of Defence

Mon, 03 Apr 2023

Indigenous Defence Production

With focus on Aatmanirbharta and efforts made to achieve self-reliance, the value of Defence Production has increased as follows in last three years:

Financial Year	Value of Defence Production
2019-2020	79,071
2020-2021	84,643
2021-2022	94,845

(Rs in crores)

Further, with consistent efforts in last few years, many significant projects including 155mm Artillery Gun system 'Dhanush', Advanced Towed Artillery Guns (ATAGs), Light Combat Aircraft 'Tejas', Surface to Air Missile system 'Akash', Main Battle Tank 'Arjun', T-90 Tank, T-72 Tank, Armoured Personnel Carrier 'BMP-II/IK', Su-30 MK1, Cheetah Helicopter, Advanced Light Helicopter, Dornier Do-228, High Mobility Trucks, INS Kalvari, INS Khanderi, INS Chennai, Anti-Submarine Warfare Corvette (ASWC), Arjun Armoured Repair and Recovery Vehicle, Bridge Laying Tank, Bi-Modular Charge System (BMCS) for 155mm Ammunition, Medium Bullet Proof Vehicle (MBPV), Weapon Locating Radar (WLR), Integrated Air Command and Control System (IACCS), Software Defined Radios (SDR), Lakshya Parachute for Pilotless Target Aircraft, Opto Electronic Sights for Battle Tanks, Water Jet Fast Attack Craft, Inshore Patrol Vessel, Offshore Patrol Vessel, Fast Interceptor Boat, Landing Craft Utility, 25 T Tugs, etc. have been produced in the country.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Shri Thomas Chazhikadan in Lok Sabha today.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1913304>



Press Information Bureau
Government of India

Ministry of Defence

Mon, 03 Apr 2023

Defence Industrial Corridor

Government of India has set up two Defence Industrial Corridors (DICs) in order to attract total investment worth Rs 20,000 crore by the year 2024-25 for defence industries, develop domestic supply chain and strengthen defence manufacturing ecosystem in the country. In Uttar Pradesh Defence Industrial Corridor (UPDIC), there are 06 nodes namely, Aligarh, Agra, Jhansi, Kanpur, Chitrakoot & Lucknow, and in Tamil Nadu Defence Industrial Corridor (TNDIC) 05 nodes namely, Chennai, Hosur, Coimbatore, Salem & Tiruchirappalli. Uttar Pradesh Expressways Industrial Development Authority (UPEIDA) is the nodal agency for UPDIC and Tamil Nadu Industrial Development Corporation (TIDCO) is the nodal agency for TNDIC. Both the States have promulgated their respective Aerospace & Defence Policy to attract investments in DICs.

As per available information, 108 Memorandum of Understanding (MoU) have been signed with industry/organisation in UPDIC having potential investment of Rs 12,191 crore. Investment of

Rs 2,445 crore has been made and 1611 Hectare of lands has been acquired so far for development of UPDIC. Further, in Tamil Nadu, arrangements have been made through MoUs etc with 53 industries for potential investment of Rs 11,794 crore. Investment worth Rs 3,894 crore has been made and 910 Hectare of land has been acquired so far for development of TNDIC. The DICs have been established to develop a holistic defence manufacturing ecosystem which is a progressive and ongoing process.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Shri Sanjay Singh in Rajya Sabha today.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1913301>



Press Information Bureau
Government of India

Ministry of Defence

Tue, 04 Apr 2023

India –Sri Lanka Annual Bilateral Maritime Exercise (SLINEX-23)

The 10th edition of IN-SLN bilateral maritime exercise SLINEX-23 is scheduled at Colombo from 03 - 08 April 2023. The exercise is being conducted in two phases: the Harbour Phase from 03-05 April 2023, followed by a Sea Phase from 06-08 April 2023. Indian Navy is being represented by INS Kiltan, an indigenous Kamorta class ASW corvette and INS Savitri, an Offshore Patrol Vessel. The Sri Lanka Navy is being represented by SLNS Gajabahu and SLNS Sagara. Maritime Patrol Aircraft, helicopters and Special Forces from both the sides would also participate in the exercise. The previous edition of SLINEX was conducted off Visakhapatnam from 07-12 March 2022.

SLINEX aims at enhancing interoperability, improving mutual understanding and exchanging best practices while jointly undertaking multi-faceted maritime operations. Professional, cultural and sporting events, as also social exchanges are planned during the harbour phase to further bolster the bonds of friendship and camaraderie between both the navies.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1913503>

mint

Mon, 03 Apr 2023

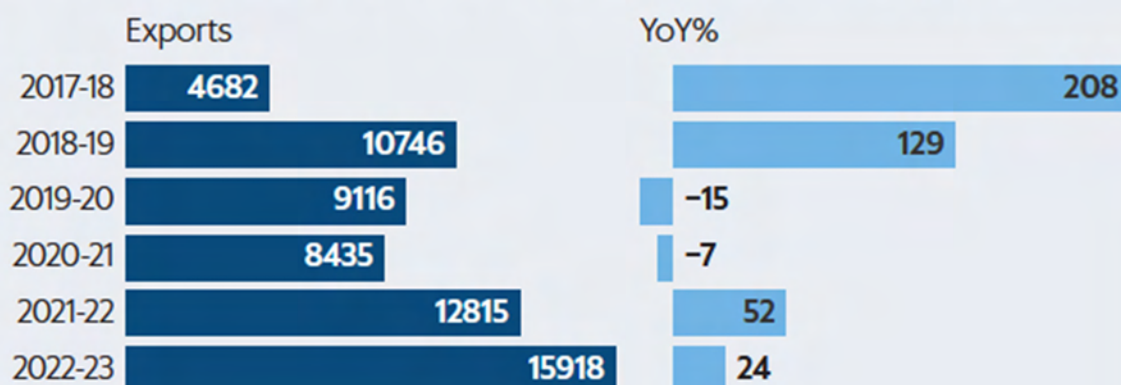
India's Defence Exports at Record High, but here's a Reality Check

By Manjul Paul

India's defence exports have increased tenfold in the last six years, showed a Mint analysis of Ministry of Defence data. Defence exports reached an all-time high of ₹15,918 crore in the fiscal year 2022-23, a 24% increase from the previous year's exports of ₹12,815 crore.

