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Mon, 10 Oct 2022

Indigenously Built Airborne Early Warning and Control Systems (AEWC) Used in Balakot Airstrikes: DRDO Scientist



Governor Tamilisai Soundarajan with DRDO-DG (AS) Tessy Thomas and other women scientists at a conclave held at the CSIR-IICT by NASI & ASTC, in Hyderabad on October 10, 2022.

It was indigenously built Airborne Early Warning and Control Systems (AEWC), a flagship programme of the DRDO, which was used by the Indian Air Force (IAF) during the Balakot airstrikes across the border as it could provide effective radar surveillance on air and ground across long distances not possible by the ground based radar, informed DRDO Director General Micro-electronic devices, computational systems and cyber systems Suma Varughese on Monday. Addressing the ASTC- Dr. K.V.Raghavan memorial lecture at the 'Women Scientists Conclave: Self Reliance' organised by the National Academy of Sciences, India and Academy for Science, Technology and Communication (ASTC) at the CSIR-IICT auditorium, the top scientist said that it took a decade and a half to come up with an effective AEWC with a range of more than 300 km, operating from 30,000 ft altitude as the developed nations were not ready to part with the technology.

The Indian AEWB was built on the Brazilian Embraer transport plane platform like a few other countries but the process of integrating the systems with six km of cabling for looking like an eye in front to detect, identify and help in the battle operational part was a challenging process. She noted that four defence scientists and four IAF personnel had lost their lives in one of trial runs in 1999. Dr. Varughese, who had worked at the Centre for Airborne System (CABS), said defence scientists had to develop an indigenous electronic antenna, circuit systems and components for the AEWB. Her illustrious colleague DRDO Director General (Aeronautical Systems) Tesse Thomas, who gave the inaugural address in the place of CSIR-Director General Kalaiselvi, who could not make it to the function, gave an overview of the missile development programme.

From not having the technology, raw materials and expertise, the country has grown to make indigenous missile systems like Agni and others overcoming various issues across the last two decades of guidance systems, pouring into various complex mathematical equations relating to the Earth's rotation and revolution, algorithms, rocket motors, carbon composites, etc. "It was total team work which involved many women scientists," she said, to a thunderous applause by the gathering. Later, S.N. Bose National Centre for Basic Sciences's director Tanusri Saha-Dasgupta spoke on 'materials by computation, challenges and opportunities', University of Hyderabad's Geeta Vemuganti spoke on 'stem cells in eye research and Centre for DNA Fingerpringing and Diagnostics Sangitha on Tuberculosis and immunological therapy.

<https://www.thehindu.com/news/cities/Hyderabad/indigenously-built-airborne-early-warning-and-control-systems-aweb-used-in-balakot-airstrikes-drdo-scientist/article65992378.ece>

DRDO On Twitter





Tue, 11 Oct 2022

Indian Air Force Plans to Induct Women Officers to Fly LCH Prachand

After the successful induction of the Light Combat Helicopter (LCH) 'Prachand' into its fleet on October 3, the Indian Air Force (IAF) is planning to induct women officers to fly these choppers. "Women officers will be inducted into the fleet of Light Combat Helicopters", IAF officials told India Today. The lady officers already flying the Advanced Heavy Lifter (ALH) helicopters are being identified for induction into the fleet, they said. An indigenous-built Light Combat Helicopter (LCH) 'Prachand' was inducted into the Indian Air Force at Jodhpur airbase in the presence of Defence minister Rajnath Singh, CDS General Anil Chauhan and IAF chief Air Chief Marshal VR Chaudhari. The defence minister named the helicopter "Prachand" (fierce) and said the platform, capable of operating day and night, will add a significant edge to the IAF's combat capabilities as it can hit enemy targets with precision. Singh, who also flew the LCH, said it could operate in all possible conditions and was among the best globally in its class.

The LCH is a dedicated combat helicopter designed and developed indigenously in India, manufactured by Hindustan Aeronautics Limited (HAL). According to HAL, the light combat helicopter is the only attack helicopter in the world that can land and take off at an altitude of 5,000 metres (16400 ft) with a considerable load of weapons and fuel, meeting the specific requirements of the Indian Armed Forces. The induction of the chopper comes at a time India and China are locked in a military stand-off at certain friction points in eastern Ladakh.

The helicopter is equipped with the requisite agility, manoeuvrability, extended range, high-altitude performance and around-the-clock, all-weather combat capability. It would be a potent platform to meet the operational requirements of the Indian Air Force and the Indian Army. The helicopter can also be deployed in high-altitude bunker-busting operations, counter-insurgency operations in the jungles and urban environments, and for supporting ground forces.

<https://www.indiatoday.in/india/story/indian-air-force-plans-induction-women-officers-to-fly-light-combat-helicopter-prachand-2283685-2022-10-11>

Force Multiplier: India to Enable Multi-Intelligence with Raytheon's ISTAR Aircraft

India is actively pursuing five ISTAR (Intelligence, Surveillance, Target Acquisition and Reconnaissance) aircraft under the India-US Defence Technology and Trade Initiative (DTTI) framework. In his address on the 90th Air Force Day Parade in Chandigarh, Chief of Air Staff Air Chief Marshal VR Chaudhari indicated that IAF is not only actively pursuing the acquisition of UAVs, ISTAR, Counter UAS technology, the focus is also on strengthening its networks. The five ISTAR aircraft that India is planning to get from the US is expected to cost approx US\$ 3 bn.

The missing piece

The Indian Air Force has been severely lacking a multi-intelligence aircraft. Although India has been delivering Dorniers to Sri Lanka for maritime intelligence, there needs to be more modern intelligence aircraft. Intermittently, procuring unmanned aerial vehicles (UAVs) has been a stopgap. To this effect, various UAVs are now deployed by the Indian armed forces. India has been looking to develop its own ISTAR aircraft and relied on the Defence Research and Development Organisation (DRDO) to prepare the sensor package. "Apparently, the movement on the acquisition of ISTAR was hindered by an internal kerfuffle between the DRDO and the Indian Air Force (IAF). With government intervention, progress on the ISTAR was resumed," a senior officer who wished to remain anonymous told Financial Express Online.

