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DRDO News

DRDO Technology News

TIMESNOW

Mon, 26 Dec 2022

What is HELINA — The Latest Weapon in the Indian Armed Forces Armoury

By Srinjoy Chowdhury

Indian Armed Forces are getting a new weapon — HELINA, the tank-busting missile.

Developed by the Defence Research and Development Organisation (DRDO), the HELINA is designed to be fired from helicopters and aircraft to destroy enemy tanks. This anti-tank guided missile (ATGM) has recently undergone trials and four of the five trials have been successful. Now, it has to be "integrated" into helicopters and Hindustan Aeronautics (HAL) and Bharat Dynamics (BDL) are at work on it. The "integration" should be complete by 2025 is the assessment.

The name HELINA explains the origin of the missile. It is an amalgamation of two words. "Heli" is short for 'helicopter'. "Na" comes from 'Nag' — the anti-tank guided missile the DRDO worked on over the years. Work on the HELINA began about a decade ago, and with the trials in September 2022 being successful, the decision to arm a helicopter with it was taken. The missile is largely indigenous with only the "seeker" being imported

With work already in progress for arming helicopters with the HELINA, there is also an effort to reduce the "human-machine interface" time. Simply put, the missile has to be fired as quickly as possible so that the enemy does not have the time to react. Currently, the 'acquisition' is taking 50-60 seconds, but it is being brought down to 30 seconds. This will allow the helicopter a better opportunity to destroy enemy tanks on the ground.

The HELINA should be ready in two-three years, but the question is of a stop-gap arrangement till then. One possibility is purchasing a foreign anti-tank missile that can be fired from a helicopter. There are missiles like Spike and Hellfire that are readily available, though very few cases involving the purchase of foreign weapons are coming up in the Defence Acquisition Council, which is headed by defence minister Rajnath Singh and includes the Chief of Defence Staff Anil Chauhan and the three chiefs. The other option is a collaboration with a foreign manufacturer and ensuring that it is produced in India.

<https://www.timesnownews.com/india/what-is-helina-the-latest-weapon-in-the-indian-armed-forces-armoury-article-96512528>

Pralay — India's First Tactical Quasi-Ballistic Missile, a Step towards Own Rocket Force

By Snehesh Alex Philip

The decision by the Defence Ministry to procure indigenous short-range ballistic surface-to-surface (SRBM) missile Pralay, a conventional weapon that has become ready for induction in just seven years, gives Indian military the heft to its war-fighting capabilities. The missile will be India's first tactical quasi-ballistic missile and will give the armed forces the capability to hit enemy positions and key installations in actual battlefield areas.

Pralay, along with the BrahMos supersonic cruise missile, will form the crux of India's planned Rocket Force — a concept that was envisaged by former Chief of Defence Staff (CDS), the late General Bipin Rawat. Sources in the defence establishment made it clear that only conventional missiles would come under the planned Rocket Force as and when it's ready, while nuclear weapons would continue to be under the ambit of the Strategic Forces Command. The Pralay missile project was sanctioned in 2015 and is a derivative of the Prahaar missile programme, which was first tested in 2011. Sources said Pralay was formed through elements from multiple missile programmes that include the K-series of submarine-launched ballistic missiles and the ballistic defence shield programme.

The canisterised Pralay missile, with a range of 150-500 kilometres, has been developed according to the specifications and requirement of the Army, which was looking to arm itself with a tactical conventional missile that could be used on the battlefield. Incidentally, both China and Pakistan have tactical ballistic missiles.

What makes Pralay deadly

The Indian missile can be compared to China's Dong Feng 12 and the Russian Iskander missile that has been used in the ongoing war with Ukraine. The US Army is in the process of increasing the range of a similar short-range ballistic missile called the Precision Strike Missile (PrSM). What makes Pralay deadly is that it is a quasi-ballistic weapon, which means that while it has a low trajectory and is largely ballistic, it can manoeuvre in flight. It has been designed to evade interceptor missiles, sources in the defence establishment said. Ballistic missiles are initially powered by a rocket or series of rockets in stages, but then follow an unpowered trajectory that arches upwards before descending to reach its intended target at high speed. Unlike intercontinental ballistic missiles that exit the Earth's atmosphere, short-range ballistic missiles stay within it.

Sources added that Pralay would eventually be part of the Rocket Force, which will also include the BrahMos as well as the Smerch and indigenous Pinaka multi-barrel missile launchers, besides a few other systems that are being built. Pralay is powered with a solid propellant rocket motor and multiple new technologies and, according to sources, accuracy is a highlight of this missile. It is capable of carrying a conventional warhead of about 350 kg to 700 kg, which gives it a deadly punitive capability. It can carry a high explosive preformed fragmentation warhead, penetration-cum-blast (PCB) and runaway denial penetration submunition (RDPS). Asked what

was the need for a ballistic missile when there is already a cruise missile whose range can be shortened for use in a battlefield, sources explained that both have their own distinct advantages. While BrahMos has high agility, stealth and even loitering capability, Pralay has the advantage of speed and countering it is a difficult task, even for modern air defence systems.

<https://theprint.in/defence/pralay-indias-first-tactical-quasi-ballistic-missile-a-step-towards-own-rocket-force/1283224/>

Defence News

Defence Strategic : National/International



Press Information Bureau
Government of India

Ministry of Defence

Mon, 26 Dec 2022

Centre for Land Warfare Studies (CLAWS) Organises Two-Day Seminar on the Theme of “Civil Military Integration: The Way Forward”

Centre for Land Warfare Studies (CLAWS), an independent New Delhi based think tank, is conducting a two-day Seminar on the theme of “Civil Military Integration: The Way Forward”, at Manekshaw Centre, Delhi Cantt. The Seminar opened today with discussions on the role of Military and Bureaucracy in adopting Whole of Nation approach to tackle security challenges. General Anil Chauhan, Chief of the Defence Staff and General Manoj Pande, Chief of the Army Staff addressed the gathering at the commencement of the proceedings. During his address, the CDS highlighted the pivotal role played by the Armed Forces as part of ‘Whole of Government’ approach towards National security. He emphasised that all defence initiatives should be aligned to draw mutual benefits from Government schemes like Aatmanirbharta, Vibrant Border Villages, Gati Shakti, National Logistics Policy to achieve higher defence preparedness.

Delivering the Key Note Address, the Army Chief spoke on the importance of synergy to correctly assess threats, articulate vital strategic guidelines and documents, identify the desired military capabilities, formulate enabling policies, achieve the required preparedness metric and effect appropriate responses, congruent to overall National Security objectives.

The event is being attended by distinguished participants from Armed Forces, Civil Services, as well as representatives from the defence industry and the academic community, including several think tanks and educational institutions. During the course of deliberations today, many eminent speakers discussed nuances of Bureaucracy-Military integration, a subject of great relevance to India’s comprehensive growth as a Nation. Diverse and useful views were shared by Shri Ajay

Kumar, former Defence Secretary, Lt Gen Anil Puri, Additional Secretary, DMA, Dr Manoj Joshi, ORF, Dr Anit Mukherjee of Nanyang Technological University, Singapore, Dr Arvind Gupta, Director VIF, Lt Gen Raj Shukla (Retired), Member UPSC and Lt Gen Vinod Khandare, Principal Adviser, MoD. The second day of this seminar is being dedicated on the discussions pertaining to Military Industry integration, which requires synchronisation of the interests of the indigenous defence industry with the operational requirements of the Armed Forces, through collaborative engagement. Eminent speakers for tomorrow's discussions include senior officers of the three Services, Air Marshal Anil Chopra (Retired), DG Centre for Airpower Studies, Lieutenant General PR Shankar, former DG Artillery, Shri Rajinder Singh Bhatia, President, Bharat Forge Defence and Aerospace, Dr Bhartendu Kumar Singh, Indian Defence Account Services and Rear Admiral Pritam Lal (Retired), Principal Advisor Confederation of Indian Industries and Society of Indian Defence Manufacturers.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1886726>



Tue, 27 Dec 2022

Defence Services Saw Indigenous Push in 2022

By Mayank Singh

The armed forces in the year 2022 witnessed commissioning and inductions of warships, aircraft and submarines with a conspicuous stamp of indigenous content. The commissioning of India's first indigenous aircraft carrier INS Vikrant by Prime Minister Narendra Modi at Cochin Shipyard Limited in September showcased the country's growing prowess of indigenous manufacturing. With 76% indigenous content, the 262.5 m long and 61.6 m wide ship is equipped with state-of-the-art equipment/systems, designed for a crew of around 1,600 officers and sailors.

The carrier is capable of operating an air wing consisting of 30 aircraft comprising MiG-29K fighter jets, Kamov-31, MH-60R multi-role helicopters, in addition to indigenously manufactured Advanced Light Helicopters and Light Combat Aircraft Navy. Another indigenous combat platform Light Combat Helicopter (LCH) 'Prachand', designed and developed by Hindustan Aeronautics Limited (HAL), was inducted into the Indian Air Force in Jodhpur in October 2022. The LCH is the first indigenous Multi-Role Combat Helicopter which has potent ground attack and aerial combat capability. It possesses modern stealth characteristics, robust armour protection and formidable night attack capability. Onboard advanced navigation system, guns tailored for close combat and potent air to air missiles make the LCH especially suited for the modern battlefield. It is capable of operating from high altitude terrain and carrying out precision strikes at high altitude targets.

Army, Navy, Air Force and even the Indian Coast Guard inducted major aerial platforms designed and built in India. Indian Naval Air Squadron (INAS) 325, operating the indigenously built Advanced Light Helicopter (ALH) Mk-III, was commissioned into the Indian Navy at INS Utkrosh, Port Blair, Andaman & Nicobar Command in May 2022. The unit was the second ALH MK III Squadron commissioned into the Indian Navy. The state-of-the-art multi role helicopter has been developed and manufactured by HAL.

The ALH Mk-III helicopters feature state-of-the-art equipment including advanced RADAR as well as Electro optical sensors, Shakti engines, full glass cockpit, high-intensity search light, advanced communication systems, automatic identification system as well as search-and-rescue homer. This feature enables the helicopter to undertake maritime reconnaissance as well as carry out search and rescue at extended ranges while operating from ships, both by day and night.

The Indian Navy saw inductions of the Missile Destroyers and Frigates having been designed and developed by the Indian Navy's inhouse Department of Naval Design and manufactured in Indian shipyards. Two frontline warships of the Indian Navy — 'Surat' and 'Udaygiri' — at Mazagon Docks Limited, Mumbai were commissioned in May. 'Surat' is the fourth Stealth-Guided Missile Destroyer of P15B class, while 'Udaygiri' is the second Stealth Frigate of P17A class.

Project 15B class of ships are the next-generation stealth guided-missile destroyers of the Indian Navy which are follow-on class of the weapon intensive P15A (Kolkata Class) Destroyers. P17A Frigates are warships that are follow-on class of the P17 (Shivalik Class) Frigates with improved stealth features, advanced weapons & sensors and platform management systems. Y-12705 (Mormugao), the second ship of Project 15B, was delivered to the Indian Navy in November, while fifth Stealth Frigate 'Taragiri' of P17A was launched in September.