India's defence exports rose 24% in FY23, and tenfold in six years

India's defence exports (in Rs crore) and year-on-year change (%)



Includes only export by defence public sector undertakings.

Source: Ministry of Defence • [Get the data](#)

mint

This is, however, 54% short of the country's aim to achieve an annual export target of ₹35,000 crore by 2025, as per a statement made by Defence Minister Rajnath Singh last year. India's goal is to become a net exporter of defence equipment.

India's share in arms exports is very less and it was one of the top importers of defence supplies in the five years from 2018 to 2022, according to a report released last month by Stockholm International Peace Research Institute (SIPRI), a Sweden-based research institute on global security. India was one of the main arms suppliers to Myanmar during the same period.

According to the SIPRI report, India was not even among the top 25 countries with the largest share in arms exports, which means its share in the global arms exports was minuscule. The largest exporters from 2018 to 2022 were the US, Russia, France, China and Germany.

However, India was the largest importer of defence supplies, with a share of 11% of total global arms imports between 2018 and 2022. It has held its position as the largest arms importer since 1993.

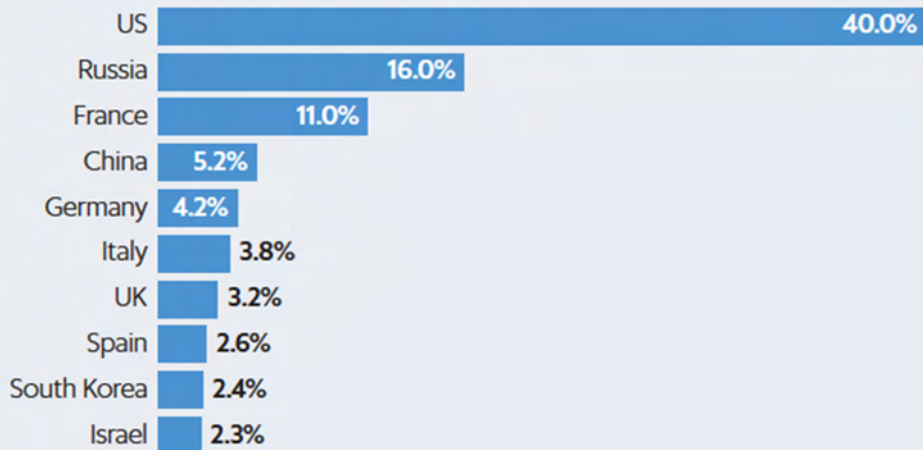
"India's tensions with Pakistan and China largely drive its demand for arms imports," noted the latest SIPRI report. According to the report, India retained its position even as its arms imports dropped by 11% between 2013-17 and 2018-22.

Russia was the largest supplier of arms to India in the last five years, providing 45% of its needs, followed by France (29%) and the US (11%).

The value of India's defence production fell by 28% in FY23, from roughly ₹95,000 to ₹68,000 crore, after rising in the preceding two years.

India's defence exports ranked well outside the top 25 countries during the period 2018-2022

Share (%) of largest arms exporters between 2018-2022

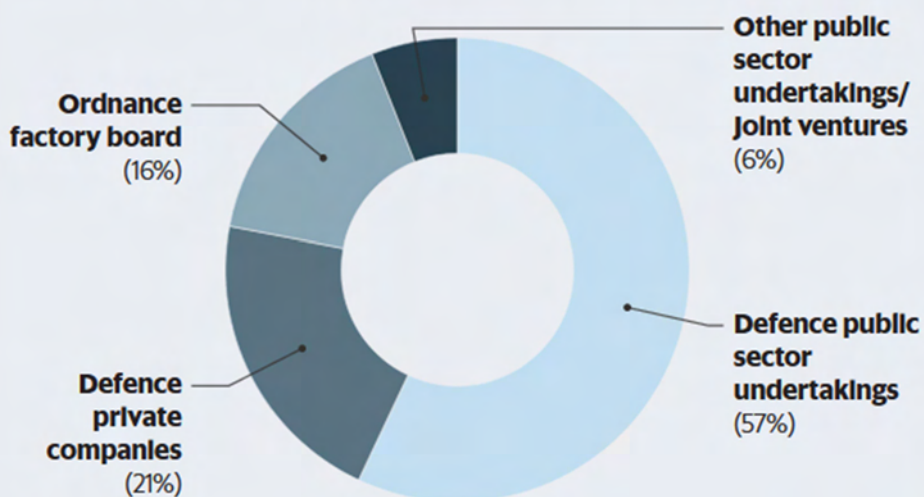


Source: Stockholm International Peace Research Institute • [Get the data](#)

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Despite years of privatization promotion, PSUs still make most of India's defence production

Sources of India's defence production in FY23, and their share (%)



Source: Ministry of Defence • [Get the data](#)

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Despite the push to privatize the defence sector in order to become self-reliant in terms of defence equipment, public sector enterprises continue to produce a majority of defence equipment (57%), but private companies are catching up (21%).

<https://www.livemint.com/news/india/in-charts-india-s-defence-exports-at-record-high-but-here-s-a-reality-check-11680538688592.html>



Tue, 04 Apr 2023

आईएनएस विक्रान्त पर हुआ 'नाइट लैंडिंग' का सफल परीक्षण, जून तक होगा ऑपरेशनल

देश के पहले स्वदेशी विमान वाहक पोत आईएनएस विक्रान्त पर पहली बार रात के समय कामोव 31 हेलिकॉप्टर उतार कर 'नाइट लैंडिंग' का सफल परीक्षण किया गया है। आईएनएस विक्रान्त पर किए गए सफलतापूर्वक परीक्षण ने साबित कर दिया कि यह रात के समय में सुरक्षित लैंडिंग कर सकता है।

*MAIDEN NIGHT LANDING OF HELICOPTER AT INS
VIKRANT (R11)#KA31 AEW FROM INAS 339 UNDERTOOK
TRIALS SUCCESSFULLY THEREBY PROVING NIGHT OPS
FROM VIKRANT. AS PART OF THE TRIALS, THE LIGHTING
AIDS & SHIPBORNE SYSTEMS WERE PROVEN FROM THE
CARRIER.#IADN PIC.TWITTER.COM/79ZR2ZPGOU*