Raytheon's Multi-Intelligence Star: ISTAR

Raytheon Intelligence and Space offers its multi-intelligence aircraft, ISTAR, which employs artificial intelligence, integrated onboard sensors and advanced processing. This aircraft provides critical information to air and ground crews.

More about ISTAR

The ISTAR aircraft can track mobile ground targets, map natural disaster areas, and monitor ships and activities near borders and littoral regions. It also can be used with a fixed or mobile station to perform command and control operations. The Active Electronically Scanned Array (AESA) radar on the ISTAR provides Ground Moving Target Indicator (GMTI), Synthetic Aperture Radar (SAR) and Inverse Synthetic Aperture Radar (ISAR). The SAR and ISAR measure distances with extreme precision and can be used to measure topography and 3D structures. The location accuracy is significantly higher and is also the go-to radar for space exploration. ISTAR also is equipped with a Long Range Oblique Photography (LOROP) camera, which captures comprehensive images. In general, oblique photography offers the most advantageous position to improve the interpretation of the photos.

According to the information available in the public domain, ISTAR from Raytheon is a cut above the rest, given its superior intelligence capabilities. It merges radar, imagery and signals

intelligence to give operators a stream of intelligence to enable excellent tracking of targets. In mountainous regions, radars often lose an edge.

What has been offered to India?

The ISTAR offered to India is likely based on the Canadian Bombardier's Global Express business jet aircraft. The Global Express has a maximum ceiling of 51,000 feet. It can fly up to 499 knots of speed and up to a distance of 7,000 miles. For India, the ISTAR aircraft can genuinely be a game-changer.

<https://www.financialexpress.com/defence/force-multiplier-india-to-enable-multi-intelligence-with-raytheon-istar-aircraft/2705866/>

THE ECONOMIC TIMES

Mon, 10 Oct 2022

India's New Weapons Systems Branch: Key Facts & Figures and What's Special about It

India's armed forces are set to get a major operational boost following the approval to set up a separate service — a Weapons Systems Branch (WSB) for the officers of the IAF. This is the first time since Independence that a new operational branch is being set up. The WSB will bring different weapons systems operators under one entity. It will streamline the operational employment of all specialist airborne and ground-based weapons systems. According to a statement by Air Chief Marshal V R Chaudhari, the new branch will essentially "man the specialised streams of surface- to-surface missiles, surface-to-air missiles, remotely piloted aircraft, and weapon system operators in twin and multi-crew aircraft."

New era in warfighting

The new development comes amid a steady emphasis on enhancing 'jointness' among the three services as no single arm of the military can win wars on its own now. Today's warfare is mostly multi-domain, which calls for a flexible and more streamlined command & control centre. The emergence of drones & swarm drones, hypersonic weapons, and space-based Intelligence, Surveillance and Reconnaissance (ISR) system has added a whole new dimension to warfighting. In this respect, the WSB is expected to help the forces establish dominance across multiple domains. Besides, the upcoming system is also likely to create the conditions to make that India has access to cutting-edge technology that meets its emerging needs. The new branch will make for a significant diversion from India's current military operations system. While the army has deployed drones for surveillance for quite some time, the IAF has been using airborne and precision strike missiles.

Saving on costs

Experts term this system as "fragmented and resource-inefficient". In the cases of both the army and the IAF, the task is assigned to human resources with training as pilots. However, operating the weapon systems doesn't require flying training. Flying training entails major expenses. So basically, the current system leads to significant wastage of resources as personnel trained for

flying are used for a task where flying training is not even needed. As per current calculations, the new system is likely to help save more than Rs 3,400 crore on account of reduced cost on flying training.

Streamlining operations

The WSB will bring the requirements of different branches of the forces under one head. This will make India's defence and strategic systems more efficient. As instances of duplication come down, it will help forces circulate information in a better way, leading to better defence outcomes. The new system is expected to plug a big gap in defence preparedness amid warfare's changing nature in the wake of the emergence of unmanned armed systems like drones and missiles.

<https://economictimes.indiatimes.com/news/defence/indias-new-weapons-systems-branch-key-facts-figures-and-whats-special-about-it/articleshow/94764450.cms?from=mdr>

ThePrint

Mon, 10 Oct 2022

MiCoB Delivers 3D Concrete Printed Runway Controller Hut for the Pune Air Force Station

MiCoB Pvt Ltd, an Industry 4.0 start-up company based out of Gandhinagar, Gujarat, announced today that it has delivered a 3D concrete printed runway controller hut to the Military Engineer Services for the Airbase in Pune in a record time of 30 days. The built-out structure is India's very first hybrid 'G+1' building to use 3D Concrete Printing with pre-fabricated steel structure. "MiCoB is currently laser-focused on its mission of 'Defend the Defenders' by helping build 3D Concrete Printed structures for the Indian Military which includes permanent defence structures, 'G+1' living spaces and other critical infrastructure in far-flung geographical areas and extreme climate zones in India," said Shashank Shekhar, the CEO and a co-founder of MiCoB. "MiCoB believes that robotic 3D Concrete Printing combined with conventional and other innovative construction technologies has the potential to bring speed, design flexibility and better quality compliance in the construction industry," Shashank added.

"The robotic 3D concrete printer, high-performance ink, a proprietary software solution and our design and engineering services form the core of what we have developed at MiCoB since our journey began at IIT Gandhinagar," said Rishabh Mathur, the CTO and a co-founder of MiCoB, "I am proud to say that we have solved the toughest construction problem of building critical infrastructure under extreme geo-climatic conditions and at high speed with great quality." "Even the sky is not the limit for us as we embark on a future filled with disruptive opportunities in residential, office, public works, outdoor furniture, decorative artefacts, licensing and franchising our 3D concrete printer and ink technology.