76% indigenous content in INS Vikrant

The commissioning of India's first indigenous aircraft carrier INS Vikrant by the PM Narendra Modi at Cochin Shipyard Limited in September showcased the country's growing prowess of indigenous manufacturing. The ship has 76% indigenous content.

<https://www.newindianexpress.com/nation/2022/dec/27/defence-services-saw-indigenous-push-in-2022-2532082.html>



Tue, 27 Dec 2022

A Warship Programme that Must Go Full Steam Ahead

By A.K. Chawla

Early this month, the Indian Navy chief, Admiral Hari Kumar, at the annual press conference on the eve of Navy Day (December 4) had said that the Indian Navy had put on hold its plans to build a second indigenous aircraft carrier (IAC-2) that is larger than IAC-1 (INS Vikrant). Instead, he said, it is considering the option of a repeat order of the IAC-1. The Navy chief added that this decision had been taken as INS Vikrant had performed well during its trials and would also help capitalise on the expertise now available in the country.

Classification of carriers

In terms of size, aircraft carriers can be classified as light, medium and large/super-carriers. Light carriers can carry up to 25 aircraft, the medium-sized ones around 30 to 50 aircraft, while the large/super-carriers can carry over 90 aircraft. In terms of role, they can be categorised as fleet, escort, air defence, amphibious assault and anti-submarine warfare (helicopter) carriers. In terms of the methodology used to launch and recover aircraft, they can be categorised as Catapult

Assisted Take-Off But Arrested Recovery (CATOBAR), Short Take-off But Arrested Recovery (STOBAR), and vertical/short take-off and landing (V/STOL) carriers.

India's first aircraft carrier, INS Vikrant (British-built), predecessor to INS Vikrant (IAC-1), was a 19,000-tonne CATOBAR-type light carrier designed for fleet air defence. It could carry between 21 to 23 aircraft (including helicopters). Its replacement, INS Viraat (British-built), at 28,000 tonnes, was a V/STOL-type light fleet air defence carrier, with an air wing of 26 to 30 aircraft and helicopters. Notably, its Sea Harrier aircraft also possessed dedicated land attack capability. INS Vikramaditya (Russian-built), at 45,000 tonnes, is a medium-sized STOBAR-type aircraft carrier, capable of both fleet air defence and land attack, carrying up to 30 aircraft and helicopters. INS Vikrant IAC-1) is almost similar in size, classification, role and capability to INS Vikramaditya.

The commissioning of INS Vikrant in September this year demonstrated India's capability to design and build the largest and most complex of warships, a capability held only by few countries. The planning for IAC-I, as it was called before commissioning, began in the mid-1980s. There were several iterations by the Indian Navy's Design Directorate before the plan was finalised and government approval obtained for construction in 2002. Built with indigenous steel developed by the Defence Research and Development Organisation, its keel was laid in 2009 and the ship launched in 2013. Sea trials began in August 2021 and the ship was commissioned on September 2, 2022.

The elaboration of this timeline is to show the time and the effort that went into the design, construction and trials of India's first indigenous aircraft carrier. This time period can, of course, be shortened considerably if the next carrier is a repeat order. The expertise gained from the design and the construction of IAC-I will also enable faster development if a new and larger ship design is approved by the Government. Due to the smaller and relatively less capable air wing carried on its first four carriers, as compared to other carrier-capable navies, the Indian Navy envisaged a medium-sized CATOBAR aircraft carrier in the region of 50,000 tonnes-65,000 tonnes, as a follow-up to INS Vikrant.

This is the tonnage of aircraft carriers operated by advanced navies such as the United Kingdom, Russia, China and France — with only the U.S. Navy operating nuclear-powered super-carriers of tonnage greater than 1,00,000 tonnes. Various constraints, principally financial in nature, seem to have curbed India's ambitions. However, the fall-back plan for a repeat order would ensure that valuable infrastructure, design capability, ship-building expertise and the indigenous industrial ecosystem, built through extensive investment and effort over two decades, are not lost.

It would also ensure that India finally achieves the goal of having three aircraft carriers — a target that has remained elusive since the first Naval Plan Papers in 1948 stipulated the need for three aircraft carriers for the Indian Navy. Having two aircraft carriers of similar design and configuration would also make their operation/maintenance easier.

China's ambitions

However, in the long term, India should not lose sight of the fact that China's first two aircraft carriers displace over 65,000 tonnes, and its third indigenously designed and built carrier, Fujian, displaces 85,000 tonnes, with a possible air wing of 60-odd aircraft. China's future plans for a

seven-ship carrier force include ambitions to build nuclear-powered super-carriers of over 1,00,000 tonnes displacement, with construction reportedly having commenced in 2017.

As a major emerging global power, with an inimical China at its doorstep, India can ill-afford to fall behind in its sea control and maritime deterrence capability, exemplified by an aircraft carrier-centric navy. While aircraft carriers are designed for ‘arrested recovery’ of aircraft, India should not allow the development of its aircraft carrier programme itself to be ‘arrested’.

<https://www.thehindu.com/opinion/op-ed/a-warship-programme-that-must-go-full-steam-ahead/article66307731.ece>



Mon, 26 Dec 2022

BHELSIA Evaluates Cluster-based Approach to Increase Utility of Defence Acquisition Procedure (DAP) 2020

BHEL Small and Medium Industries Association (Bhelsia), the association established by Bharat Heavy Electricals Limited (BHEL) vendors and suppliers, is evaluating cluster-based approach to increase the utility of MSME-friendly Defence Acquisition Procedure (DAP) 2020 and help revive sick MSME units as per a report by The Hindu. In line with Atmanirbhar Bharat initiative, DAP enables the procurement and acquisition of upgraded technology, products and services for the Tri-Services and other allied defence services. Under the economic support package for MSMEs, the union government doesn't allow global tenders to bid for government procurement up to Rs 200 crore.

The industry association opines that consideration of clusters as units has the potential to meet the turnover eligibility of the MSME sector in order to cater to the Defence sector. Appealing to the Central and state governments to renew life into the sick MSMEs, Rajappa Rajkumar, President, BHELSIA said, “There are strong signs of revival of MSME sector in Tiruchi region. The progress could be leveraged further by securing orders from Defence equipment manufacturers on a cluster basis,” BHELSIA. Till date, 35 units have been categorised as sick out of which 25 have the potential to be rekindled if the Tamil Nadu government serves the intended purpose in the upcoming meeting of State Level Bankers Committee, said Rajkumar. He also highlighted that the struggling MSME units who have already created capacity and expertise can have higher utility as compared to newly incorporated units. He underlined the fact that BHEL's ancillary units had a high degree of capability for catering to the defence sector.

The Department of Defence Production, Ministry of Defence is running the DAP scheme for promotion of MSMEs, under the Make in India initiative of the Central Government with the aim to bring the sector into the defence supply chain and promote self-reliance in the country in defence.

The Department provides related information through workshops and conclaves to MSMEs from non-defence sectors who want to foray in the defence sector, under the scheme. Moreover, MSME vendors can also access information regarding the opportunities in the Defence

Procurement Procedure, especially the Make II procedure before linkage with Original Equipment Manufacturers, and Defence Public Sector Undertakings. According to data from Defense Ministry, procurement by DPSUs (Defence Public Sector Undertakings) from MSMEs stood at Rs 5,463 crore during 2020-21, the report mentioned.

<https://www.financialexpress.com/industry/sme/msme-eodb-bhelsia-evaluates-cluster-based-approach-to-increase-utility-of-defence-acquisition-procedure-dap-2020/2927197/>



Mon, 26 Dec 2022

First India-Central Asian NSAs Meeting Focused on Connectivity and Regional Security

By Dr Pravesh Kumar Gupta

Relations between India and the Central Asian republics (CARs) have strengthened after Prime Minister Narendra Modi visited these nations in 2015. Further, by signing a memorandum of obligations in Tashkent, Uzbekistan, in June 2016, New Delhi formally started the process of joining the SCO as a full member. The SCO has given New Delhi an essential forum for constant discussions with Central Asian nations on the sidelines of SCO meetings. In continuation of its outreach to the region, India-Central Asia Dialogue at the foreign ministers level was started in January 2019. Furthermore, initiating a leaders' summit between New Delhi and the CARs in January 2022 has enhanced multilateral cooperation between India and Central Asia.

As a result of the First India-Central Asia Summit, at which all leaders agreed to hold regular meetings between the heads of national Security in their respective countries, the National Security Advisors/Secretaries (NSAs) of India and Central Asian countries met for the first time in Delhi on December 6, 2022. Mr. Ajit Doval, India's National Security Advisor, chaired the meeting, which was attended by his counterparts from five Central Asian nations, except for Turkmenistan, which was represented by its ambassador in New Delhi, MR Shalar Geldynazarov.

Regional security challenges took centre stage in the discussion. Tajikistan, Turkmenistan, and Uzbekistan all border Afghanistan directly. Therefore, any developments there affect all three of those nations. Similarly, the Af-Pak region seriously threatens India's domestic Security. As a result, the decision to schedule regular meetings between the national security chiefs of India and the CARs is a big step toward enhancing cooperation on issues like connectivity and common security challenges.

The NSAs released a joint statement after their meeting that concentrated on regional security challenges, including Afghanistan and counterterrorism. They criticised all forms and manifestations of terrorism and emphasised the need for effective cooperation in the struggle against the danger presented by terrorism. Participants emphasised the necessity of teamwork in the fight against terrorism and the funding of terrorism, as well as the fact that terrorists shouldn't be trained or harboured in countries like Afghanistan. Ajit Doval, the NSA of India, also spoke on the importance and relevance of UN Security Council Resolution 2593, which

aims to stop the Taliban-led Afghanistan from becoming a haven for terrorists and a breeding ground for terrorism that might endanger other nations, including India.

Given the humanitarian disaster that has resulted from the Taliban's rule, NSAs agreed to coordinate to assist Afghanistan. Despite its unwillingness to connect with the Taliban leadership, India has sent food grains and medicines to Afghanistan. Similarly, Central Asian nations, notably Uzbekistan, have been working together to expedite the delivery of humanitarian supplies to Afghans through its UN-recognized international transport and logistical centre at Termez.

Connectivity is another problem that has long impeded ties between India and Central Asia. India invested in the Iranian port of Chabahar and the international North South Transport Corridor (INSTC) to address the connectivity issue. The Ashgabat Agreement, which facilitates the movement of products among members, was also signed by New Delhi. Connectivity between India and Central Asia remains delayed despite numerous initiatives. The NSAs/Secretaries of Central Asia who participated in the meeting agreed that greater connectivity must be given high priority to increase economic and commercial links between India and the region. They also concurred that connectivity projects should respect all nations' territorial integrity and sovereignty, be accessible to various participants, and be financially sustainable. This was an allusion to China's Belt and Road project (BRI).

The present Taliban administration in Kabul has commended India for hosting the first gathering of Central Asian national security advisers. Furthermore, it said that no agency or authority would be permitted to utilise its territory to intervene in the internal affairs of another country. The Taliban leadership has supported the plan to boost regional security cooperation. It also backed a joint declaration favouring a secure, united, peaceful, and stable Afghanistan.