*— INDIAN AEROSPACE DEFENCE NEWS (IADN)
(@NEWSIADN) APRIL 4, 2023*

सुरक्षा के लिहाज से है काफी अहम

सुरक्षा के लिहाज से नाइट लैंडिंग ट्रायल काफी महत्वपूर्ण है क्योंकि परीक्षण के दौरान स्वदेशी प्रकाश सहायक उपकरण और शिपबोर्न सिस्टम का इस्तेमाल किया गया, जो पूरी तरह सफल सिद्ध हुए। इससे पहले 6 फरवरी को 'एलसीए नेवी' की दिन में लैंडिंग और टेक ऑफ का

परीक्षण किया जा चुका है। लड़ाकू विमानों के परीक्षण पूरे होने के बाद आईएनएस विक्रान्त जून तक पूरी तरह से ऑपरेशनल हो जाएगा।

पिछले साल नौसेना में हुआ था शामिल

आईएनएस विक्रान्त को पिछले साल सितंबर में नौसेना में शामिल किया गया था लेकिन विमान वाहक पोत के डेक से लड़ाकू विमानों की लैंडिंग और टेक ऑफ का परीक्षण न होने से यह पूरी तरह से चालू नहीं था। इसलिए आईएनएस विक्रान्त पर फाइटर जेट लैंड और टेक ऑफ करने के परीक्षण शुरू किये गए। इसी क्रम में भारतीय नौसेना के पायलटों ने 6 फरवरी को आईएनएस विक्रान्त पर स्वदेशी हल्के लड़ाकू विमान 'एलसीए नेवी' को सफलतापूर्वक लैंड और टेक ऑफ करने का सफल परीक्षण किया। स्वदेश में ही निर्मित विमान वाहक पोत पर स्वदेशी लड़ाकू विमान संचालित करके भारत ने अपनी क्षमता का एक साथ अनूठा प्रदर्शन किया।

दिन में लैंडिंग का परीक्षण पहले ही हो चुका है

विमान वाहक पोत आईएनएस विक्रान्त पर दिन में लड़ाकू विमानों की लैंडिंग और टेक ऑफ के परीक्षण होने के बाद अब नाइट लैंडिंग का सफल ट्रायल किया गया है। आईएनएस हंसा से नेवल फ्लाइट टेस्ट स्क्वाड्रन के पायलटों और एयर टेक ऑफिसर की टीम ने आईएनएस 339 (फाल्कन्स) के कामोव 31 हेलिकॉप्टर की पहली नाइट लैंडिंग के साथ एक और कामयाबी हासिल की है। यह परीक्षण 28 मार्च को किया गया था, जिसका आधिकारिक तौर पर अब खुलासा किया गया है। सफलतापूर्वक परीक्षण में स्वदेशी विमान वाहक पोत से प्रकाश सहायक उपकरण और शिपबोर्न सिस्टम सिद्ध हुए। इसके साथ ही आईएनएस विक्रान्त से नाइट ऑपरेशन का संचालन किये जाने की भी शुरुआत हुई है।

आईएनएस विक्रान्त पर मिग-29 होंगे तैनात

आईएनएस विक्रान्त पर फिलहाल 12 मिग-29के तैनात किए जाने की संभावना है, लेकिन इस पोत के लिए भारत खुद स्वदेशी जुड़वां इंजन वाले डेक-आधारित लड़ाकू (TEDBF) विकसित करेगा। नौसेना इस परियोजना पर रक्षा अनुसंधान विकास संगठन (DRDO) और वैमानिकी विकास एजेंसी के साथ काम कर रही है। TEDBF का पहला प्रोटोटाइप 2026 के आसपास तैयार होने की संभावना है और इसका उत्पादन 2032 तक शुरू हो सकता है। चूंकि TEDBF अभी भी एक दशक दूर है, इसलिए नौसेना विकल्प के तौर पर 26 लड़ाकू विमानों को खरीदने पर विचार कर रही है।

<https://newsonair.com/hindi/2023/04/04/successful-test-of-night-landing-on-ins-vikrant-will-be-operational-by-june/>

Air Force to Carry out First Firing of S-400 Air Defence Missiles soon

The Indian Air Force is planning to carry out the first firing of its most potent S-400 air defence missile system, very soon to prove the capabilities of the system acquired a few years ago.

The Indian Air Force has signed a contract with Russia to acquire 5 squadrons of the S-400 air defence system and had carried out its firings only in Russia during the trials there.

"To prove the capabilities of the system, the first firing of the air defence system is planned to be held very soon against a fast, moving, aerial target," top defence sources told India today.

The first two squadrons have already been operationalised in the northern and eastern sectors respectively and have taken part aerial exercises too, they said. The ISF has received three squadrons along with the simulators in recent times.

The system with its missiles of different range can take on enemy ballistic and cruise missiles, fighter aircraft and unmanned aerial vehicles flying at distances up to 400 kilometres. "Delivered S-400 to India on time regardless of US pressure," Russia said.

India has signed a deal worth over Rs 35,000 crore to acquire five squadrons of the S-400 air defence missiles from Russia over three years and deliveries of all units are expected to get over by next financial year.

The S-400 is believed to be a game changer by the Indian Air Force, which has strengthened itself in terms of air defence capabilities in a big way in the last few years with the arrival of the indigenous MR-SAM and Akash missile systems along with the Israeli Spyder quick reactions surface to air missile systems.