<https://theprint.in/ani-press-releases/micob-delivers-3d-concrete-printed-runway-controller-hut-for-the-pune-air-force-station/1161358/>

India Plans Malabar Exercise with Quad Partners as Russian War Promises a Winter Surge

Malabar, the Indian sea coast on its southwest is living up to its famed name. Once known to be of particular geo-strategic interest to major western powers and their expeditionary navies that fought many a pitched battle for control of the sea route and the nearby coast that promised a control of India and further the lands east, the upcoming biennial Exercise Malabar is going to be held at an interesting time. With a source in the Indian military establishment confirming slating of the impending event from November 8-18 off Japanese waters, it will have huge implications for India's delicate balancing of the strategic relationship with old friend Russia on one hand and a growing military association with the US.

“Two Indian warships—a Shivalik class and a Kamorta class—besides a Long Range Maritime Patrol Aircraft P8I will represent the Indian Navy in the exercise in Japan. Just before that the two warships will also participate in an International Fleet Review in Japan,” the source told THE WEEK. The other participants in Exercise Malabar will be from the United States Navy (USN), the Royal Australian Navy (RAN), and the Japan Maritime Self Defence Force (JMSDF)—members of the ‘Quad’ or the Quadrilateral Security Dialogue. ‘Quad’ is commonly seen to be a grouping with an anti-China bias with a commitment to ensure “a free and open Indo-Pacific”.

While Russia has till now stopped short of calling its foray into Ukraine as an all-out war—it still maintains the effort is a special operation—there are good chances that a Russian war declaration may happen given the way the protracted conflict is panning out. There are good reasons too. Russia has already made gas and oil a scarce commodity in Europe and elsewhere by constricting supplies even as surging levels of inflation are already taking a toll. It is mainly Russian gas that is used to heat homes across Europe during the harsh winters. With the winter cold scything across, Russia—known for being most familiar with winter wars and using the elements of nature to its military advantage—may go in for the kill. The very recent reverses inflicted by the doughty Ukrainians on the Russians including taking over the important city of Lyman may only serve to make the Russians more desperate to use the winter to their advantage.

For India, it may yet again present a scenario it could have done without. To be seen taking part in a major military exercise with the US, the main force behind the burgeoning Ukrainian resistance to the Russians, and yet to step back from a scathing criticism of the Russian action in Ukraine, may be a difficult situation to explain. Undoubtedly, Indian diplomatic skills will be tested to the hilt.

<https://www.theweek.in/news/india/2022/10/10/india-plans-malabar-exercise-with-quad-partners-as-russian-war-promises-a-winter-surge.html>

Indian Naval Ships Enter UAE for Long Range Training Deployment

As part of the long-range deployment training for the newly inducted officers of the Indian Navy, two ships of the Indian Navy INS Tir, and INS Sujata, and one ship of Indian Coast Guard Sarathi entered Port Rashid in Dubai, UAE. The ships were received by the Defence Attache at the Embassy of India in UAE and officials of the UAE Navy. The three ships belong to the First Training Squadron (1TS) and are deployed in the Persian Gulf as part of their training deployment. First Training Squadron (1TS) is based at Kochi and is part of the Southern Naval Command, the Indian Navy's Training Command. "The deployment of 1TS is aimed at exposing the trainees to the conduct of various evolutions at sea and port familiarization. The present deployment also provides an opportunity in exposing the trainees to the sociopolitical, military and maritime linkages of India with friendly countries in our maritime neighborhood," the Union Ministry of Defence said in a press release.

For visiting UAE naval officers, professional interaction and a brief walkaround of the ship were conducted. During the port call in UAE, cross-training visits and community interaction activities were also planned for young officers. The sea trainees were also exposed to various sea evolutions, maneuvers, and seaboat operations. Before UAE, the First Training Squadron made a port call at Kuwait on 5 October where Indian ships were accorded a warm welcome by senior officers of the Kuwaiti Naval forces, Border Guard, and the Embassy of India officials besides school children. The three-day port call includes professional engagements, cross-ship visits, community outreach, and social interactions.

After completing their ab-initio training at the Indian Naval Academy, the Executive Officers of the Indian Navy are assigned to the First Training Squadron (1TS) in Kochi. The Squadron comprises seven indigenously built ships, namely, Indian Naval Ships Tir, Sujata, Magar, Shardul, Coast Guard Ship Vikram and two Sail Training Ships INS Sudarshini and INS Tarangini. The Squadron is currently helmed by Captain Aftab Ahmed Khan, Senior Officer First Training Squadron who also dons the dual hat of Commanding Officer, INS Tir.

<https://www.livemint.com/news/india/indian-naval-ships-enter-uae-for-long-range-training-deployment-11665391152784.html>

West did not Supply Weapons to India for Decades: Jaishankar

India has a substantial inventory of Soviet and Russian-origin weapons because the Western countries opted a military dictatorship in the region as its preferred partner and did not supply weapons to New Delhi for decades, External Affairs Minister S. Jaishankar said on October 10, in an apparent reference to Pakistan. During a joint press meet with his Australian counterpart Penny Wong in Canberra, Mr. Jaishankar also said that India and Russia have a long-standing relationship that has certainly served New Delhi's interests well. "We have a substantial inventory of Soviet and Russian-origin weapons Mr. Jaishankar said, in an apparent reference to Pakistan, which was a close ally of the U.S.-led West during the Cold War.

Pakistan has been ruled by the Army Generals for more than half of its 73 plus years of existence. "We all in international politics deal with what we have, we make judgments, judgments which are reflective of both our future interests as well as our current situation. And my sense is, in terms of this current conflict, like every military conflict, there are learnings from it, and I am sure my very professional colleagues in the military would be studying it very carefully," Mr. Jaishankar said. He was asked by an Australian reporter whether India should reduce its reliance on Russian weapons systems and rethink its relationship with Russia, given what is going on in Ukraine.