The importance of the summit was covered extensively in the Central Asian media outlets as well. According to the President of Kazakhstan's official website, the Republic of Kazakhstan's initiative to establish a Network of Regional Centers for Disease Control and Biosafety under the auspices of the UN, as well as to establish a particular multilateral body – the International Agency for Biological Safety (IABS) – was a significant initiative that all other participants had taken note of. Another Central Asian nation, Kyrgyzstan, declared 2022 to be the year of sustainable mountain development, while Uzbekistan emphasised the significance of the Multifunctional Transport and Logistics Hub in Termez for the delivery of humanitarian supplies to Afghanistan.

The meeting of national security advisers from India and Central Asian nations addressed some important issues. It opened up a new line of communication between Delhi and CARs, which is essential for assessing bilateral and multilateral ties. As was previously said, it resulted from the first leaders' summit between India and Central Asia. As a result, New Delhi must continue to promote expanding cooperation with Central Asia through all of its communication channels.

<https://www.financialexpress.com/defence/first-india-central-asian-nsas-meeting-focused-on-connectivity-and-regional-security/2926943/>

India, China Harden Defences: Border Line of No Actual Control

By Manu Pubby

The uneasy calm that prevailed on the border with China this year shattered with a bloody clash in Yangste at a snow-clad mountain ridge this month, with hundreds of soldiers deployed for months at high altitude engaging in a medieval brawl involving sticks, stones and locally crafted tazers. The incident encapsulates the origin, current status and dangers of the wider border row with China that started in 2020. And it is a clear indication that the new normal will include sporadic clashes, build-up of tension and creation of new border flashpoints by an assertive China. The clash, which erupted after close to 350 Chinese soldiers approached Indian positions with an intention to dismantle forward observation posts, had been brewing for months. Over the past year, China has been steadily increasing its presence across Indian positions in Tawang. This has included development of new, hardened roads, defensive positions and pushing in additional soldiers.

The Tangwu New Village, portrayed as a civilian settlement but in reality is a semi-military garrison, was the staging point for the clash at Yangste. The Chinese aim, it seems, was to take down Indian positions that can keep a check on Tangwu and call in for reinforcements in the face of provocative action. Smaller clashes have occurred at the location in the past but in December, China sent in an extraordinarily heavy troops, aiming to change the status quo before heavy snowfall makes access almost impossible.

The action was thwarted with the presence of a larger body of Indian troops, with local commanders managing to predict the Chinese assault on the ridge, assisted by enhanced domain awareness thanks to the generous deployment of reconnaissance and surveillance assets on the LAC.

Width of the Problem

The Yangste flashpoint follows a model that has emerged at several locations on the disputed border with China. With enhanced connectivity to forward locations and with new roads and bridges, Chinese troops have been attempting to assert control over disputed areas which used to be barely patrolled in the past. This has prompted an Indian reaction of increased troop deployment, creation of new defences and infrastructure and significant investments in equipment to detect and deter the opposing force.

Yangste is just one of the eight border flashpoints in Arunachal that have been kept active by the Chinese side. But the problem persists beyond the borders of the northeastern state. Similar flashpoints, where active Chinese provocations continue, are present in Sikkim and the Doklam plateau, Barahoti in Uttarakhand and multiple points of Eastern Ladakh.

The entire Indian Army deployment from Karakoram Pass in Ladakh to the eastern tip at Kibithu, that consists of lakhs of troops, is on high alert to monitor and track Chinese moves close to the border. This is in addition to the strong Indian deployment at Siachen glacier, Kargil and along the entire Line of Control (LoC) against Pakistan in Jammu and Kashmir.

While border talks led to pulling back of troops at the Hot Springs (Ladakh) flashpoint this year, provocative actions persist at other locations, indicating that enhanced forward deployment of troops at high altitude areas will continue even through the winter months for the foreseeable future.

Provocative Action Persists

Before the large-scale clash at Yangste, smaller altercations and face-off between opposing patrols have taken place at regular intervals in Arunachal Pradesh. Only a few of these needed intervention from senior officials, including an incident where military stores were recovered after PLA troops retreated following a minor clash.

<https://economictimes.indiatimes.com/news/defence/border-line-of-no-actual-control/articleshow/96526500.cms>

THE ECONOMIC TIMES

Mon, 26 Dec 2022

How Japan's New National Security Strategy impacts Cooperation with India

Viewpoint

By Dr. Satoru Nagao

Japan has published its National Security Strategy, National Defense Strategy and another document on arms procurement. After Shinzo Abe was sworn in as prime minister a second time in 2012, Japan established the National Security Secretariat in the government and made the first National Security Strategy that it published in 2013. Nine years on, comes the second National Security Strategy along with National Defence Strategy and Defense Program Plan. Compared to the last National Security Strategy, these documents clearly delineated the threats faced by Japan, and the requisite changes to its security strategy.

Firstly, and most importantly, the National Security Strategy identified which countries are threats and friends. Japan picked three countries as challengers - at the top is China, the second is North Korea and the third is Russia. In 2013, the previous National Security Strategy had mentioned North Korea first and China second, despite which, PM Abe published an article "Asia's Democratic Security Diamond" which urged the formation of QUAD to deal with China. This means that in 2013, the Japanese government except PM Abe hesitated to call China as the top challenger to Japan. But in 2022, Japan decided to identify China as the topmost.

The interesting part is about friends. Leaving aside the US, both the National Security Strategy and National Defence Strategy listed friends. At the top is Australia, second is India, the third are the UK, France, Germany and Italy or South Korea. In the past, South Korea's status was higher. But now, Australia and India are a priority for Japan, the documents said. In the case of India, the two countries are planning joint fighter jets exercises. And there is a possibility that India will import Japan's UNICORN for their naval ships. The defence ministries of both countries have already started a joint arms development project for unmanned vehicles.

This is very important because recently, India and Japan have had many differences in stances. Originally, PM Abe was the main promoter of India-Japan relations. He was assassinated in July

this year. Since then, Japan has not found anyone to promote this relation. Apart from this, the policy toward Russia also divided India and Japan. When Japan asked India to permit transport planes of the Japan Self Defence Force to land in India and carry UN stocks to support Ukraine, the Indian government refused permission to land. This disappointed the Japan Self Defence Forces deeply. In addition, Japan tried to sell US-2 amphibious planes to the Indian Navy but failed. These disappointments in Japan's security circles recently affected cooperation with India. Therefore, the National Security Strategy identifying India as a priority partner will motivate and encourage more cooperation between India and Japan.

Secondly, these documents clearly indicated that Japan would possess a counter strike capability. Indeed, this is related to India. India, Japan, and Australia have recently been seeking enhanced strike capabilities. In July 2020, Australia announced its intent to possess long-range strike capability. Under the AUKUS, Australia will possess nuclear submarines with long-range cruise missiles. Australian conventional submarines will equip tomahawk cruise missiles, too. India also deployed supersonic cruise missiles in the India-China border area. India also tests missiles with hypersonic missile warheads. Indeed, Taiwan, Vietnam, the Philippines, and South Korea are also increasing their arsenal to strike.

The long-range strike capability is effective when these countries face China's territorial expansion. For example, if both India and Japan possess long-range strike capabilities, this combined capability makes China defend multiple fronts. Even if China resorts to adventurism along the India-China border, it will still need to expend a certain amount of its budget and military assets to defend itself against Japan (with the US and Australia in this case).

Moreover, a long-range strike capability is useful to secure the route China would use to expand its territories. If the straits or other choke points are under the range of India-Japan-US-Australia's strike capability, China may not have the confidence to use them. This situation is similar in the mountainous India-China border area. India can attack strategic bridges, tunnels, or airports anytime using missiles. This reduces China's ability to use these strategic routes. Therefore, this counter-strike capability is multi-beneficial for India, Japan, the US, Australia and other allies and partners.

Thirdly, these documents clearly mention that Japan will increase ODA for strategic purposes. The document says, "For the purpose of deepening security cooperation with like-minded countries, apart from ODA for the economic and social development of developing countries and other purposes, a new cooperation framework for the benefit of armed forces and other related organizations will be established." This document clearly mentioned that Japan will be a security provider for countries that face China's territorial expansion.

Indeed, this is an important promoter for the India-Japan arms trade. When India planned to import Japan's US-2 amphibious planes, the price was too expensive. But Japan cannot use ODA for discounts. If there is a new cooperation framework, there is a possibility the price may change.

Currently, India needs infrastructure projects in the border area with China. But Japan cannot use ODA to support infrastructure in Arunachal Pradesh or Ladakh because ODA cannot be used for military purposes. However, if there is a new cooperation framework, there is a possibility that Japan can provide heavy machines to build roads in this region even if these are for military purposes.

Therefore, these new documents show a big potential of India-Japan and QUAD cooperation with the US and Australia. The more China escalates the situation, the more the QUAD could become institutionalized and cohesive.

<https://economictimes.indiatimes.com/news/defence/view-how-japans-new-national-security-strategy-impacts-cooperation-with-india/articleshow/96516738.cms?from=mdr>

ThePrint

Mon, 26 Dec 2022

Japan Raises Military Budget to Counter China's Assertiveness: Report

In order to counter China's assertiveness, Japan has raised its military spending to record levels, reported The Singapore Post. Japan's new National Security Strategy pledged to increase its defence budget from 1 per cent of GDP to 2 per cent. The Kishida government approved a record USD 862 billion budget for the 2023 fiscal year, with a large portion earmarked for defence spending amid rising regional security challenges from China. The budget includes USD 277.6 billion for social security and USD 51 billion for the military, a 26.3 per cent increase from USD 40.6 billion in the current defence budget, reported Kyodo News.

The government recently approved three key defence policy initiatives, including the National Security Strategy, which refers to China as Japan's "greatest challenge." The move is widely seen as a departure from Japan's post-war constitution, which renounces war or the use of force in settling international disputes. But Japanese Prime Minister Fumio Kishida said that Japan would maintain its exclusively defence-oriented policy, which states that defensive force could only be used in the event of an attack, reported The Singapore Post. The increase in military spending brings Japan into the third position globally regarding military spending, behind the United States and China.

The defence budget includes expenditures for the improvement and mass production of the Ground Self-Defense Force's surface-to-ship guided missiles, which are expected to be a key component of Japan's counterstrike capabilities. Other items on Japan's military spending list over the next five years include high-speed glide weapons, hypersonic missiles, surveillance drones, and US-made Tomahawk missiles. The budget also accounts for expenses related to hosting US military bases, according to local reports, reported The Singapore Post.

Japan seeks to have the ability to counterattack as it deals with regional security challenges from China, North Korea, and Russia. Japan is concerned about its own vulnerability as China expands its military presence near Taiwan and the East China Sea. The Chinese Communist Party (CCP) regime had not ruled out using force to bring Taiwan under its control.

Other nations, including the Philippines, have also raised concerns over the CCP's military activities. The Philippines Defence Ministry is also strengthening its military to prevent the Chinese regime from encroaching on its territory in the contested South China Sea, which Beijing also claims, reported The Singapore Post. The Chinese regime seeks to conquer Taiwan through kinetic or non-kinetic action, which would put Japan's sea lanes and southernmost

islands at risk. Along with the South China Sea and South Korea, Japan is a potential next target, after Taiwan, for an expanding China.