<https://www.indiatoday.in/india/story/air-force-to-carry-out-first-firing-of-s-400-air-defence-missiles-very-soon-2355768-2023-04-04>

अमर उजाला

अमेरिका से हेलफायर मिसाइल खरीदेगा भारत, कुख्यात आतंकी अल जवाहिरी को इसी से किया गया था खत्म

भारत अपनी नौसेना के लिए अमेरिका के साथ 30 करोड़ डॉलर (लगभग 2,400 करोड़ रुपये) के हथियारों के सौदे पर वार्ता के अंतिम चरणों में है। इस सौदे के तहत भारत अपनी नौसेना के

एमएच-60 रोमियो हेलिकॉप्टर के लिए अमेरिका से हेलफायर मिसाइल और मार्क 54 पनडुब्बी रोधी टॉरपीडो समेत अन्य हथियार खरीदेगा।

2020 में हुआ था 24 हेलिकॉप्टरों का सौदा

भारतीय नौसेना ने 2020 में अमेरिकी कंपनी लॉकहीड मार्टिन के साथ फास्ट-ट्रैक प्रक्रियाओं के तहत 24 एमएच-60 रोमियो हेलिकॉप्टर खरीदने के लिए दो अरब डॉलर (लगभग 16,000 करोड़ रुपये) का सौदा किया था। अब इन हेलीकॉप्टरों को संचालन के लिए हथियारों से लैस किया जाना है। रक्षा मंत्रालय के अधिकारियों ने इस बारे में बताया।

कुख्यात आतंकी अल जवाहिरी का हेलफायर से हुआ था खात्मा

गौरतलब है कि हेलफायर मिसाइल एक सटीक-निर्देशित मिसाइल है। इसका इस्तेमाल अमेरिकी सेनाओं ने अल जवाहिरी जैसे प्रमुख इस्लामी आतंकवादियों को मारने के लिए किया था। यह मिसाइल अन्य मिसाइलों की तरह विस्फोट नहीं करती। बल्कि, इसके अंदर से चाकू जैसे ब्लेड्स निकलते हैं, जो टारगेट पर सटीक निशाना लगाते हैं। हेलफायर मशीन को काफी घातक और टारगेट पर सटीक निशाना बनाने के लिए ही पहचाना जाता है। इससे आस-पास के लोगों को कोई चोट नहीं पहुंचती है।

वहीं, पनडुब्बी रोधी MK 54 लाइटवेट टॉरपीडो का उपयोग अमेरिकी सतह के जहाजों, फिक्स्ड-विंग एयरक्राफ्ट और हेलीकॉप्टरों द्वारा किया जाता है। यह उनका प्राथमिक एंटी-सबमरीन वारफेयर हथियार है। यह पहले से ही भारतीय नौसेना के P-8I पनडुब्बी रोधी युद्ध और निगरानी विमानों में शामिल हेलिकॉप्टरों को पनडुब्बी रोधी भूमिका के साथ-साथ जहाज रोधी कार्यों और समुद्र में खोज और बचाव कार्यों के संचालन के लिए डिज़ाइन किया गया है।

<https://www.amarujala.com/india-news/india-moves-closer-towards-usd-300-million-weapons-deal-with-us-for-its-navy-2023-04-03>



Tue, 04 Apr 2023

Germany Expected to Present Government-to-Government Proposal for Sale of Submarines to India

Germany is soon expected to present a proposal to India for the sale of advanced conventional submarines through the government-to-government route, it is learnt. The Navy, which is staring at a dwindling sub-surface fleet, is looking to procure six advanced diesel-electric submarines under Project-75I estimated to cost over ₹45,000 crore. The project has been stuck for a while over technical issues.

“A proposal for submarines through the G-to-G route is being prepared and would be presented to the Government of India soon,” diplomatic sources said.

A visit by German Defence Minister to India in the next few months is in the works, officials and diplomatic sources said, during which the proposal could be formally presented.

The issue also came up for discussion during the visit of German Chancellor Olaf Scholz in February, officials said.

In January 2020, the Defence Acquisition Council (DAC) shortlisted Mazgaon Docks Ltd. (MDL) and Larsen & Toubro (L&T) as the Indian partners for the P-75 deal, the first to be processed under the strategic partnership model of the procurement procedure.

The five foreign original equipment manufacturers (OEM) are Daewoo Shipbuilding & Marine Engineering (South Korea), Naval Group (France), Navantia (Spain), Rosoboronexport (Russia) and Thyssenkrupp Marine Systems (TKMS, Germany).

The Request For Proposal (RFP) was originally issued in July 2021 to MDL and L&T with 12 weeks to respond and has since been extended several times, the latest being up to August 2023.

The project ran into rough weather, among other issues, over a specification that the submarine on offer should have an operational Air Independent Propulsion (AIP) module with an endurance of two weeks.

The OEMs also raised the issue of unlimited liability on them. Only Germany and South Korea technically meet this criteria, as reported by The Hindu earlier.

The DAC recently clarified a few issues, officials said. However, industry sources said concerns still remain. Recently, TKMS, which was in talks with L&T, decided to partner with MDL, while it is learnt that Daewoo has internal administrative issues, among others. Officials said due to this, it could end up being a single- vendor situation, stalling the entire process.

Officials had stated that once a selection was done, the deal had to be eventually processed through an Inter-Governmental Agreement, given the technical complexities involved.

The Navy has 16 conventional submarines in service — seven Russian Kilo-class submarines, four German-origin HDW submarines and five French Scorpene-class submarines.

The last and sixth Scorpene is expected to join service early next year. With the Kilos and the HDWs ageing, a Medium Refit-cum-Life Certification (MRLC) programme is under way to increase their life, but even that would not arrest the dwindling sub-surface fleet of the Navy.

An AIP module acts as a force multiplier as it enables conventional submarines to remain submerged for a longer duration, thereby increasing their endurance and reducing chances of detection.

An indigenously developed AIP module is set to be installed on the Scorpene submarines as they go for refit from 2024 onwards.

<https://www.thehindu.com/news/national/germany-expected-to-present-government-to-government-proposal-for-sale-of-submarines-to-india/article66699154.ece>

India-U.S. Air Exercise ‘Cope India’ to Begin Next Week, Japan to be Observer

Continuing the military-to-military engagement, the Air Forces of India and the U.S. are set to conduct the Cope India exercise from April 10 to 21 at the Kalaikunda airbase in West Bengal, with Japan as an observer.

The exercise will see intense air manoeuvres aimed at improving interoperability, a defence source said.

The Indian Air Force (IAF) is set to field its frontline fighters SU-30MKI, Rafale and the indigenous Light Combat Aircraft along with force multipliers, while the U.S. Air Force is expected to bring in F-15 fighter jets.