Last month, Jaishankar, during a joint press conference with U.S. Secretary of State Antony Blinken, said that India exercises a choice which it believes is in its national interest when it is offered weapons. Russia has been a major supplier of military hardware to India. The two countries have been holding discussions on what kind of payment mechanisms can work between them in view of the Western sanctions on Moscow. Russian Ambassador to India Denis Alipov said last month that Russia has delivered its most advanced long-range surface-to-air missile defence system S-400 to India on time despite pressure from Washington and the U.S.-led West's sanctions. The S-400 is known as Russia's most advanced long-range surface-to-air missile defence system.

Russia had started delivery of the first regiment of the missile in December last year. The missile system has already been deployed in such a way that it can cover parts of the border with China in the northern sector as well as the frontier with Pakistan. In October 2018, India had signed a \$5 billion deal with Russia to buy five units of the S-400 air defence missile systems, notwithstanding warning from the then Trump administration that going ahead with the contract may trigger U.S. sanctions under CAATSA. Countering America's Adversaries Through Sanctions Act or CAATSA is a tough U.S. law which authorizes the administration to impose sanctions on countries that purchase major defence hardware from Russia in response to Russia's annexation of Crimea in 2014 and its alleged meddling in the 2016 U.S. presidential elections.

<https://www.thehindu.com/news/national/west-did-not-supply-weapons-to-india-for-decades-jaishankar/article65992003.ece>



Mon, 10 Oct 2022

‘West’s Preferred Partner was Military Dictator Next to US’: Jaishankar on Robust India-Russia Defence Ties

Union external affairs minister S Jaishankar said that India has a substantial inventory of Soviet and Russian weapons while speaking to mediapersons in Canberra on Monday. Jaishankar’s response came when he was asked about defence and strategic ties between India and Russia during a joint press conference with his Australian counterpart Penny Wong. “We have a long-standing relationship with Russia, and this relationship has served our interests well. We have a substantial inventory of Soviet and Russian-origin weapons,” Jaishankar said. It must be noted that the West, following the onset of the Russian military operation in Ukraine, has been subtly critical of India-Russia ties.

The S-400 deal where India will receive Russia’s most advanced long-range surface-to-air missiles has also attracted the ire of the US. The US, for long, through successive administrations, also thought of imposing the Countering America’s Adversaries Through Sanctions Act (CAATSA) on India but it did not find enough political momentum even within the US. However, Jaishankar said the relations between then-Soviet Russia, as well as post-Soviet Russia, and India grew stronger because Western nations were fond of the dictators who were in power in India’s neighborhood. Without naming Pakistan, he referred to the time period when the US courted Pakistani military generals General Ayub Khan and General Zia-ul-Haq and also to some extent Gen. Pervez Musharraf.

These three army generals in 1958, 1977 and 1999 toppled democratically-elected governments. “This inventory grew for various reasons including the West not supplying weapons to India for decades and, in fact, seeing the military dictatorship next to us as a preferred partner. In international politics, we make judgments which are reflective of our future interests and current situation,” Jaishankar said. The US-India ties also turned sour when the US and the West did not provide support for the Bangladesh Liberation struggle and also supported the Pakistan government who were accused of human rights violations across Bangladesh in 1971.

Jaishankar also said that India continues to pray for peace in Ukraine and believes diplomacy and dialogue can resolve the conflict. “We have been very clearly against the conflict in Ukraine. We believe that this conflict does not serve the interest of anybody- neither the participants nor the international community,” Jaishankar was quoted as saying by news agency ANI. Australian foreign minister Penny Wong was more direct in her condemnation of Russia. Wong, however, welcomed Prime Minister Narendra Modi’s discussions with Russian president Vladimir Putin where PM Modi raised his concerns with Putin. Wong said: “Australia condemns Russia’s illegal and immoral invasion of Ukraine, the annexations are illegal. We welcomed PM Modi writing his concerns to Mr Putin in September and saying that this is not a time for war.”

<https://www.news18.com/news/world/wests-preferred-partner-was-military-dictator-next-to-us-jaishankar-on-robust-india-russia-defence-ties-6132781.html>

Mon, 10 Oct 2022

India Expresses Concern over the Ukraine Conflict. Russian Prez Confirms Strikes

Amidst the escalation of the conflict in Ukraine, deaths of civilians and targeting of infrastructure, India has expressed its concern. Responding to media queries related to the escalation of the Ukraine-Russia conflict, the official spokesperson of Ministry of External Affairs (MEA) Arindam Bagchi, “We reiterate that escalation of hostilities is in no one’s interest. We urge immediate cessation of hostilities and the urgent return to the path of diplomacy and dialogue. India stands ready to support all such efforts aimed at de-escalation.” Since the beginning of the conflict, “India has been maintaining that the global order is anchored in the principles of international law, the UN Charter, and respect for sovereignty and territorial integrity of all states,” the spokesperson of MEA added. Reports in the public domain stated that the conflict has escalated and later in the day Russian President Vladimir Putin in an address confirmed that strikes have been carried out in Ukraine.

Early Monday morning cruise missiles have been fired by the Russian forces at cities across Ukraine. These missile attacks consistent with reports have knocked out heat and power and killed people. President Putin has declared this to be revenge for attacks including on a bridge to Crimea by the Ukrainian forces. Moscow had launched long-range missile attacks against Ukraine’s energy, military and communications infrastructure. In a televised address the Russian President said that Ukraine had carried out “terrorist acts” against Russia. And if they continued he pledged to react forcefully. “It is clear that the Ukrainian secret services ordered, organised and carried out the terrorist attack aimed at destroying Russia’s critical civilian infrastructure,” he has been quoted saying.

Where have explosions been reported?

They have been reported in Zaporizhzhya in the south and Kharkiv in the east, Zhytomyr, Lviv, Ternopil located in western Ukraine; Dnipro and Kremenchuk in central Ukraine.