The US Ambassador to Japan, Rahm Emanuel, responded, “the Prime Minister is making a clear, unambiguous strategic statement about Japan’s role as a security provider in the Indo-Pacific.” The Japanese military is investing in new counterstrike missiles, including a surface-to-ship missile developed by Mitsubishi, purchases of US Tomahawk cruise missiles, and the ability to coordinate with the United States in long-range delivery of ordnance to Chinese military bases. China and Russia’s de facto alliance with North Korea drives Tokyo’s increased focus on defence. Pyongyang lobbed a suspected nuclear-capable ballistic missile over Japan in October, prompting a Japanese order that residents take cover, reported The Singapore Post.

<https://theprint.in/world/japan-raises-military-budget-to-counter-chinas-assertiveness-report/1283551/>

THE ECONOMIC TIMES

Tue, 27 Dec 2022

Taiwan to Extend Compulsory Military Service on China Threat - Government Source

Taiwan will announce on Tuesday a plan to extend compulsory military service to one year from the current four months, according to a senior government official, as the island deals with rising Chinese military pressure. The office of Taiwan President Tsai Ing-wen said she will call a national security meeting on Tuesday morning to discuss reinforcing the island's civil defence, followed by a news conference on unspecified new civil defence measures. Tsai's security team, including high-level officials from the defence ministry and the National Security Council, has been reviewing Taiwan's military system since 2020 amid fast-rising Chinese threats, according to the official, who declined to be named because the information was private. "China's various unilateral behaviours have become a major concern for regional security," said the person, who took part in the high-level security discussion. The military reform would also include boosting training for conscripts, such as introducing combat instruction used by U.S. forces and strengthening shooting exercises, the official said, adding that the new system is scheduled to go into effect in 2024.

Taiwan's defence ministry declined to comment. The official Central News Agency, citing government and ruling party sources familiar with the matter, first reported late on Monday that her government would on Tuesday announce the plan to extend compulsory military service. Taiwan has been gradually shifting from a conscript military to a volunteer-dominated professional force, but China's growing assertiveness towards the island it claims as its own, as well as Russia's invasion of Ukraine, have prompted debate about how to boost defence. Russia calls the war a "special operation".

Taipei, which rejects Beijing's sovereignty claims, on Monday reported the largest-ever Chinese air force incursion into the island's air defence identification zone, with 43 Chinese planes crossing an unofficial buffer between the two sides. China also staged war games near Taiwan in August following a visit to Taipei by then-U.S. House Speaker Nancy Pelosi. Previous governments under the ruling Democratic Progressive Party and the main opposition

Kuomintang cut compulsory service for men from more than two years to four months to please younger voters as tensions eased between Taipei and Beijing.

Tsai is overseeing a broad modernisation programme, championing the idea of "asymmetric warfare" to make the island's forces more mobile, agile and harder to attack. China has stepped up its diplomatic, military and economic pressure in recent years on the self-governed island to accept Beijing's rule. Taiwan's government says only Taiwanese people can decide their future and vows to defend itself if attacked.

<https://economictimes.indiatimes.com/news/defence/taiwan-to-extend-compulsory-military-service-on-china-threat-government-source/articleshow/96532060.cms>

Business Standard

Mon, 26 Dec 2022

47 Chinese Military Aircrafts Enter Air Defence Zone, Claims Taiwan

A total of 71 Chinese air force planes and seven ships were spotted around Taiwan with 47 military aircraft of China detected to have crossed the median line of the Taiwan Strait, to enter Taiwan's southwest Air Defence Identification Zone (ADIZ), Taiwan Defence Ministry said on Monday. The incursions, according to Taiwan, were made by aircraft, including 12 J-11, 6 J-10, 18 J-16, six SU-30, CH-4, WZ-7, Y-8 EW, Y-8 ESW and KJ-500. It further said that its armed forces monitored the situation and stated that its aircraft, navy vessels and missile systems have been tasked to respond to these activities.

The Chinese military's Eastern Theater Command had on Sunday announced that it carried out joint combat readiness patrol and "strike drills" around Taiwan, according to CNN. Taiwan Defence Ministry in a tweet said, "71 PLA aircraft and 7 PLAN vessels around Taiwan were detected in our surrounding region by 6 a.m.(UTC+8) today. R.O.C. Armed Forces have monitored the situation and tasked CAP aircraft, Navy vessels, and land-based missile systems to respond these activities."

In another tweet, Taiwan's Defence Ministry said, "47 of the detected aircraft (J-11*12, SU-30*6, CH-4 UCAV RECCE*1, J-10*6, J-16*18, Y-8 EW*1, Y-8 ASW*1, KJ-500*1, WZ-7 UAV RECCE*1) had crossed the median line of the Taiwan Strait and entered Taiwan's southwest ADIZ, flight paths as illustrated."

On Sunday, the Chinese military's Eastern Theater Command said that the "strike drills" and joint combat readiness patrol were carried out in response to "provocations" between Taiwan and the United States, as per the CNN report. The announcement of China comes after US President Joe Biden signed a new defence bill into law which included creating a defence modernisation program for Taiwan to deter Chinese offensive. "The troops will take all necessary measures to resolutely defend national sovereignty and territorial integrity," CNN quoted China's Eastern Theater Command as saying. In a statement on Sunday night, the Taiwanese Defence Ministry asserted that it has confidence in defending its sovereignty. According to CNN, the Taiwanese Defence Ministry said, "The actions of the Chinese Communist Party highlighted its mentality of using force to resolve differences, which undermines regional peace and stability."

Notably, the tensions between Taiwan and China increased after the US House of Representatives Speaker Nancy Pelosi visited the island in August. China had raised objections to Pelosi's visit to Taiwan, which China claims as part of its territory.

https://www.business-standard.com/article/international/47-chinese-military-aircrafts-enter-air-defence-zone-claims-taiwan-122122600287_1.html



Tue, 27 Dec 2022

Ukrainian Drone Attack at Russian Base Exposes Vulnerabilities in Russia's Air Defence

The latest strike to expose vulnerabilities in Russia's air defence involved a drone thought to be Ukrainian that crossed hundreds of kilometres through Russian airspace and exploded fatally near the main base for Moscow's strategic bombers. The drone crashed at the Engels air base, killing three military members, and Russia has claimed responsibility for shooting it down. Ukraine stayed silent in accordance with its standard procedure about occurrences inside of Russia. The base is hundreds of kilometres from the Ukrainian border and serves as the primary airport for the bombers that Kiev claims Moscow has been using recently to attack Ukrainian civilian infrastructure. As part of Russia's long-term strategic deterrent, the same aircraft are also built to deploy nuclear-capable missiles.

No planes were damaged, according to a statement from the Russian defence ministry, but several were reportedly destroyed if unverified Russian and Ukrainian social media posts are to be believed. On December 26, Russian President Vladimir Putin hosted leaders of other former Soviet governments in St. Petersburg for a summit of the Commonwealth of Independent States organisation, which Ukraine has long since left. Without specifically mentioning the war, Putin said in televised remarks that dangers to the security and stability of the Eurasian region were growing.

Vladimir Putin earlier emphasised that Russia was striving for a rapid resolution and said he believed the war in Ukraine should stop as soon as possible. The conflict's resolution is the Russian President's primary objective, he told reporters. The earlier the better, he added. It was said shortly after Ukraine President Volodymyr Zelenskyy's trip to America. US President Joe Biden expanded arms shipments and committed to providing Patriot surface-to-air missiles as part of the US's greatest commitment to Ukraine to date. On December 22, Biden welcomed the president of Ukraine with a high-profile VIP welcome.

Russia's established dominance over the other former Soviet states has been put to the test by its invasion of Ukraine. In a situation where Russia has peacekeepers on the ground, fighting has risen recently between CIS members Armenia and Azerbaijan, while a border dispute has broken out between Kyrgyzstan and Tajikistan.

<https://www.livemint.com/news/world/ukrainian-drone-attack-at-russian-base-exposes-vulnerabilities-in-russia-s-air-defence-11672108284187.html>

Mon, 26 Dec 2022

Czech Army Unveils New Indigenous STARKOM Tactical Communication Jammer

Janes has learnt details of the STAVEbnicový Rušič KOMunikační (Modular Communication Jammer: STARKOM), one of the main components of a mobile electronic warfare (EW) system. The first STARKOM system was delivered to the Czech Army's 53rd Reconnaissance and Electronic Warfare Regiment in mid-October. The system was developed and manufactured entirely in the Czech Republic in only three years. The main contractor is the state-owned VVU Brno military research institute, with the software (SW) and key hardware components related to EW provided by specialised Czech jamming systems manufacturer URC Systems, supported by systems engineering company JISR Institute.

STARKOM is a modular tactical jammer mounted on a Tatra Force T-815-7T3RC1 8×8 chassis with an extended wheelbase designed to jam aerial and land targets on the operational-tactical level. It jams enemy analog and digital voice and data communications in the very-high-frequency/ultra-high frequency/super-high frequency (VHF/UHF/SHF) bands, including Global System for Mobile communication (GSM) bands of mobile networks. It has the ability to counter including modern frequency-agile systems such as frequency-hopping ones. The system is not only used for powerful jamming across the tactical waveband for electronic countermeasures but can also be used for electronic support measures as a radio reconnaissance, direction-finding, and surveillance sensor that can conduct a detailed analysis of enemy radio signals.

The jammer's electronic protective measures capability facilitates jamming of radio-controlled improvised explosive devices (RCIEDs) triggered from various sources, covering all frequency spectrums of, for example, commercial radios, radio-controlled models, mobile phones, WiFi, and unmanned aerial vehicles (UAVs). STARKOM was designed from the outset with high mobility in mind to maximise its survivability on the battlefield during high-intensity combat. It is therefore equipped with rapidly extendable electronically controlled telescopic masts with antennas and an integrated power unit in the vehicle. The four-seat cabin and the rest of the vehicle have ballistic protection and are fitted with a mobile sandwich-type multispectral camouflage net as standard. Self-protection against UAVs and RCIEDs also functions while the vehicle is in motion.

STARKOM software includes the SYMON SW 3 radio reconnaissance and tracking system, the AKRS RT radio signal analysis and classification application, and the Electronic Warfare Management (EWMAN) EW command-and-control (C2) application.

SYMON SW 3 is a modular solution for the electronic monitoring of radio traffic, including detection and identification. Based on technical analysis of radio signals, identification is performed automatically or can be performed offline with database and 2D/3D geographic support. The SW detects and stores any signal in the frequency band of interest and performs control of one or more preset frequency or frequency bands. The results then go through an activity detection process that can be transferred to the identified frequencies recording module, which stores them in a database. AKRS RT is a versatile tool for technical analysis,

classification, and decoding of digitised radio signals, as well as defining and presetting the correct interference signal. It is equipped with a database of known signal types and can perform online analysis (monitoring the spectral activity of the channel and performing recordings), offline analysis (detailed technical analysis of radio transmission parameters of recorded signals – software-defined radio (SDR), demodulation, parameter detection, and visualisation), and real-time analysis (real-time processing of the data stream). Other features include classification of detected signals based on their detailed technical characteristics for system identification with the possibility of then creating a database of devices and sample signals. AKRS RT can also be used for the identification of radio traffic in the frequency spectrum, processing radio signals of known and unknown standards, interpretation of transmitted information for selected standards, measurement of signal parameters for optimal jammer settings, export of selected parameters and transmitted data for deception purposes, real-time frequency modulation (FM) radio surveillance, including radio data system information, image visualisation of analog imaging systems (for example, analog TV and metrology fax), and export of a demodulated signal or symbols for further processing in third-party applications (MATLAB).