The Japanese Air Self Defence Force (JASDF) participated in Cope India as an observer for the first time in December 2018 based on the Agreement of Defence Ministerial Meeting on August 20, 2018.

As was reported by The Hindu then, the U.S. proposed a trilateral air exercise between the three countries and so Japan was included as an observer with the intention to elevate it into trilateral level in phases.

The India-U.S. bilateral Malabar naval exercise became trilateral with the edition of Japan in 2015 and further brought in all the Quad partners together with the inclusion of Australia in 2020. In January this year, India and Japan held the maiden air exercise Veer Guardian hosted by the JASDF.

The armed forces had a hectic exercise so far this year, both bilateral and multilateral. Last month, the IAF for the first time joined the multilateral Ex Cobra Warrior hosted by Royal Air Force in the U.K.

<https://www.thehindu.com/news/national/india-us-air-exercise-cope-india-to-begin-next-week-japan-to-be-observer/article66695542.ece>

मिलिट्री रोबोटिक्स शुरू हुई रोबॉट वॉर

दुनिया भर में सैनिकों की जगह रोबॉट शामिल करने की होड़ बढ़ रही है। 2023 की मिलिट्री रोबॉट्स ग्लोबल मार्केट रिपोर्ट के मुताबिक इस साल इसका कारोबार \$20 बिलियन से भी ज्यादा का होगा। LAC पर टेंशन के बाद भारत ने भी इस मार्केट को बड़ा ऑर्डर दिया है, तो खबर है कि चीन ने वहां ऑलरेडी रोबॉट सोल्यूज लगा रखे हैं। देखते हैं, क्या है दुनिया भर की मिलिट्री में रोबॉट आर्मी का हाल।

कमर कसता इंडिया

- DRDO बना रहा सामान ढोने वाले और हथियारबंद रोबॉट।
- J&K में बारूदी सुरंगों नष्ट करने में इस्तेमाल हो रहे स्वदेशी रोबॉट।
- राइफल धारी 'रोबॉट सोल्यूज' बना रहा DRDO।
- पेट्रोलिंग कर रहा रोबॉट- साइलेंट संतरी।
- खुद चार्जिंग पॉइंट तक जाकर खुद को चार्ज लेता है चार्ज।

3D प्रिंटेड रोबॉट है साइलेंट संतरी, 5-6 रोबॉट की है फैमिली।



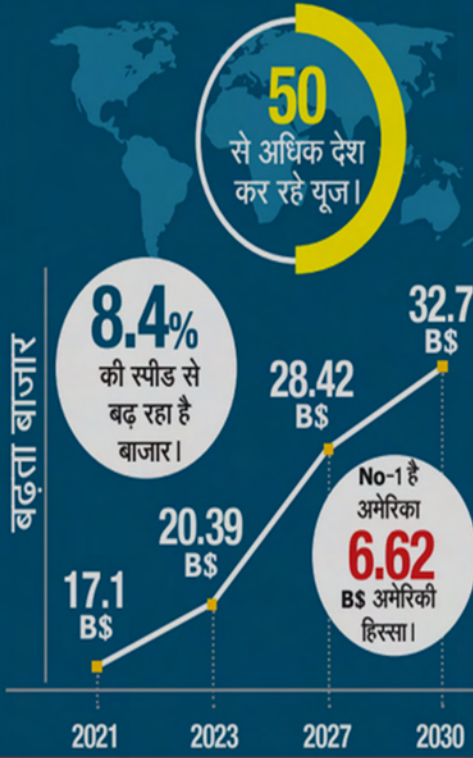
100

रोबॉटिक खच्चर की निविदा जारी।

194

भारतीय स्टार्ट-अप कर रहे AI डिवेलपिंग।

मिलिट्री रोबॉटिक्स रिपोर्ट 2023



हाई डिमांड रोबॉट्स



माइन क्लीयरेंस



सर्च एंड रेस्क्यू



अटैकिंग रोबॉट्स



सर्विलांस



बम डिस्पोजल



फायर फाइटिंग



ट्रांसपोर्ट

LAC पर चीन

- 2017 से LAC पर रोबॉटिक्स की नई AI योजना शुरू।
- 2022 में बनाया सबसे बड़ा मिलिट्री भारवाहक रोबॉट।
- बड़ी संख्या में AI आधारित UAV लगीं LAC पर।
- वॉइस कमांड और चेहरा पहचान कर काम करते हैं रोबॉट।

लक्षांश वाले हिस्से में **88** जगह मशीन गन से लैस क्रॉल रोबॉट्स।

200 Kg भार उठाने वाले 200 रोबॉट खच्चर तैनात।

युद्ध में रोबॉट्स

किसी भी हथियार की असली टेस्टिंग युद्ध में ही होती है। रूस-यूक्रेन युद्ध में मिलिट्री रोबॉट्स भी टेस्ट किए जा रहे हैं-



- रूस के दो युद्धक रोबॉट्स उत्तर पूर्व यूक्रेन में देखे गए हैं, खारकीव में स्वातंत्र्य दिखा।
- रूस का बैटल टैंक रोबॉट मार्कर UGV अमेरिका के अब्राहम और जर्मनी के लेपर्ड का जवाब है।
- मार्कर का अपग्रेडेड वर्जन बना रहा है रूस, होगा सबसे खतरनाक।
- नैटो के पास भी हैं किलर रोबॉट्स।
- सीरिया और अफगानिस्तान में भी किलर रोबॉट्स का इस्तेमाल।
- 2030 तक ब्रिटेन भी मार्केट में लाएगा किलर रोबॉट्स।

महाबलशाली

नाम	देश	स्पेशलिस्ट
सेटोर	US	खोजी रोबोट, लैंडमाइन का पता लगाना, डिफ्यूज, एक्सप्लोसिव फिट करना
मट्ट	US	भारवाहक, Up To 544KG, 96KM सिंगल चार्जिंग
अवतार-3	US	सिक्वॉरिटी रोबोट, लॉन्ग रेंज सर्विलांस
सफायर	US	ह्यूमनॉयड रोबोट, डैमेज इन्स्पेक्टर
डोगो	इराक़	9mm की पिस्टल, सशस्त्र कमांडो