Televised Address

In a televised address, the Russian leader said “The Kyiv regime, with its actions, has put itself on the same level as international terrorist organisations. With the most odious groups. To leave such acts without a response is simply impossible.”

What led to escalation?

On Saturday an explosion damaged the only bridge over the Kerch Strait which links Ukraine’s Crimea peninsula, which was annexed by Moscow in 2014, to Russia proper. Though Ukraine did not claim responsibility, it did celebrate the burning down of the bridge. According to reports, Ukrainian President Volodymyr Zelenskyy termed the strikes as deliberate which were timed to kill people and to knock out the country’s power grid. And his country’s prime minister has said that 11 major infrastructure targets were hit in eight regions and this left the country without power, heat or water.

Reportedly, Ukraine's defence ministry claims that 81 cruise missiles were fired by Russia and Ukraine's air defences had shot down 43 of them. While the European Union condemned Monday's "barbaric and cowardly attacks" on Ukraine, Putin's closest ally, President Alexander Lukashenko of Belarus, has according to reports ordered troops to deploy jointly with Russian forces near Ukraine.

Expert view from US based Think Tank

"As a means of trying to consolidate Russia's hold over the eastern regions of Ukraine his forces occupy, President Vladimir Putin is playing his ace card by threatening the use of nuclear attacks as a reprisal against attacks on Russia's new "sovereign territories"," US based Daniel Darling, Senior Military Markets Analyst, Europe & Asia/Pacific Rim, Forecast International Inc, tells Financial Express Online.

According to Daniel Darling, "It's a sign of weakness, not strength, but he's also betting government leaders aren't willing to call his bluff. And he is also betting it dissuades NATO from fast-tracking Ukrainian membership into the Alliance, which is extremely unlikely to happen anyway." In his opinion it is a dangerous card to play, but at this point in his flagging invasion of Ukraine it's what he has left to threaten with.

<https://www.financialexpress.com/defence/india-expresses-concern-over-the-ukraine-conflict-russian-prez-confirms-strikes/2706166/lite/>



Mon, 10 Oct 2022

All Targets Hit in Massive Missile Strikes on Ukraine: Russia's Defence Ministry

Russia's defence ministry said it hit "all designated targets" in a massive missile attack on Ukrainian military, communications and energy infrastructure on Monday. Russia said the goals of the missile strikes had been achieved, in one of the largest coordinated Russian attacks against Ukraine since the first weeks of the war. Ukraine said the rush-hour attacks in eight regions appeared to have been deliberately timed to kill people, accusing Russia of terrorism. "Today, Russia's armed forces have inflicted a massive strike with high-precision long-range weapons against Ukrainian military, communications and energy targets," the Russian defence ministry said in its daily briefing.

"The goal of the strike has been achieved. All designated targets were hit," it added. Earlier, President Vladimir Putin said the attacks were retaliation for what he called Ukraine's "terrorist attack" against a vital bridge linking Russia to the annexed Crimean peninsula. He promised a "harsh" response to any further such attacks. Ukrainian officials have exulted in the bombing of the bridge but have not claimed responsibility for it. Ukraine says it is Russia that is using terror tactics in the war.

Russia's bombardment of Ukraine was celebrated by pro-war figures in Russia. The Russian-installed governor of Crimea said Russia would have already won its "special military operation"

had such strikes been carried out every day. Ramzan Kadyrov, the head of the Chechnya region who has been outspoken in his criticism of Russia's military leadership and repeatedly called for a more aggressive campaign, said he was "100% satisfied" with the strikes. Ukraine said it was seeking a "resolute response" from the United Nations and the West in response to the attacks. President Volodymyr Zelenskiy said the strikes, which hit the centre of Kyiv and several other Ukrainian cities, showed Russia was trying to "wipe us off the face of the earth."

<https://www.hindustantimes.com/world-news/all-targets-hit-in-massive-missile-strikes-on-ukraine-russia-s-defence-ministry-101665400106190.html>



Mon, 10 Oct 2022

Air Defence System to Reach Ukraine "In Days": Germany

Germany said Monday it was rushing long-promised air defence systems, capable of protecting an entire city, to Ukraine after Russia unleashed a barrage of missile strikes on the country. Calling the latest attacks "despicable", German Foreign Minister Annalena Baerbock wrote on Twitter that "we are doing everything to strengthen Ukraine's air defences". Chancellor Olaf Scholz in June promised the highly modern Iris-T systems that he said were capable of shielding a large city from air raids.

Germany had earlier expected to deliver the first of several missile shield systems by year's end, but Defence Minister Christine Lambrecht said the first would now be "ready for the effective protection of people in the coming days". "The latest rocket strikes on Kyiv and many other cities clearly underline the importance of the rapid delivery of air defence systems to Ukraine," she added. The Iris-T system has a shield range spanning a height of 20 kilometres (12 miles) and a breadth of 40 kilometres. The German army itself has Iris T-missiles in its inventory but not the complete surface-to-air system. It fires the missiles from Tornado or Eurofighter jets.

<https://www.ndtv.com/world-news/russia-ukraine-war-germany-aid-to-ukraine-air-defence-system-to-reach-ukraine-in-days-germany-3419249&cd=1&hl=en&ct=clnk&gl=in>



Mon, 10 Oct 2022

North Korea Confirms Nuclear Missiles Tests to 'Wipe Out' Enemies

North Korea's recent barrage of missile launches were tests of its tactical nuclear weapons to "hit and wipe out" potential South Korean and U.S. targets, state media reported Monday, as its leader Kim Jong Un signaled he would conduct more provocative tests. The North's statement, released on the 77th birthday of its ruling Workers' Party, is seen as an attempt to buttress a public unity behind Kim as he faces pandemic-related economic hardships, a security threat posed by the boosted U.S.-South Korean military alliance and other difficulties. "Through seven

times of launching drills of the tactical nuclear operation units, the actual war capabilities ... of the nuclear combat forces ready to hit and wipe out the set objects at any location and any time were displayed to the full,” the North’s official Korean Central News Agency said. KCNA said the missile tests were in response to recent naval drills between U.S. and South Korean forces, which involved the nuclear-powered aircraft carrier USS Ronald Reagan for the first time in five years. Viewing the drills as a military threat, North Korea decided to stage “the simulation of an actual war” to check and improve its war deterrence and send a warning to its enemies, KCNA said.