Jamming Control Management (JAMCOM) SW, an application for controlling the entire jamming process, provides tools for creating jamming signals from the oldest types of signals such as analog signals up to the most modern types of signals such as modulation of digital signals from the data level up to the settings of digital modulation parameters. In this case, the jamming signal does not have to be used just for simple jamming but can also be used for the deception of enemy communication systems. This SW is also designed to control all jamming components of the STARKOM system.

EWMAN SW is an application SW that provides tools to support activities in the EW co-ordination cell (EWCC) command post and subordinate EW units. It is a Windows-based application with a graphical user interface that supports standardised APP-11 text messages and NATO Vector Graphic (NVG) formatted operational drawings. It visualises all data over a map base and supports Web Map Service (WMS) map layers. The basic functions of EWMAN SW include tasking and co-ordination of subordinate EW elements, receiving their data, and then displaying this overlay over the base map. The system also provides analytical tools for analysing EW data, creating reports based on analysed data, creating plots, solving optical and radio visibility tasks, distributing reports and plots to commanding EW and C2 elements, and distributing the resulting EW products to the coalition database.

<https://www.janes.com/defence-news/c4isr-command-tech/latest/czech-army-unveils-new-indigenous-starkom-tactical-communication-jammer>



Mon, 26 Dec 2022

South Korea Fires Warning Shots after North Drones Cross Border

South Korea's military fired warning shots and scrambled aircraft after North Korean drones entered the South's airspace on December 26, South Korean officials said, days after the North

launched two ballistic missiles in its latest testing activities. “Several North Korean drones crossed the inter-Korean border and were detected in the South’s territory on Monday morning,” South Korea’s Defence Ministry said.

South Korea’s military broadcast warnings and fired warning shots before it launched fighter jets and attack helicopters to shoot down the North Korean drones, the Defence Ministry said. It wasn’t immediately known if the drones were shot down. South Korea’s military fired warning shots and scrambled aircraft after North Korean drones entered the South’s airspace on December 26, South Korean officials said, days after the North launched two ballistic missiles in its latest testing activities. “Several North Korean drones crossed the inter-Korean border and were detected in the South’s territory on Monday morning,” South Korea’s Defence Ministry said. South Korea’s military broadcast warnings and fired warning shots before it launched fighter jets and attack helicopters to shoot down the North Korean drones, the Defence Ministry said. It wasn’t immediately known if the drones were shot down.

It’s the first time for North Korean drones to enter South Korean airspace since 2017, when a suspected North Korean drone was found crashed in South Korea. South Korean military officials said at the time that the drone photographed a U.S. missile defence system in South Korea. North Korea has previously touted its drone programme and South Korean officials said the North has about 300 drones. In 2014, several suspected North Korean drones were found south of the border. Experts said they were low-tech but could be considered a potential security threat.

Last Friday, North Korea fired two short-range ballistic missiles toward its eastern waters, according to South Korea’s Joint Chiefs of Staff. The launch was seen as a protest of the South Korean-U.S. joint air drills that North Korea views as an invasion rehearsal.

This year, North Korea has conducted an unprecedented number of missile tests in what some experts call an attempt to improve its weapons and pressure rivals to make concessions such as lifting sanctions in future negotiations. Recently, the North also claimed to have performed major tests needed to acquire its first spy satellite and a more mobile inter-continental ballistic missile capable of reaching the U.S. mainland.

<https://www.thehindu.com/news/international/south-korea-fires-warning-shots-after-north-drones-cross-border/article66306635.ece>

euronews.

Mon, 26 Dec 2022

AI Cyber Attacks are a ‘Critical Threat’. This is how NATO is Countering Them

Artificial intelligence (AI) is playing a massive role in cyber attacks and is proving both a “double-edged sword” and a “huge challenge,” according to NATO. “Artificial intelligence allows defenders to scan networks more automatically, and fend off attacks rather than doing it manually. But the other way around, of course, it’s the same game,” David van Weel, NATO’s Assistant Secretary-General for Emerging Security Challenges, told reporters earlier this month.

Cyber attacks, both on national infrastructures and private companies, have ramped up exponentially and become a focal point since the war in Ukraine. NATO said this year that a cyber attack on any of its member states could trigger Article 5, meaning an attack on one member is considered an attack on all of them and could trigger a collective response.

AI-based tools can be used to better detect and protect against threats, but on the other hand, cybercriminals can use the technology for more sporadic attacks that are harder to defend against because there are so many of them simultaneously. AI can be used to try and break into networks by using credentials and algorithms to crack systems, said van Weel. Trying to solve the combinations “is a huge challenge,” he said, adding, “we of course want to be ethical users of AI”. He said AI will be used for defence “but we can't guarantee of course that our opponents, who are the ones trying to break in, are using AI in the same ethical manner”. “That's something we need to take into account in our defence. It's definitely something we're watching”.

Cyber defence put to the test

Just how to defend against AI cyber attacks is what is being tested in Estonia's capital Tallinn at the CR14 NATO Cyber Range. Earlier this month, army commanders from over 30 countries (not all of them NATO members) descended on the cyber range to put their skills to the test on how they would defend their country while working with their allies. Fictitious storylines were created and one of the biggest challenges of the annual event was dealing with the threat of AI attacks.

“In the AI experiment, it's basically a two-way street. It's recognising AI that is used by opponents and it's on the other hand, exploring how AI may support our own operations,” said Bernd Hansen, Branch Head of Cyberspace at the NATO Allied Command Transformation. “We expose the technical experiments to the operational community to ensure that what we try to develop from a technical perspective actually serves the operator - so that we don't march left when they would like us to march right,” he told Euronews Next.

The exercises have helped those participating but there is still a long way to go to counter the threat. AI is “definitely a robust problem that I think the cyber community is addressing,” said Candace Sanchez, USA lead executive planner who participated in the cyber exercises. “But I think it's going to take some time to really try to counter that threat. So working together in those efforts to try to do so, I think will help us move along,” she told Euronews Next.

The price of Internet freedom

AI cyber attacks can be used not just to shut down infrastructure but also to exploit information, said Alberto Domingo, technical director of cyberspace at NATO Allied Command Transformation. “I think AI is a critical threat. The number of attacks is increasing exponentially all the time,” he told Euronews Next, adding that at the moment the world is simply “living with these attacks” and needs more cybersecurity rules. “We are not yet at a stage where we identify that this is simply not acceptable. These behaviours cannot be allowed in cyberspace,” he said.

“It shows you that we still don't have a collective common approach to react to those things, but those things are simply not acceptable”. Although solutions are being worked on to tackle AI cyber attacks, Domingo said we cannot stop them if we still want the Internet to be a place of free thinking and independence. “We have created cyberspace in a way that is open to everybody. It's an environment for developing ideas. That's what we want. We want freedom in

cyberspace,” he said, adding that stopping that in favour of limiting what we can do on the Internet comes at too big a cost.

“The price we have to pay for that [Internet freedom] is to be realistic and accept that there will be attacks in the networks,” he said. “And the only way to cope with that is to use all the mechanisms and all the technologies included to protect, but also to react and also to recover from those attacks. I don't think we will ever be able to avoid them now”.

<https://www.euronews.com/next/2022/12/26/ai-cyber-attacks-are-a-critical-threat-this-is-how-nato-is-countering-them>



Mon, 26 Dec 2022

Flying Cars for US Air Force! USAF Trains to Fly ‘Electric Cars’; First eVTOL Service to Begin by 2023

By Tanmay Kadam

The US Air Force (USAF) is training to fly an electric ‘flying car,’ called the HEXA electric vertical takeoff and landing (eVTOL) aircraft, as part of the service’s ambitious Agility Prime program. On November 16, the Lift HEXA eVTOL lifted off at Duke Field for its first flight piloted by the USAF Airmen, who remotely controlled the aircraft during multiple takeoffs, flights, and landings.

The USAF said in a statement that this was an early step in creating a training program to incorporate airmen into the aircraft’s flight operation. The training’s objective was twofold. First, to validate the HEXA’s training program by having the airmen execute it in a controlled test environment, and second, to serve as a proof of concept for developing responsive training for government operators on uncrewed eVTOL aircraft. Participants included personnel from the 413th Flight Test Squadron, AETC Det 62, and AFWERX Agility Prime.

Agility Prime is an ambitious USAF program that seeks a highly modular eVTOL for various purposes, such as logistics and evacuation. AFWERX is a Technology Directorate of the US Air Force Research Laboratory (AFRL). “Successfully completing this training is a huge milestone and confidence boost to allow us to meet this challenge,” said Maj. Riley Livermore, 413th FLTS Futures Flight commander. During the two-week familiarization, the team began with classroom and simulator training before getting behind the controls of the HEXA aircraft. The flight requires a two-person team. One person controls the movement of the aircraft, while the other monitors the aircraft systems, batteries, outside variables, etc.

The USAF aims to deploy its first eVTOL for ferrying passengers or freight by 2023, for which the service has dedicated \$3.6 million to Agility Prime’s first procurement funds to lease ten eVTOL aircraft for exploratory use during fiscal 2023. So far, the program has 66 potential uses, including infiltrating and exfiltrating special operations forces (SOF) and rescuing downed aviators or other personnel from behind enemy lines, which could be a dangerous mission for traditional choppers. Agility Prime’s first real-world uses would probably involve supporting test and training ranges and other cargo transportation tasks. However, it could eventually play a role in wars.

HEXA Aircraft is among the first eVTOL aircraft that the USAF could acquire. Developed by Lift Aircraft, an eVTOL company based in Austin, Texas, HEXA is a single-seat multicopter weighing around 195 kilograms. It is propelled by 18 rotors, capable of flying up to around 24 kilometers, and carries a maximum of 136 kilograms. HEXA can be used for search and rescue, hauling small loads around bases, and emergency response. It appeared in this year's edition of the Emerald Warrior exercise at Hurlburt Field, Florida. According to founder and CEO Matt Chasen, Lift Aircraft is expecting some form of procurement contract from the USAF in 2023.

eVTOLs For USAF's Agile Combat Employment Concept

The USAF is particularly interested in how eVTOLs could help the service rapidly set up bases in a conflict zone as part of its Agile Combat Employment (ACE) concept. ACE is an operational concept developed to meet the increasing challenge of anti-access/area denial (A2/AD) capabilities fielded by near-peer adversaries like China and Russia. ACE involves leveraging networks of well-established and austere air bases, multi-capable airmen, pre-positioned equipment, and airlift to rapidly deploy, disperse and maneuver combat capability throughout a conflict zone.