मिलिट्री अफेयर्स में जो क्रांति आ रही है, उसके केंद्र में इमर्जिंग टेक्नॉलजी है जिसमें रोबोटिक्स बहुत बड़ा रोल प्ले कर रहा है। भारत को भी इसे काफी गंभीरता से लेना होगा।
- हर्ष वी. पंत, डिफेंस एक्सपर्ट



बड़ी कंपनियां

लॉकहीड मार्टिन, नॉर्थ्रॉप ग्रुममैन, जनरल डायनामिक्स, बीएई सिस्टम्स, एयरोविरोन्मेंट, आईरोबोट, बोस्टन डायनामिक्स, थेल्स ग्रुप।

बड़े खिलाड़ी

अमेरिका, चीन, रूस, ऑस्ट्रेलिया, फ्रांस, जर्मनी, जापान, इंडोनेशिया, साउथ कोरिया, ब्रिटेन, भारत।

कंटेंट: अरुणेश पठानिया

ग्राफिक्स: राजीव विरवकर्मा



क्या चीन की ओर से रोबोट संभलेंगे युद्ध का मोर्चा? इस पर लेख पढ़ने के लिए यहाँ स्कैन करें और navbharatgold.com पर जाएं

THE TIMES OF INDIA

Mon, 03 Apr 2023

Russia to Place Nuclear Weapons near Belarus' Borders with NATO

Russia will move its tactical nuclear weapons close to the western borders of Belarus, the Russian envoy to Minsk said on Sunday, placing them at NATO's threshold in a move likely to further escalate Moscow's standoff with the West. In one of the Russia's most pronounced nuclear signals since the beginning of its invasion of Ukraine 13 months ago, President Vladimir Putin said on March 26 that Russia will station tactical nuclear weapons in Belarus.

The two Slav neighbours are formally part of a "union state" and have been in talks for years to integrate further, a process that has accelerated after Minsk allowed Moscow to use Belarusian territory to send troops into Ukraine last year.

The weapons "will be moved to the western border of our union state and will increase the possibilities to ensure security," Russian ambassador to Belarus, Boris Gryzlov, told Belarusian state television.

"This will be done despite the noise in Europe and the United States."

Gryzlov did not specify where the weapons will be stationed, but confirmed that a storage facility will be completed, as ordered by Putin, by July 1 and then moved to the west of Belarus.

Belarus borders to the north with Lithuania and Latvia and to west with Poland, all part of NATO's Eastern flank that has been bolstered with additional troops and military equipment following Russia's invasion of Ukraine.

The U.S. and Kyiv's other allies have said they were concerned about the possibility that Russia would send tactical nuclear weapons to Belarus, with President Joe Biden saying it was "worrisome."

President Alexander Lukashenko said on Friday that Belarus would also allow Russia to put intercontinental nuclear missiles there too if necessary.

<https://timesofindia.indiatimes.com/world/europe/russia-to-place-nuclear-weapons-near-belarus-borders-with-nato/articleshow/99197883.cms>

THE TIMES OF INDIA

Mon, 03 Apr 2023

Chinese Spy Balloon gathered Information from Sensitive US Military Sites: Report

A Chinese spy balloon that flew across the US was able to gather intelligence from several sensitive American military sites and transmit it back to Beijing in real-time, despite the Biden administration's efforts to block it, a media report said on Monday.

A suspected Chinese spy balloon said to be the size of three buses, was spotted over the airspace of the United States in late January.

China was able to control the balloon so it could make multiple passes over some of the sites (at times flying figure-eight formations) and transmit the information it collected back to Beijing in real time, NBC News reported, quoting three unnamed officials.

The intelligence China collected was mostly from electronic signals, which can be picked up from weapons systems or include communications from base personnel, rather than images, the officials were quoted as saying in the report.

The three officials said China could have gathered much more intelligence from sensitive sites if not for the Biden administration's efforts to move around potential targets and obscure the balloon's ability to pick up their electronic signals by stopping them from broadcasting signals, the report said.

The balloon first entered US airspace from Alaska on January 28, according to the Biden administration.

Over the next four days, it was flying over the Malmstrom Air Force Base in Montana, where the US has some of its nuclear assets.

The development further strained the already tense bilateral ties between the US and China, with the US Secretary of State Antony Blinken abruptly postponing his key visit to Beijing in February this year.

The US National Security Council has referred NBC News to the defence department for comment. In its response, Beijing maintained that the balloon was a Chinese "civilian airship"

which had deviated from its planned route. "The airship is from China. It is a civilian airship used for research, mainly meteorological purposes," the spokesperson of the Chinese foreign ministry said in a statement posted on the Chinese foreign ministry's website.

On February 4, the US shot down the balloon off the coast of South Carolina.

"This afternoon, at the direction of President Biden, US fighter aircraft assigned to US Northern Command successfully brought down the high altitude surveillance balloon launched by and belonging to the People's Republic of China over the water off the coast of South Carolina in US airspace," Defence Secretary Lloyd Austin had said.

US officials said they tried to reconstruct the balloon from the debris recovered.

<https://timesofindia.indiatimes.com/world/china/chinese-spy-balloon-gathered-information-from-sensitive-us-military-sites-report/articleshow/99217504.cms>

The Tribune

Tue, 04 Apr 2023

France Announces \$450 Bn Defence Budget as Emmanuel Macron heads to Beijing

The French government on Tuesday approved a key budget bill presented as the country's biggest military spending spree in more than 50 years, underscoring the impact of Russia's ongoing conflict with Ukraine.

The bill foresees 413 billion Euros (USD 450 billion) in military spending for the period covering 2024-2030 — up by more than a third relative to the previous timeframe. Defence Minister Sebastien Lecornu said bill's political, budgetary, military and technological drive is comparable to the huge push in the 1960s that saw France develop nuclear weapons, making the country one of the world's major military powers.

Championed by French President Emmanuel Macron, the bill would notably modernise France's nuclear arsenal, boost intelligence spending by 60 per cent, double the number of military reservists, reinforce cyberdefence and develop more remote-controlled weapons.