North Korea considers U.S.-South Korean military drills as an invasion rehearsal, though the allies have steadfastly said they are defensive in nature. Since the May inauguration of a conservative government in Seoul, the U.S. and South Korean militaries have been expanding their exercises, which had been previously scaled back due to the pandemic and the now-dormant nuclear diplomacy between Pyongyang and Washington. The launches — all supervised by Kim — included a nuclear-capable ballistic missile launched under a reservoir in the northeast; other ballistic missiles designed to strike South Korean airfields, ports and command facilities; and a new-type ground-to-ground ballistic missile that flew over Japan, KCNA reported. North Korea has previously test-launched missiles from a submarine off its east coast. But the most recent was its first public test of a weapon from under an inland reservoir.

Kim Dong-yub, a professor at Seoul’s University of North Korean Studies, said North Korea likely aims to diversify launch sites to make it difficult for its enemies to detect its missile liftoffs in advance and conduct preemptive strikes. KCNA said when the weapon launched from the reservoir was flying above the sea target, North Korean authorities confirmed the reliability of the explosion of the missile’s warhead, apparently a dummy one, at the set altitude. Kim, the professor, said the missile’s estimated 600-kilometer (370-mile) flight indicated the launch could be a test of exploding a nuclear weapon above South Korea’s southeastern port city of Busan, where the Reagan previously docked. He said the missile tested appeared to be a new version of North Korea’s highly maneuverable KN-23 missile, which was modeled on Russia’s Iskander missile.

North Korea described the missile that flew over Japan as a new-type intermediate-range weapon that traveled 4,500 kilometers (2,800 miles). Some foreign experts earlier said North Korea likely tested its existing nuclear-capable Hwasong-12 missile, which can reach the U.S. Pacific territory of Guam. But Kim, the professor, said the missile appeared to be an improved version of the Hwasong-12 with a faraway target like Alaska or Hawaii. Worries about North Korea’s nuclear program deepened in recent months as the country adopted a new law authorizing the preemptive use of its bombs in certain cases and took reported steps to deploy tactical nuclear weapons along its frontline border with South Korea. This year, North Korea has also carried out a record number of weapons tests with more than 40 ballistic and cruise missiles. Some experts say Kim Jong Un would eventually aim to use his advanced nuclear arsenal to win a U.S. recognition of North Korea as a legitimate nuclear state, which Kim sees as essential in getting crippling U.N. sanctions on his country lifted.

Kim Jong Un said the recent launches were “an obvious warning” to South Korea and the United States, informing them of North Korea’s nuclear response posture and attack capabilities. Kim also repeated that he has no intentions of resuming the disarmament diplomacy with the United States now and would rather focus on expanding his weapons arsenal, according to KCNA. “The U.S. and the South Korean regime’s steady, intentional and irresponsible acts of escalating the

tension will only invite our greater reaction, and we are always and strictly watching the situation crisis,” KCNA said.

Kim also expressed conviction that the nuclear combat forces of his military would maintain “their strongest nuclear response posture and further strengthen it in every way” to perform their duties of defending the North’s dignity and sovereign rights. South Korean officials recently said North Korea maintains readiness to perform its seventh nuclear test — its first such test in five years — while preparing to test a new liquid-fueled intercontinental ballistic missile as well as a submarine-launched ballistic missile. “North Korea has multiple motivations for publishing a high-profile missile story now,” said Leif-Eric Easley, a professor at Ewha University in Seoul. “Kim Jong Un’s public appearance after a month-long absence provides a patriotic headline to mark the founding anniversary of the ruling Workers’ Party.”

“Pyongyang has been concerned about military exercises by the U.S., South Korea and Japan, so to strengthen its self-proclaimed deterrent, it is making explicit the nuclear threat behind its recent missile launches. The KCNA report may also be a harbinger of a forthcoming nuclear test for the kind of tactical warhead that would arm the units Kim visited in the field,” Easley said.

<https://www.india.com/news/world/north-korea-confirms-nuclear-missiles-tests-to-wipe-out-enemies-5678354/>



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North Korea says it is Building Underwater Nuclear Weapons Silos

North Korea broke its silence on a recent flurry of missile tests Monday as its state media reported that the country’s leader, Kim Jong Un, had overseen the test launches of several nuclear-capable short-range ballistic missiles, including one that was fired from an underwater silo. The report was the first time that North Korea claimed it was building underwater nuclear weapons silos, suggesting that the country was developing technology that would make its missiles more difficult to detect and intercept. North Korean news media also published photos that purported to show a ballistic missile rising from under the waters of a reservoir. One of the recent tests, it said, was a rehearsal for firing nuclear weapons at airports in South Korea.

The North has launched 12 ballistic missiles in seven weapons tests in the past two weeks. All of them have been short-range missiles, except the intermediate-range ballistic missile launched Oct. 4 that flew over Japan, triggering alarms across the country’s north. On Monday, state-run media reported Kim’s presence at the testing sites for the first time in five months, releasing a ream of photographs. The country has conducted a record 25 missile tests this year. Monday marked the 77th anniversary of the North’s ruling Workers’ Party, and its state media appeared to highlight Kim’s leadership by showcasing his country’s growing nuclear and missile capabilities — Kim’s biggest achievement since taking power more than a decade ago. Kim was quoted as saying that the recent tests were designed to demonstrate “our nuclear response posture

and nuclear attack capabilities.” He said his country felt no need to engage in “dialogue with the enemies.”