Overseas US bases are vulnerable to the threat of thousands of ballistic and cruise missiles from China and Russia. For instance, China can strike the US military facilities located in the first and second island chains of the Western Pacific. "Moving parts in a base around quickly, sometimes it might require a transformative vertical lift because those airfields that need to be moved may be significantly damaged," Tekell said in an interview earlier this year. They "may not have runways anymore. They may not have roads anymore," he continued. While in the past, the USAF may have used legacy platforms like helicopters or tiltrotor aircraft to move equipment or supplies around when roads or other infrastructure were unusable.

However, Agility Prime's eVTOLs can perform these tasks more straightforwardly and fuel-efficiently in the future. Also, it would be much more economical than a traditional helicopter in procurement, operations, and maintenance. The ongoing Ukraine war has highlighted the importance of ACE, where Ukraine's Air Force has been able to keep the Ukrainian airspace contested, despite being outnumbered by the Russian Air Force. Russia boasts massive ballistic and cruise missiles that can strike any part of the world. Recognizing this threat, the Ukrainian fighter pilots adopted flexible tactics like keeping the aircraft moving from one airfield to another and flying difficult flight paths to reduce the chance of the enemy catching them on the ground.

Agility Prime Aims To Prevent China From Controlling eVTOL Supply Chain

Apart from ACE, the Agility Prime program aims to develop and accelerate the commercial market for advanced air mobility aircraft and create a domestic industry and supply chain to support their development and production. It is an effort to prevent China from poaching away this emerging market from the US as it did with the consumer drone market, with most of the world's drone supply chain moved to China. In 2020, USAF's then-assistant secretary for acquisition, Will Roper, admitted the failure of the Pentagon to take measures to seize the commercial drone market, leaving the US vulnerable to supply-chain risks.

"The Pentagon didn't take a proactive stance on it, and now most of that supply chain has moved to China," Roper had said to a group of reporters. "We probably could have kept part of the market here and not have the current security issues when someone wants to use a foreign-made

drone at an air force or service event,” he said. Therefore, the USAF is willing to consider any company that can reach the necessary technical and manufacturing requirements and looks at whether those aircraft’s capabilities would fulfill the variety of mission sets the USAF could need. So, it will not be a single company that will get one Agility Prime contract since the USAF is interested in promoting the growth of the eVTOL industry and supply chain in the US.

Apart from Lift Aircraft, the USAF currently has contracts with 14 companies to produce full-scale aircraft that could be used for Agility Prime, which includes producers of piloted eVTOLs, like Joby Aviation and Beta Technologies, and startups developing cargo drones like Elroy Air and Talyn. In March, two USAF pilots became the first airmen to fly an electric aircraft with military airworthiness when they took to the skies in Alia aircraft developed by Beta Technologies of Burlington, Vermont.

Alia aircraft can reach a range of 463 kilometers and a top speed of around 278 kilometers per hour. It can carry up to 566 kilograms of cargo. Notably, Agility Prime has provided the companies funding, government testing resources, and the potential to earn revenue on military sales before the Federal Aviation Administration gives them the green light to launch civilian service. For example, Northern California-based Joby Aviation has received contracts worth up to \$75 million through Agility Prime for R&D and unmanned flight testing. In November, the company told investors that it is in discussions with the USAF to deliver aircraft by 2024, as it disclosed the decision to push back its target date to launch urban air taxi services by a year to 2025 due to the slow pace of federal rule-writing that will govern the industry.

Joby’s four-passenger electric tiltrotor is designed to take off, land like a helicopter, and cruise on wings like an airplane as far as 241 kilometers.

<https://eurasianimes.com/new-usaf-story-flying-cars/>

Science & Technology News



Press Information Bureau
Government of India

Ministry of Science & Technology

Tue, 27 Dec 2022

Year-End Review -2022: CSIR (Ministry of Science & Technology)

- CSIR facilitated India’s First Ever Biofuel-Powered Flight paving the way for sustainable and alternative fuels when the first biofuel-powered flight was flagged off from Dehradun to Delhi. The bio-aviation fuel was produced indigenously by CSIR-IIP from Jatropha oil and was based on the patented technology of the institute. In a first, an IAF AN-32 aircraft powered with 10 percent blend of biofuel conducted flight operations at Leh, one of the highest airports in the world.

- CSIR launched the CSIR-Aroma Mission in 2016 which seeks to bring about transformative change in the aroma sector through interventions in agriculture, processing and product development for fuelling the growth of the aroma industry and boosting rural employment. Under this mission, 6000 hectares have been brought under cultivation, which involved 46 Aspirational Districts. About 44,000+ persons trained and 231 distillation units were set up and 500 tonnes of essential oil was generated.
- CSIR-NAL has successfully developed state-of-art Indigenous Autoclave Technology for processing advanced light weight composites that are integral to modern day civil and military airframes.
- CSIR-IIP and GAIL have developed a technology that can convert 1 tonne of plastic waste and other Polyolefin products into 850 litres of the cleanest grade of diesel.
- CSIR- IICT has developed a technology to manufacture hydrazine hydrate, which is used in agrochemicals, pharmaceuticals, and water treatment. The technology's pilot project was demonstrated at Gujarat Alkalies & Chemicals Ltd, Vadodara (GACL). On 10 October 2022, Shri Narendra Modi, Hon'ble Prime Minister of India dedicated to the nation, the 10,000 TPA commercial plant based on the IICT technology.
- CSIR-IICT has developed and patented a high rate biomethanation technology known as anaerobic gas lift reactor (AGR) for the generation of biogas and bio manure from organic solid waste like poultry litter, food waste, press mud, cattle manure, organic fraction of municipal solid waste (OFMSW), sewage sludge etc. This has been implemented in more than 20 places across the country including the Bowenpally Vegetable market in Hyderabad
- CSIR-NEERI has developed the RENEU Technology for the construction of wetlands that are sustainable wastewater treatment processes. RENEU was successfully implemented at Jhunsi, Prayag Raj, in readiness for the Kumbh Mela of 2019, being part of the National Mission to keep the Ganges clean for the pilgrims during the holy festival.
- The CSIR has conducted whole genome sequencing of 1,008 Indians from different populations across the country. The whole genome data is important for building the knowhow, baseline data and indigenous capacity in the emerging area of Precision Medicine. This genome sequencing has enabled benchmarking the scalability of genome sequencing and computational analysis at population scale in a defined timeline.
- Technology for 27 Diagnostic tests for genetic diseases was transferred to Lal Path Labs by CSIR-IGIB.
- CSIR-IICT has signed a global licensing pact with Sun Pharma for patents on dermatology, ophthalmology and oncology. Sun Pharma will pay upfront and milestone linked payments upto Rs 240 crore and royalties to CSIR-IICT from commercialization.
- CSIR-CLRI has developed a zero-wastewater discharge technology based on Electro-oxidation (EO) in the pre-tanning phase of the leather manufacturing process.
- CSIR-NAL has developed and transferred the technology of Drishti Transmissometer that have been deployed in many airports in India. The transmissometer is a visibility measuring system, useful for safe airport operations and landing. Drishti been installed at several airports in the country and recently the 50th Drishti was installed at the runway of Kempegowda International

Airport (KIA). The Bengaluru Airport also installed the indigenous Aviation Weather Monitoring System (AWMS) at its new runway.

- A transfer agreement for the manufacturing of a new variant of Head-Up Display (HUD) for the Tejas Fighter Aircraft for commercial production has been signed between CSIR-CSIO, Chandigarh and Bharat Electronics Limited (BEL).
- Bharatiya Nirdeshak Dravya (BND 420) is India's first home grown high purity gold reference standard developed through a collaboration among the India Government Mint (IGM), Bhabha Atomic Research Centre (BARC), CSIR-NPL and National Centre for Compositional Characterisation of Materials.
- CSIR-CMERI has developed three Mob Control Vehicles (MCV). The first MCV is built on a tractor, fitted with hydraulically operated retractable shields and suitable for Police and BSF. The other developed MCVs are Heavy Category (Stallion chassis) MCV 7.5T payload and Medium Category (LPTA chassis) MCV 2.5T payload with several add on features like Front shovel; Front shield; Water canon; Form spray system; Multi-Barrel Launchers (Mechanized shell loading) etc. Mock trials and Inspection of Heavy Category (Stallion chassis) MCV 7.5T payload and Tractor based MCVs has been carried out by CRPF-RAF team.
- CSIR-CIMFR has discovered shale gas in two areas in the Gondwana basin in Central India and Godavari basin. The total shale gas discovered so far in the country in these two basins is estimated to be about 63 Trillion Cubic Feet (TCF). It is considered as one of the best sources of non-conventional natural gas.
- A reading device developed by CSIR-CSIO helps the visually impaired by reading the text aloud. The advanced reading machine named "Divya Nayan" is a stand-alone, Portable Reading Machine (PRM). The technology has been transferred to CEL Central Electronics Limited (CEL)
- CSIR-NCL has set-up an indigenous process technology to create Dimethyl Ether (DME) from methanol. DME is a clean fuel with potential to replace diesel and will be a non-fossil additive to LPG gas. This will also help the Prime Minister Ujjwala Yojana program, by reducing LPG imports.
- A first of its kind earthquake warning system has been developed by CSIR-CSIO. The system can sense tremors, record them and generate an SMS to the concerned action points, in real time. It has been deployed and is operational at Delhi Metro since July 2015.
- A plant based on Wax Deoiling Technology developed by CSIR-IIP set up at Numaligarh Refinery, BPCL was dedicated to the Nation by Prime Minister, Shri Narendra Modi. It will produce 50,000 MMTPA of high value Paraffin Wax and 4,500 MTPA of Microcrystalline Wax at the full capacity. This will help cut down the wax import by 50% & save the foreign exchange of about Rs 500 crore/year.
- The first indigenously built research vessel 'Sindhu Sadhana' was dedicated to the nation in 2014 by Shri Jitendra Singh, the Union Minister of State for Science and Technology. The multi-disciplinary research vessel of CSIR-NIO is 80 meters long and 17.6 m wide and can accommodate 57 personnel including 29 scientists and 28 crew members. It is designed for a cruising speed of 13.5 knots and an endurance of 45 days. The research vessel has 10

laboratories which are fitted with state-of-the-art equipment facilitating high precision data and sample acquisition.