<https://www.tribuneindia.com/news/world/france-announces-450-bn-defence-budget-as-emmanuel-macron-heads-to-beijing-494337>



Mon, 03 Apr 2023

Philippines Announces Four more Military Bases U.S. Troops can Use

The Philippines announced on April 3 the location of four additional military bases to be used by U.S. troops, with one site near the hotly disputed South China Sea and another not far from

Taiwan. The longtime treaty allies agreed in February to expand cooperation in "strategic areas" of the Philippines as they seek to counter China's growing assertiveness over self-governed Taiwan and the building of Chinese bases in the South China Sea.

The 2014 Enhanced Defence Cooperation Agreement, known as EDCA, gave U.S. forces access to five Philippine bases. It was expanded to nine, but the locations of the four additional bases were withheld until Monday while the government consulted with local officials.

The four sites had been assessed by the Philippine military and deemed "suitable and mutually beneficial", the Presidential Communications Office said in a statement. It said the bases would also be used for humanitarian and relief operations during disasters.

A U.S. official confirmed that the locations announced by the palace were the new EDCA sites.

Three of the sites are in the northern Philippines, including a naval base and airport in Cagayan province and an army camp in the neighbouring province of Isabela, the Philippine statement said. The naval base at Cagayan's Santa Ana is about 400 kilometres (250 miles) from Taiwan.

Another site will be an air base on Balabac Island, off the southern tip of Palawan Island, near the South China Sea. Cagayan Governor Manuel Mamba has publicly opposed having EDCA sites in his province for fear of jeopardising Chinese investment and becoming a target in a conflict over Taiwan. But Philippine acting defence chief Carlito Galvez told reporters recently the government had already decided on the sites and that Mamba had agreed to "abide with the decision". The agreement allows U.S. troops to rotate through the bases and also store defence equipment and supplies at them.

The pact stalled under former President Rodrigo Duterte, who favoured China over the Philippines' former colonial master.

But President Ferdinand Marcos, who succeeded Mr. Duterte in June, has adopted a more US-friendly foreign policy and has sought to accelerate the implementation of the EDCA.

Mr. Marcos has insisted he will not let Beijing trample on Manila's maritime rights. While the Philippine military is one of the weakest in Asia, the country's proximity to Taiwan and its surrounding waters would make it a key partner for the United States in the event of a conflict with China.

Beijing has been critical of the agreement, which its embassy in the Philippines said recently was part of "U.S. efforts to encircle and contain China through its military alliance with this country".

The Chinese embassy did not respond immediately to a request for comment.

The United States has a long and complex history with the Philippines.

They share a decades-old mutual defence treaty, but the presence of U.S. troops in the Southeast Asian country remains a sensitive issue.

The United States had two major military bases in the Philippines but they were closed in the early 1990s after growing nationalist sentiment.

U.S. troops return to the Philippines every year for joint military exercises, including Balikatan, which kicks off next week. With more than 17,000 soldiers taking part, it will be the largest yet.

<https://www.thehindu.com/news/international/philippines-announces-four-more-military-bases-us-troops-can-use/article66695154.ece>



Tue, 04 Apr 2023

Japan: Defence Firms Unveil High Energy Laser Welding Anti-Drone Weapons

In a first, two Japanese firms recently unveiled their respective laser systems which will be used to shoot down incoming unmanned aerial vehicles (UAVs) or drones, reported the United States-based online newspaper The Diplomat.

This comes amid concerns about an increased presence of Chinese and Russian militaries near Japan which has seemingly prompted Tokyo to ramp up investment in such technology.

The companies in question are the Japan-based Mitsubishi Heavy Industries (MHI) and Kawasaki Heavy Industries (KHI) who displayed this technology at the DSEI Japan 2023 show, held in Chiba Prefecture.

Mitsubishi Heavy Industries' 10-kilowatt laser system

A video by MHI shows the 10-kilowatt (kilowatt) fibre laser shooting down drones at a distance of at least 1.2 kilometres within two to three seconds. The officials from the company also plan to deliver the prototype to the Japanese Ministry of Defense (MoD) in December, as per The Diplomat. Speaking about the lasers' features, MHI also said the Counter-Unmanned Aircraft Systems (C-UAS) can be fitted onto ground vehicles for mobility and also utilised by the land bases of the Maritime and Air Self-Defense Forces. "Any Self-Defense Force can use it from the ground as long as it is intended to shoot down flying objects," said an MHI official, as quoted by the Washington-based newspaper.

When asked about the laser system's capabilities to intercept incoming missiles an official said that while they have not conducted a "high level of research in-house", it may be possible by increasing the output energy.

In 2021, the Japan-based firm also signed a \$6 million contract with the MoD's Acquisition, Technology, and Logistics Agency (ATLA) to build a prototype of a vehicle-mounted high-power laser demonstration device.

Kawasaki Heavy Industries' 100-kW and 2-kW laser system

On the other hand, KHI has been developing a more powerful 100-kilowatt vehicle-mounted laser system, reported the Diplomat. According to KHI officials, their device in the two-kilowatt laser prototype can eliminate UAVs at the range of several 100 metres.

Additionally, both their two-kilowatt and 100-kilowatt laser systems use the same one-micrometre band fibre laser. The system detects a drone with an infrared (IR) camera, tracks it down and then shoots it with the laser, said the report citing officials.

According to the media report one of their prototypes has already been sent to the ATLA earlier this year and will begin tests and evaluation this month. In 2021, the KHI was allocated around \$21 million from the MoD budget for demonstration costs of the vehicle-mounted laser system, reported The Diplomat. Notably, KHI's 100-kilowatt laser system would be mounted on a

larger, trailer-type vehicle given the increased power output of the lasers which require a large power supply and cooling water circulation system.

<https://www.wionews.com/world/japan-defence-firms-unveil-high-energy-laser-wielding-anti-drone-weapons-578764>



Mon, 03 Apr 2023

SOFINS 2023: Safran Debuts Navkite Autonomous Maritime Navigation System

Safran unveiled its Navkite maritime navigation system at the SOFINS 2023 defence exhibition, held near Bordeaux, France.