Under Kim, North Korea has demanded recognition as a nuclear weapons state, vowing to never bargain away its nuclear deterrent. Since Kim’s diplomacy with former President Donald Trump collapsed without an agreement, North Korea has doubled down on boosting its weapons programs, testing several new missiles that were harder to detect and intercept because they could fly at hypersonic speeds or change course during flight or were launched from railway cars rolled out of tunnels. On Monday, North Korea said that in the missile test conducted Sept. 25, its soldiers simulated the loading of “tactical nuclear warheads at a silo under a reservoir,” testing their ability to launch ballistic missiles from “underwater silos.”

Three days after that test, North Korea fired two short-range missiles to practice launching tactical nuclear warheads that could “neutralize” South Korean airports, its state media said Monday. North Korea’s nuclear and missile programs are shrouded in secrecy, making it hard to assess their true capabilities. But analysts say Kim was using stalled talks with Washington to test and improve his weapons and raise the stakes in future negotiations. The missile North Korea launched over Japan on Oct. 4 was a new type of intermediate-range ballistic missile, the country said. It was the first North Korean missile to fly over Japan since North Korea test-fired two Hwasong-12 intermediate-range ballistic missiles in 2017.

It traveled about 2,800 miles, the longest distance ever traveled by a North Korean weapon, it said, matching estimates from South Korean and Japanese officials. When North Korea test-fired its intercontinental ballistic missiles in 2017 and again in March, it launched them at a deliberately steep angle so that they soared high into space before falling into waters between the Korean Peninsula and Japan.

After the test in 2017, North Korea claimed the ability to deliver nuclear warheads to the continental United States. The short-range and intermediate-range ballistic missiles it has launched in recent weeks were developed to target South Korea and United States military bases in the region, according to military experts. North Korea on Monday released photos of artillery and rocket-firing exercises conducted last week, as well as an air-attack drill that it said involved more than 150 fighter planes. It was the first time North Korea deployed so many planes at the same time during an exercise, it said. In Seoul, the office of President Yoon Suk Yeol said South Korea was boosting its alliance with the United States to deter North Korea. “We want North Korea to realize that possessing nuclear weapons not only endangers the peace and freedom of the region, but also does not help its own economy and security,” Kim Eun-hye, a spokesperson for Yoon, said Sunday.

<https://www.moneycontrol.com/news/world/north-korea-says-it-is-building-underwater-nuclear-weapons-silos-9306141.html>

Mon, 10 Oct 2022

China Launches First Solar Observatory to Solve Mystery of Sun's Eruptions

China launched the Advanced Space-based Solar Observatory (ASO-S), nicknamed Kuafu-1 in Chinese at 7.43 AM Beijing time (5.13 AM IST) on October 9, according to Chinese state-run media outlet *Xinhua*. Since then, ASO-S, which represents the country's ambitions to unravel the mysteries of the Sun, has entered its planned orbit. According to *Nature*, the trio of instruments on board will provide insights into how the Sun's magnetic field causes coronal mass ejections (CMEs) and other eruptions. Scientists in China have reportedly been waiting a long time for such an observatory. Such a mission was first pitched in the 1970s, Weiqun Gan, an astrophysicist at the Purple Mountain Observatory of the Chinese Academy of Sciences in Nanjing, to *Nature*.

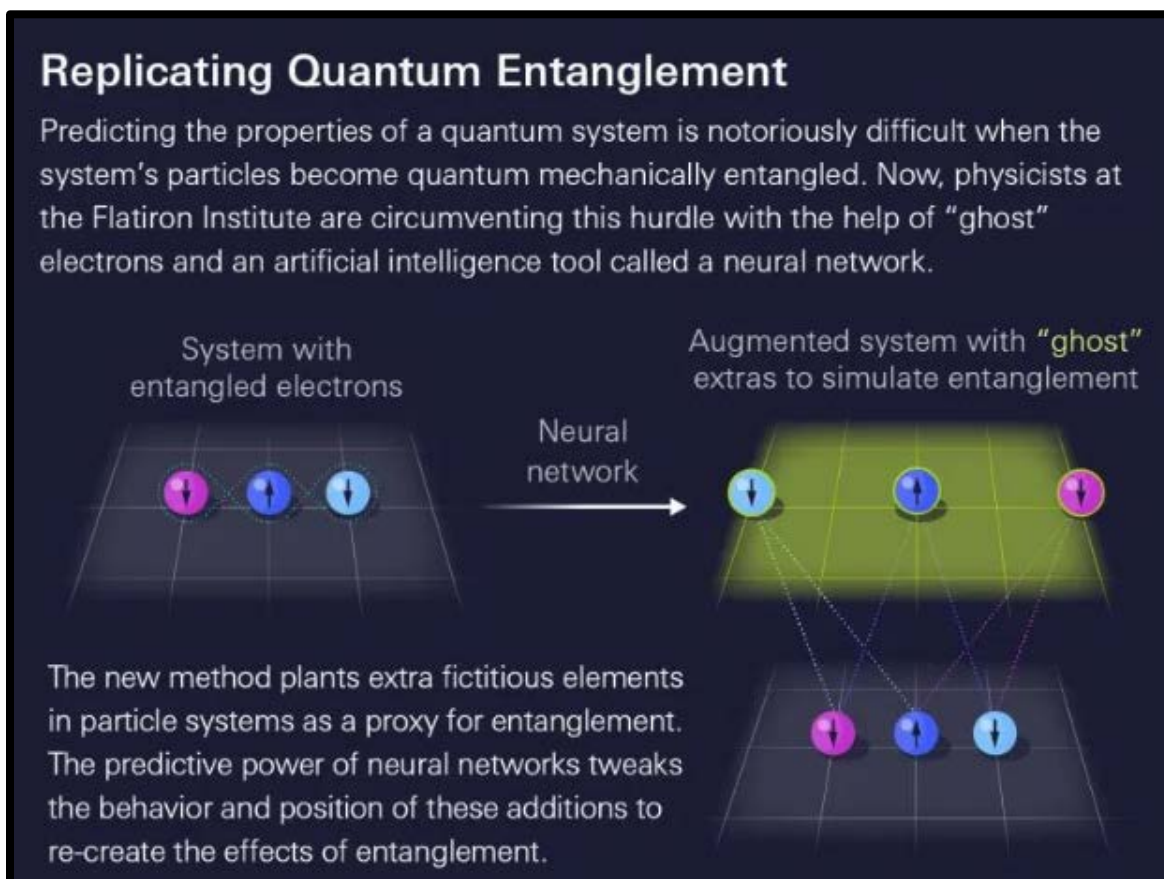
The instruments on board the observatory include a magnetograph to study the Sun's magnetic field, an X-ray imager for studying the high-energy radiations released by electrons accelerated in solar flares and a coronagraph which will look at the Sun in the ultraviolet visible range, in order to observe the plasma produced by solar flares and CMEs. Scientists understand that the Sun's magnetic field is what causes the eruptions but understanding the exact nature of the relationship between the both has proven difficult so far. ASO-S has instruments that look across different wavelengths at once, which should make it easier to understand the connections.