- CSIR-NEERI developed Green Crackers in a bid to curb air pollution. Green logo and QR coding system was also launched to track manufacture & sale of counterfeit crackers.
- For the first time, CSIR-IHBT introduced asafoetida (Heeng) cultivation in the Indian Himalayan region. Since asafoetida is a major condiment in Indian cuisines, CSIR-IHBT made relentless efforts for introduction of this important crop in the country.
- Hon'ble PM, Shri Narendra Modi dedicated National Atomic Timescale and Bhartiya Nirdeshak Dravya Pranali to the Nation and laid the Foundation Stone of National Environmental Standards Laboratory on the occasion of 75 years of CSIR-NPL.
- CSIR-CSMCRI has developed a technology for recovery valuable potash from spent wash generated in sugarcane molasses-based alcohol distillery and saves foreign exchanges and prevents hazardous spent wash being discarded was appreciated by Hon'ble PM, Shri Narendra Modi.
- Kisan Sabha App has been developed by CSIR-CRRI to connect farmers to the supply chain and freight transportation management system. This portal acts as a one-stop solution for farmers, transporters, and other entities engaged in the agriculture Industry. More than one lakh downloads and also available in regional languages.
- CSIR has developed a low-cost and portable Ksheer Scanner, a technology to detect adulterated milk.
- CSIR's NIMTLI Program has catalysed the development of indigenous dental implants. It was developed by IIT Delhi, Maulana Azad Institute of Dental Sciences (MAIDS). This medical device was conceptualized, designed and manufactured at IIT Delhi in collaboration with Maulana Azad Institute of Dental Sciences (MAIDS). This was appreciated by Hon'ble PM with a letter of appreciation.
- CSIR-CCMB in collaboration with the Indian Institute of Rice Research at Hyderabad has released a new variety of rice that resists pests and is also beneficial for those with diabetes. The new Improved Samba Masuri (ISM) rice variety is resistant to Bacterial Blight (BB) and at the same time has the lowest Glycemic Index (GI) at 50.9 among all major rice varieties.
- The new upgraded version of SARAS PT1N, a 14-seater passenger aircraft developed by the CSIR-NAL completed a successful maiden flight on 24th January 2018.
- "JIGYASA" is one of the major initiatives taken up by CSIR at national level to widen and deepen CSIR's Scientific Social Responsibility (SSR) by connecting school students to scientists at CSIR. CSIR has signed MoU with Kendriya Vidyalaya Sangathan (KVS), Jawahar Navodaya Vidyalaya. More than 3,00,000 students have benefitted from the programme. Recently, CSIR has engaged with Atal Tinkering Labs of Niti Aayog and aims
- to adopt 295 Atal Tinkering Labs established by Atal Innovation Mission nationwide to spur STEM based research and innovation interest in students leveraging its scientists and labs.
- SARS-CoV2 pandemic and CSIR's contributions towards mitigation:
 - CRISPR/ Cas based paper diagnostic test (FELUDA)

- Dry-Swab-Direct-RTPCR Diagnostic
 - Clinical Trials of Ayurveda based drugs
 - Swasth Vayu Non-invasive Ventilator
 - Oxygen Plants
 - Make-Shift Hospitals for Covid-19 patients
 - UV-C Virus Disinfection System that has been installed in places such as Central Hall of Parliament, Buses, railway coaches
 - Air surveillance for SARS-CoV2 in hospitals and home settings
 - Octacopter drones for Vaccine delivery
- CSIR Aroma Mission and Floriculture Mission (Apiculture): To bring about a radical change among the farming community and enhance farmers' income, CSIR's Aroma and Floriculture Missions brought 14,500 27,500 hectares under cultivation of aromatic crops. CSIR has also developed entrepreneurship (110) through technologies that promote cultivation and processing of aromatic crops, value-added aromatic crops for high-end aroma chemicals and products. For the first time ever, Asafoetida (Heeng) cultivation has been introduced in India and Saffron cultivation has been widened. CSIR enabled the famed Purple Revolution by introducing Lavender Cultivation in 10 districts of J&K benefitting more than 1000 farming families. India from being one of the importers of Lemongrass essential oil a few years back, now becomes one of the largest exporters in the world. Indigenous development of Tulip bulb production in Lahaul & Spiti under the Floriculture mission helped reduce the import of planting material.
 - Gaon Ka Pani Gaon Mein: CSIR has led a Mission mode project for developing Village Level Water Management (VLWM) Plans for augmenting water resources in selected villages. Mission on High-Resolution Aquifer Mapping & Management in Arid Regions of North-Western India has also been launched and implemented in association with the Ministry of Jal Shakti under Jal Jeevan Mission. Use of advanced Heliborne geophysical survey and other scientific studies have been initiated under the Aquifer Mapping Programme of the Mission. So far, 1 lakh Sq. Km Heliborne geophysical survey data has been collected in the states of Rajasthan, Haryana and Gujarat. This survey led into identification of water source at Munjasar, Lohawat Block, Jodhpur District, Rajasthan.
 - Technological innovation Energy Storage devices: Under CSIR's Innovation Centre for Next Generation Energy Storage Solutions (ICeNGESS) project, CSIR-CECRI's knowhow on Lithium-Ion Battery Technology was transferred to M/s. Tata Chemicals Ltd., Mumbai. The major objective of the project has been to develop next generation energy storage solutions with 100 MW Li-ion battery production facility creation and augmentation of existing facility to 1000 cells per day, the project also aimed for IPR & Technology development, scale up & production of battery materials, supply chain creation & indigenisation, sustainability of Lithium from Coal and to develop Public Private Partnership (PPP).
 - Launch of India's first indigenously developed hydrogen fuel cell bus: India's first indigenously developed bus to run on hydrogen fuel cell been designed and developed by CSIR-NCL and CSIR-CECRI in collaboration with Sentient Labs. The 32-seater bus, equipped with central air conditioning facility, is designed to provide a range of 450 kilometre by utilising 30 kg of

Hydrogen. The bus uses hydrogen fuel cells and air to generate electricity for power and can run for 600 km without stopping. The only emission from the bus is water, thus, making it the most environment friendly mode of transportation. The 'Made in India' hydrogen fuel cell bus was launched on December 15, 2021, in Pune.

- Cabinet approved widening access of the TKDL database to users, besides patent offices: The Cabinet chaired by Hon'ble Prime Minister, Shri Narendra Modi approved the Widening access of the Traditional Knowledge Digital Library (TKDL) database to users, besides patent offices on 17 August 2022. The opening up of the TKDL database to users will drive research & development, and innovation based on India's valued heritage across diverse fields.
- Earthquake & natural disasters—developed technology for reducing property loss: CSIR-CBRI and CSIR-SERC have been designing structures that can withstand earthquakes, and due emphasis and importance are being given to incorporate this aspect in all designs.
- CSIR focuses 'Waste to Wealth' technologies to supplement the efforts of Swachta Abhiyan: CSIR has developed many waste to wealth technologies and products such as spent wash from distillery, industrial solid waste, brine sludge, e-waste, coal-based power industry waste, biomass/agri waste, fertilizer industry waste, lime sludge, marble waste, etc. and these technologies are at various stages of implementation with MSMEs, industries and other partners.
- Steel Slag Road: Steel Slag Valorisation Technology for Conversion of Steel Slag as Road Making Aggregates: CSIR developed the steel slag valorization technology to convert waste steel slag as road making aggregates. Processed steel slag aggregates as developed through waste steel slag has been successfully utilized in the construction of India's First Steel Slag Road at Hazira, Surat. Around one lakh ton processed steel slag aggregates were utilized as 100% substitute of natural aggregate in steel slag road construction. For its unique design features Steel Slag Road built through CRRI technology has been inducted in INDIA BOOK of Records and ASIA BOOK OF RECORDS as First Steel Slag Road. Border Roads Organisation (BRO) using the CSIR-CRRI technology has laid a one km road in border area of Arunachal Pradesh.
- Design and development of CSIR - TechnoS Raman Spectrometers (CTR Series): CSIR developed and commercialized Raman spectrometers in a Public-Private Partnership, in a collaboration of CSIR-AMPRI, Bhopal and M/S TechnoS Instruments, Jaipur. Two models of high-end commercial grade Raman Spectrometers, CTR-300 and CTR-150 have been developed and approved for marketing by the industry partner, M/S TechnoS Instruments in January 2022.
- Maiden flight of HANSA NG: CSIR-NAL designed and developed Hansa NG aircraft which is an all composite two seat light trainer aircraft to be used as an ab-initio flying training aircraft for the flying clubs in India, with significant modifications on Hansa 3 aircraft to make it more useful as a trainer aircraft. The newly developed Hansa 3 (NG) made its maiden flight on 3rd September 2021 after obtaining special flight permit by DGCA. The 20-minute sortie saw the first prototype of the Hansa 3 (NG) attain a maximum altitude of 4,000 feet and a speed of 80 knots before it made a successful touch down. Further, the aircraft has successfully completed the sea level trials at Puducherry between February 19 and March 5. The aircraft was flown to

Puducherry, covering 140 nautical miles in one and half hours at a cruising speed of 155 km/hr, on 19 February 2022.

- **Development of Indian National Footwear Sizing System:** CSIR-CLRI conducted a nationwide survey on foot dimensions of the Indian population using 3D Digital Imaging technique to establish the Indian Footwear Sizing System. Thirty numbers of 3D Foot Scanners ordered and installed during the last week of September 2021. Synergy Partners were identified, and MoU signed with Central Footwear Training Institute (CFTI), Chennai, CFTI Agra, Government College of Engineering and Leather Technology (GCELT), Kolkata and Muzaffarpur Institute of Technology (MIT), Muzaffarpur. Demographic locations (79 districts) finalized based on the recommendations of National Sample Survey Organization (NSSO). Hands on Training for 90 field staff on 3D foot scanner started on 5th October 2021. A total of 1,01,880 foot measurements have been carried out by the end of March 2022. The Indian National Footwear Sizing System that is being developed will help the populace to get well fitting shoes that adhere to the contours of their feet thus ensuring perfect fit and comfort and also prevent foot debilitations.
- **3D-Printed Patient-Specific Medical Implants developed:** CSIR-CSIO developed a technology for manufacturing patient-specific medical implants for several human body parts. The technology has been transferred to industry for commercial production and marketing of the product. Patient-specific implants are required in trauma, diseases like cancer, fungal infection or other reconstructive surgeries for specifically targeted patients.
- **Connect global Indian Scientific Community on Digital mode:** CSIR has developed a virtual platform - PRABHASS (Pravasi Bharatiya Academic and Scientific Sampark) Portal to connect with the global Indian S&T Diaspora for jointly addressing societal challenges/problems. Database of over 6000 Diasporas from 47 countries are available.
- **CSIR 'Skill India Initiative':** CSIR's Skill India Initiative aims to equip young minds with the necessary technological skills through exposure to CSIR labs. More than 2 lakh people have been trained under the initiative.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1886797>

THE ECONOMIC TIMES

Mon, 26 Dec 2022

Chennai-based Start-up Aims Big after UAE Space Agency Deal

Aerospace and defence parts start-up ST Advanced Composites which supplied the necessary structural components for the manufacture of satellites for a UAE-based space agency aims to tap the market potential in this sector, a top official has said. The city-based company bagged the order from the space agency in 2020 to supply parts that go into the manufacturing of the satellite to study the soil and carry out water analysis on the Moon, director Devendran Thirunavukarasu said. "The UAE-based space agency offered us one contract in December 2020 and it was completed successfully in four-five months. After that there was a regular meeting and they gave the second order also which is manufacturing satellites. We commenced working in

April 2022 and it was successfully launched on December 11 through the SpaceX launch," he told PTI in an interaction. Scientists have commenced communication with the system as the target has been achieved. "They will be able to do soil tests and water analysis there (on the Moon)," he said. Elaborating, he said the company supplied structural components in the making of payload, satellite casing of the rocket. "The purpose is that it should be light weight as weight plays a major role in the space sector. if you take metals, the density will be higher but with carbon fibre we can reduce it by up to 60 per cent," he said.

Thirunavukarasu, hailing from a farmers' family is an aeronautical engineer who later pursued his post-graduation in France, said, "I got an opportunity to work in Rome for aircraft manufacturing. After that I shifted back to Chennai and started the company in 2014."