Navkite has been co-developed with input from French naval special forces and is an autonomous positioning, navigation, and timing (PNT) system, combining Safran's Geonyx M inertial navigation system (INS); a VersaSync Global Positioning System (GPS) master clock and network time server; a pair of lead onboard lead batteries; and a tablet designed to display a graphical user interface. It is designed to work in tandem with an external global navigation satellite services (GNSS). The system is watertight and designed to be corrosion resistant, it is fitted inside a hardened case with a total weight of approximately 25 kg. When running on internal power, the system has approximately 10 hours of battery life. However, the Navkite case has sockets that enable it to be connected to an external power source. The VersaSync system is used to detect potential jamming or spoofing of GNSS signals. If the signal reliability falls under certain preset parameters, Navkite will switch off the GNSS function and rely solely on the INS until the VersaSync deems that the signal reliability has increased enough to re-engage the GNSS function.

<https://www.janes.com/defence-news/defence/latest/sofins-2023-safran-debuts-navkite-autonomous-maritime-navigation-system>

Science & Technology News



Mon, 03 Apr 2023

G20 Science Conference on Clean Energy for Greener Future begins in Agartala

Under India's G20 presidency, the two-day Science20 (S20) Conference is underway at Agartala in Tripura. The S20 Meet is being held from April 3 to 4, 2023. "This is an especially important

moment for us as we are faced with unprecedented environmental issues that require immediate action if we want to make meaningful progress towards achieving a more sustainable future for generations to come,” remarked Ajay Kumar Sood, Principal Scientific Adviser of India.

Around 70 national and international delegates have gathered in Agartala for the Science20 conference. The conference will carry forward the discussions from the Science 20 inception meeting that happened in Puducherry, Kerala.

Clean Energy for Greener Future

Science20 is an engagement group of the G20 that brings the global science community together on one platform. The theme of the S20 Conference is “Clean Energy for Greener Future”. The conference seeks to find environment-friendly solutions for a greener future.

Green Solution

Through this conference, the Science20 engagement group aims to encourage common sharing of space, openness in terms of intellectual property, and smoother technology transfer among G20 countries to help address energy poverty.

At its most basic level, disruptive science seeks to identify new ways of tackling existing problems by leveraging emerging technologies or taking advantage of previously unexplored opportunities presented by existing ones. The conference will bring together experts, policymakers, and stakeholders from various fields to discuss and share ideas on how to achieve sustainable development through clean energy. It also aims to promote international cooperation and collaboration in the field of clean energy research and development.

Blue Energy

One of the key sessions at the S20 Conference on April 3 was based on ‘Ocean Energy’. Ocean Energy is an essential research area that should be focused on for global clean energy initiatives. Prof. Madhavan Nair Rajeevan’s presentation on the ‘global potential of ocean energy’ showcased how harnessing the power of ocean waves and tides can provide a sustainable source of clean energy. The session highlighted the need for further research and development in this area to unlock the full potential of blue energy.

Dr. Ashish Lele, Director, National Chemical Laboratory, Pune, also gave a presentation on ‘Green Hydrogen for Cleaner Future’ at the S20 Conference.

<https://newsonair.com/2023/04/03/g20-science-conference-on-clean-energy-for-greener-future-begins-in-agartala/>



Tue, 04 Apr 2023

Artemis 2: Meet the 4 Astronauts NASA Selected for the First Crewed Moon Mission since Apollo

NASA has announced the four astronauts that will go to the lunar orbit and come back with the Artemis 2 mission—mission commander Reid Wiseman, Victor Glover, Canadian Space Agency astronaut Jeremy Hansen and NASA mission specialist Christina Koch.



NASA Artemis 2 crew: (L-R): Mission commander Reid Wiseman, pilot Victor Glover, CSA's Jeremy Hansen and mission specialist Christina Koch. (Image credit: NASA)

“We are going,” said NASA administrator and former astronaut Bill Nelson as he began his address during the space agency’s announcement of the four astronauts. The event was live-streamed on NASA’s website on Monday.

“We will unlock new knowledge and understanding. We have always dreamed about what more is ahead. Why? Because it is in our DNA. It is part of us. It is who we are, as adventurers, as explorers, as frontiers people,” added Nelson.

Who are these Artemis 2 astronauts?

NASA’s Reid Wiseman will be the commander of the Artemis 2 mission. Wiseman previously lived and worked on the International Space Station in 2014. Before that, he commanded the undersea research mission NEEMO21, a 16-day underwater mission that simulated space exploration. He also served as chief of NASA’s astronauts in the past.

Victor Glover will serve as the pilot for Artemis 2, navigating Orion around the Moon. Glover was previously the pilot of NASA’s SpaceX Crew-1 mission. According to the space agency, he has logged over 3,000 flight hours in more than 40 different aircraft.

Jeremy Hansen will represent the Canadian Space Agency during the mission, and he was a fighter pilot before joining the space agency. He has worked with NASA on astronaut training and mission operations, but this will be his first mission in space.

NASA astronaut Christina Koch will be the mission specialist for Artemis 3. Koch visited the space station in 2019, where she was part of the first all-woman spacewalk in history. She began her career as an electrical engineer at NASA’s Goddard Space Flight Center.

What will happen during the Artemis 2 mission?

The Artemis 1 mission allowed NASA to test the foundations of its latest human space exploration capabilities. This included the Space Launch System (SLS) rocket, Orion spacecraft, and all associated ground systems. Artemis 2 will be the first crewed mission to test all this.

The 10-day-long mission will have the four astronauts flying around the Moon to test Orion and its life-support missions to ensure that it can provide a safe habitat that will allow astronauts to live and work during deep space missions.

The initial launch will be similar to what happened during the Artemis 1 mission. After that, the Orion spacecraft and the SLS's upper stage (ICPS or the interim cryogenic propulsion stage) will orbit Earth twice. They do this to ensure that all of Orion's systems are working fine while it is still close to our planet.

After this, the Orion spacecraft will travel to about 10,300 kilometres past the far side of the Moon. From this vantage point, the astronauts will be able to see both the Moon in the foreground and the Earth in the distant background.

Then, Orion will take advantage of the Earth-Moon gravity field to bring itself back to our planet without any propulsion at all. This is possible because the spacecraft is taking a "lunar free return trajectory."

<https://indianexpress.com/article/technology/science/nasa-artemis-2-astronauts-crew-8536175/>