According to the science objectives of the mission written by Chinese Academy of Sciences officials, ASO-S will conduct simultaneous observations of both solar flares and CMEs to "understand their connections and formation mechanisms." *Nature* reports that ASO-S has the unique ability to study the middle corona, an important region of the sun where solar storms brew. According to the publication, this has never been seen before in its entirety in the ultraviolet spectrum.

<https://indianexpress.com/article/technology/science/china-aso-s-kuafu-1-launch-8200613/lite/>

Scientists Augment Reality to Crack the Code of Quantum Systems

Physicists are (temporarily) augmenting reality in order to crack the code of quantum systems. Calculating the collective behavior of a molecule's electrons is necessary to predict a material's properties. Such predictions could one day help scientists create novel drugs or create materials with desirable qualities like superconductivity. The issue is that electrons may become 'quantum mechanically' entangled with one another, which means they can no longer be treated individually. For any system with more than a few particles, the entangled network of connections becomes outrageously difficult for even the most powerful computers to unravel directly.



An infographic describing the process

Now, quantum physicists from the École Polytechnique Fédérale de Lausanne (EPFL) in Switzerland and the Flatiron Institute's Center for Computational Quantum Physics (CCQ) in New York City have found a workaround. By adding extra "ghost" electrons in their

computations that interact with the system's actual electrons, they were able to simulate entanglement. In the new approach, the behavior of the added electrons is controlled by an artificial intelligence technique called a neural network. The network makes tweaks until it finds an accurate solution that can be projected back into the real world, thereby re-creating the effects of entanglement without the accompanying computational hurdles. The scientists recently published their work in the journal *Proceedings of the National Academy of Sciences*.

"You can treat the electrons as if they don't talk to each other, as if they're noninteracting," says study lead author Javier Robledo Moreno, a graduate student at the CCQ and New York University. "The extra particles we're adding are mediating the interactions between the actual ones that live in the actual physical system we're trying to describe." In the new paper, the physicists demonstrate that their approach matches or outclasses competing methods in simple quantum systems. "We applied this to simple things as a test bed, but now we are taking this to the next step and trying this on molecules and other, more realistic problems," says study co-author and CCQ director Antoine Georges.

"This is a big deal because if you have a good way of getting the wave functions of complex molecules, you can do all sorts of things, like designing drugs and materials with specific properties." The long-term goal, Georges says, is to enable researchers to computationally predict the properties of a material or molecule without having to synthesize and test it in a lab. They might, for instance, be able to test a slew of different molecules for a desired pharmaceutical property with just a few clicks of a mouse. "Simulating big molecules is a big deal," Georges says. Robledo Moreno and Georges co-authored the paper with EPFL assistant professor of physics Giuseppe Carleo and CCQ research fellow James Stokes.

The new work is an evolution of a 2017 paper in *Science* by Carleo and Matthias Troyer, who is currently a technical fellow at Microsoft. That paper also combined neural networks with fictitious particles, but the added particles weren't full-blown electrons. Instead, they just had one property known as spin. "When I was [at the CCQ] in New York, I was obsessed with the idea of finding a version of neural network that would describe the way electrons behave, and I really wanted to find a generalization of the approach we introduced back in 2017," Carleo says. "With this new work, we have eventually found an elegant way of having hidden particles that are not spins but electrons."

<https://scitechdaily.com/scientists-augment-reality-to-crack-the-code-of-quantum-systems/>



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Indian Space Economy Set to Grow \$13bn by 2025

Indian space economy is set to reach \$13 billion by 2025, according to a joint report prepared by EY and the Indian Space Association (ISpA), an apex industry association of space and satellite companies in the country. The report also said the space launch segment would grow fastest at a CAGR of 13% spurred by growing private participation, latest technology adoption and low cost of launch services. satellite services and application segment would form the largest share of the space economy accounting for 36% of the space economy by 2025, as per the study. There are

over 100 space tech start-ups in the country and investments in space tech start-ups increased 196% y-o-y in 2021, the survey said. On the country's satellite manufacturing opportunity, it said in 2020 it was \$2.1 billion and this would reach \$3.2 billion by 2025.

Also, by 2025, satellite manufacturing would be the second fastest-growing segment in the Indian space economy. Space parks that are coming up across the country would give a fillip to companies operating across the space value chain, especially manufacturing, found the study. "With the rapidly growing space ecosystem, India is all prepared to grow to \$13 billion by 2025. We believe as India looks forward to the New Space Policy, the private industry's role is set to create a revolution in the current value chain of the Indian space economy," said Jayant D Patil, Chairman, ISpA.

<https://www.thehindu.com/business/indian-space-economy-set-to-grow-13-bn-by-2025/article65993436.ece>

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