The company, he said, uses carbon fibre as the basic raw material to manufacture the products allowing them to substantially reduce the weight of satellites which constitute the majority of the payload weight on a rocket. "When we supplied our parts to the UAE-based space agency they liked it. What we delivered to them was very light in weight...We are basically a light-weight manufacturer and solution provider for aerospace and defence," he added. The majority of the technology used is 'carbon-fibre technology', he said. To a query, he said the company was engaged with various government projects with Muscat, Oman, the United Kingdom and Israel. "Our target is to do more exports under the Centre's Make in India campaign and become a pioneer in the aerospace and defence sector," he said.

On the outlook, he said the company was currently engaged in discussions to set up its manufacturing facility at Vallam Vadagal in neighbouring Sriperumbudur district. "We have identified one acre land from TIDCO (Tamil Nadu Industrial Development Corporation Ltd) and currently discussions are on. We expect to shift there at the Chennai Aerospace Park by January or February," he said. Responding to a query, he said the company was started with a capital of less than Rs 1 lakh in 2014 and was currently in discussion with various government agencies in the country to supply parts. "Right now we cannot reveal details of the project. We are already serving the Indian Space Research Organisation and Defence Research and Development Organisation (DRDO)," he said.

The company after setting up a base in Chennai has plans to set up offices in Bengaluru and also in New Delhi. "Right now we are about 20 people. We are planning to add another 20 people, when we set up the manufacturing facility at Vallam Vadagal," he said.

<https://economictimes.indiatimes.com/news/india/chennai-based-start-up-aims-big-after-uae-space-agency-deal/articleshow/96510622.cms>

नवभारत टाइम्स

Tue, 27 Dec 2022

India Population in 2023: क्या आबादी के हथियार से चीन को पीछे छोड़ पाएगा भारत?

अगले साल भारत दुनिया में सबसे ज्यादा आबादी वाला देश बन जाएगा। संयुक्त राष्ट्र का अनुमान है कि साल 2023 में 14 अप्रैल को भारत जनसंख्या के मामले में चीन को पीछे छोड़

देगा। यूएन के मुताबिक, 15 अप्रैल को भारत की आबादी एक अरब 42 करोड़ 57 लाख 75 हजार 850 होने का अनुमान है। सवाल यह है कि क्या इतनी विशाल आबादी फायदे की बात है? फायदा है और ऐसा भारत की एक खासियत की वजह से है। यह खासियत है नौजवानों और कामकाज करने लायक लोगों की बड़ी तादाद। चीन इस मामले में भारत से पिछड़ रहा है। यह डेमोग्राफिक डिविडेंड भारत के लिए वरदान जैसा है। लेकिन इसका फायदा उठाने के लिए भारत के पास बहुत कम समय बचा है।

जब आबादी में कामकाज करने लायक लोगों की संख्या बच्चों और बूढ़ों से ज्यादा हो जाती है और इसके चलते तेज आर्थिक तरक्की की संभावना बनती है तो इसे डेमोग्राफिक डिविडेंड कहा जाता है। मोटे तौर पर 15 से 64 साल की उम्र ऐसी होती है, जब लोग कामकाज के लिए फिट होते हैं।

अनुमान है कि अब से लेकर साल 2050 के बीच दुनिया में कामकाजी उम्र वाले लोगों की जितनी संख्या बढ़ेगी, उसमें हर छठा आदमी भारत का होगा। भारत में मीडियन एज 29 है। यानी हमारी आबादी का लगभग आधा हिस्सा 29 साल से कम उम्र का है। यूनाइटेड नेशंस पॉपुलेशन फंड (UNFPA) के मुताबिक, भारत में 68 प्रतिशत लोग 15 से 64 साल तक की उम्र के हैं।

यूनाइटेड नेशंस का अनुमान है कि भारत में 27 प्रतिशत लोगों की उम्र 15 से 29 साल के बीच है। 10 साल के बच्चों से लेकर 19 साल तक के किशोरों की तादाद भारत में 25 करोड़ से अधिक है। इस आयु वर्ग के इतने लोग दुनिया में किसी भी दूसरे देश में नहीं हैं। दूसरी ओर, चीन बूढ़ा होने की राह पर है। अभी चीन की मीडियन एज 39 साल है। साल 2050 तक उसकी मीडियन एज 51 हो जाएगी। युवा आबादी के दम पर तरक्की करने वाले अधिकतर देश अब बुढ़ाने की राह पर हैं। ब्राजील और ब्रिटेन से लेकर अमेरिका और जापान जैसे देशों में मीडियन एज 34 साल से 49 साल तक की है।

UNFPA का अनुमान है कि अगले करीब 15 वर्षों तक भारत में नौजवानों की तादाद बढ़ती रहेगी। उसके बाद इसमें गिरावट आने लगेगी। सरकारी रिपोर्ट 'यूथ इन इंडिया' के अनुसार, देश में युवाओं की यानी 15 से 30 साल तक के लोगों की संख्या साल 2026 में लगभग 37 करोड़ और साल 2036 में 35 करोड़ के आसपास होगी।

भारत हाल में ब्रिटेन को पीछे छोड़कर दुनिया की पांचवीं बड़ी अर्थव्यवस्था बना था। स्टेट बैंक ऑफ इंडिया की एक रिपोर्ट के अनुसार, साल 2029 तक भारत दुनिया की तीसरी बड़ी इकॉनमी बन सकता है। चीन की इकॉनमी अभी भारत से करीब छह गुनी बड़ी है, लेकिन चीन में

कामकाजी उम्र वाले लोगों की संख्या घटने सहित कई दिक्कतें उभर रही हैं। ऐसे में आने वाले दशकों में अपने नौजवानों के दम पर भारत उसे पीछे छोड़ सकता है।

लेकिन ऐसा तभी हो पाएगा, जब बच्चों को सस्ती और अच्छी पढ़ाई की सुविधा मिले। तभी उन्हें कामकाज के लिए तैयार नौजवान के रूप में तराशा जा सकेगा। भारत को इन पढ़े-लिखे नौजवानों के लिए रोजगार के पर्याप्त अवसर भी बनाने होंगे।

लेकिन अभी भारत में आधे से कम ही वयस्क लोग लेबर फोर्स में हैं। चीन बूढ़ा होने की राह पर है, लेकिन फिलहाल वहां दो तिहाई वयस्क आबादी लेबर फोर्स में शामिल है। भारत में लेबर फोर्स पार्टिसिपेशन रेट (LFPR) लगभग 45 प्रतिशत है। चीन में आंकड़ा 68 प्रतिशत का है। यहां तक कि वियतनाम में यह रेट 74 प्रतिशत और मलेशिया में 65 प्रतिशत है। भारत में लेबर फोर्स पार्टिसिपेशन कम होने की एक बड़ी वजह यह है कि इसमें महिलाओं की भागीदारी बहुत कम है।

एक बड़ा मसला एजुकेशन और स्किल का भी है। यूनिसेफ की एक रिपोर्ट में अनुमान जताया गया है कि साल 2030 तक भारत में 47 प्रतिशत ऐसे नौजवान होंगे, जिनके पास रोजगार पाने लायक एजुकेशन और स्किल नहीं होगी। टाइम्स हायर एजुकेशन वर्ल्ड एजुकेशन रैंकिंग के ताजा आंकड़ों के मुताबिक, दुनिया के टॉप 200 संस्थानों में भारत के कुल 7 संस्थान ही हैं।

सरकारी संस्थानों की नाकामी संख्या के बीच शिक्षा कितनी महंगी होती जा रही है, इसे मेडिकल की पढ़ाई पर आने वाले खर्च से समझा जा सकता है। सरकारी मेडिकल कॉलेजों में 5 साल के एमबीबीएस कोर्स की फीस आमतौर पर एक लाख रुपये के आसपास होती है, लेकिन मुश्किल यह है कि इन कॉलेजों में सीटें 40 हजार के आसपास ही हैं। प्राइवेट कॉलेज और डीम्ड यूनिवर्सिटी में सालाना फीस 18 से 30 लाख रुपये तक की है।

सरकार का फोकस डिजिटल एजुकेशन, जॉब क्रिएशन, एग्रीकल्चर यूनिवर्सिटी, स्किल डिवेलपमेंट प्रोग्राम जैसे क्षेत्रों पर है। लेकिन शिक्षा के लिए ओवरऑल बजट की बात आती है तो मामला फीका लगने लगता है। मौजूदा वित्त वर्ष में सरकार ने एजुकेशन के लिए एक लाख 4 हजार 278 करोड़ रुपये आवंटित किए थे। पिछले वित्त वर्ष के मुकाबले यह करीब 12 प्रतिशत अधिक था। लेकिन पेच यह है कि पिछले वित्त वर्ष में एजुकेशन बजट 6 प्रतिशत घटा दिया गया था। उस घटे लेवल से 12 प्रतिशत का इजाफा किया गया। इस तरह कुल इजाफा महज 11 हजार करोड़ रुपये के आसपास रहा। शिक्षा की बात आती है तो कहा जाता है कि एजुकेशन पर सरकारी खर्च जीडीपी के कम से कम 6 प्रतिशत पर होना चाहिए। लेकिन आज तक कभी ऐसा नहीं हो पाया है। मौजूदा वित्त वर्ष में भी एजुकेशन जीडीपी के लगभग 3 प्रतिशत पर ही रहा। अगर शिक्षा पर सरकारी खर्च जीडीपी के 6 प्रतिशत पर ले जाना होता तो मौजूदा फाइनेंशियल ईयर में एजुकेशन बजट सवा दो लाख करोड़ रुपये के आसपास होना चाहिए था।

नए साल में भारत आबादी के मामले में एक अहम पड़ाव पर पहुंचेगा। बड़ा सवाल यह है कि नए साल में भारत क्या अपने बच्चों और नौजवानों को पढ़ाने-लिखाने और उन्हें रोजगार के मौके देने के लिए जरूरी इंतजाम करेगा? यूनाइटेड नेशंस पॉपुलेशन फंड (UNFPA) की एक रिपोर्ट के अनुसार, भारत में अभी करीब 68 प्रतिशत आबादी 15 से 64 साल की उम्र के दायरे में है। लेकिन भारत डेमोग्राफिक डिविडेंड वाली राह पर साल 2055-56 तक ही रहेगा। यानी इस वरदान का फायदा उठाने के लिए अब मुश्किल से तीन दशक बचे हैं।

वित्त मंत्री निर्मला सीतारमण ने पिछले दिनों एक अहम बात कही। उन्होंने कहा कि आगामी बजट ऐसा होगा, जिससे अगले 25 वर्षों के लिए तरक्की का आधार बनेगा। सवाल यह है कि क्या उसमें एजुकेशन और स्किल डिवेलपेंट पर जरूरी फोकस भी होगा? क्या उसमें हर साल वर्कफोर्स में जुड़ने वाले दो करोड़ से ज्यादा हाथों को रोजगार देने का इंतजाम होगा? फेक न्यूज के दौर में ये असली और जरूरी सवाल हैं।

<https://navbharattimes.indiatimes.com/navbharatgold/day-today/india-will-become-the-worlds-most-populous-country-in-april-2023/story/96517248.cms>

