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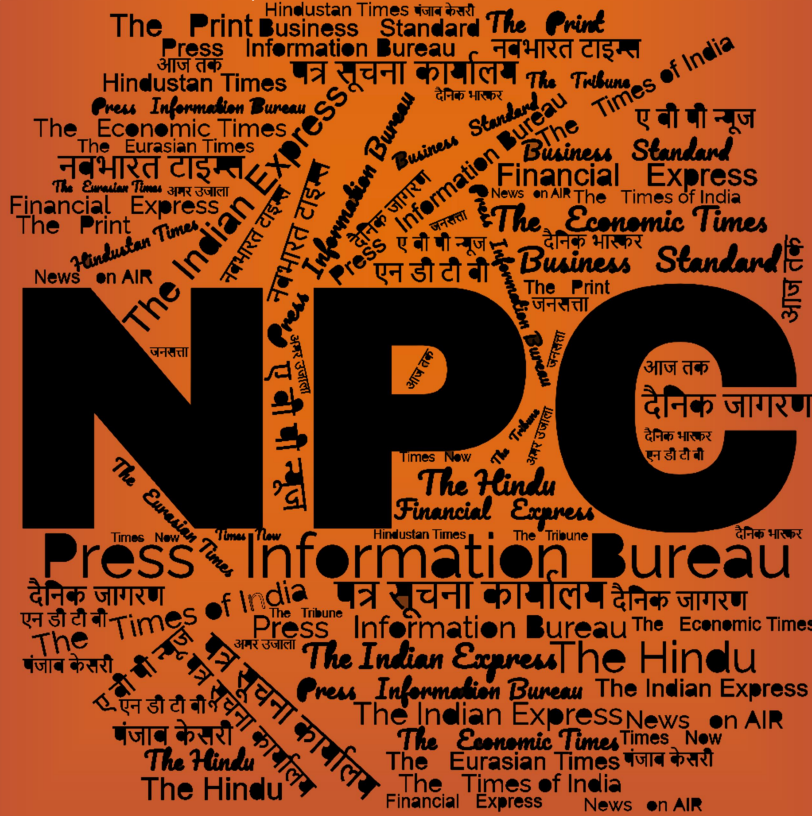
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DRDO News

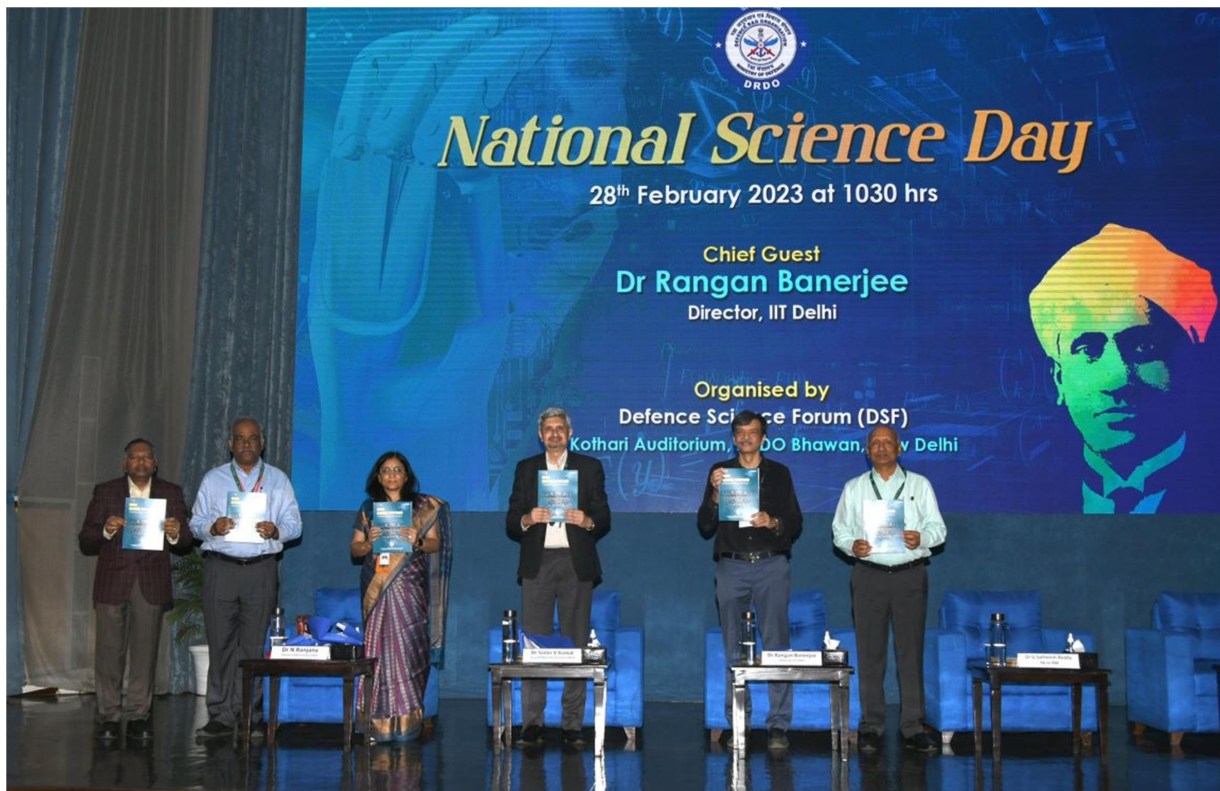
DRDO Technology News

TheSamikhsya

Tue, 28 Feb 2023

National Science Day 2023: DRDO Celebrates

Defence Research & Development Organisation (DRDO) celebrated National Science Day 2023 through lectures, orations and open house activities in its laboratories and establishments on February 28, 2023. A special function was organised by Defence Science Forum at DRDO Bhawan in New Delhi.



Secretary Department of Defence R&D and Chairman DRDO Dr Samir V Kamat presided over the function. Director, Indian Institute of Technology (IIT), Delhi Prof Rangan Banerjee was the Chief Guest, with Scientific Advisor to Raksha Mantri Dr G Satheesh Reddy also in attendance.

The theme of this year's National Science Day was 'Global Science for Global Well-being'. The DRDO Chairman greeted the scientific community on the occasion and spoke about the

importance of commitment towards science for delivering quality products/technology to the services. Addressing the gathering, Scientific Advisor to Raksha Mantri stated that scientific research is very essential to develop first-of-its-kind products. He stressed that focus should be on basic science so that newer state-of-art technologies and systems can be developed.

Director, IIT, Delhi delivered a lecture on ‘International Collaborations in Science and Engineering – A View from IIT Delhi’, wherein, he brought out the importance of global collaboration in field of scientific research for finding solutions to the global well-being.

He emphasised on the need to identify synergies and create an enabling ecosystem for translation of ideas. He highlighted the successful joint research programme of DRDO and IIT Delhi which has led to the successful research endeavours. He highlighted that DRDO should act as a catalyst and thought leader and facilitator in key strategic areas of research.

A total of 39 oration papers were received from various DRDO labs/establishments, out of which three papers selected for presentation at the event as DRDO Science Day Orations. Shri Hari Singh, Sc ‘F’ from Hyderabad. Shri Laxman Mawani, Sc ‘E’, from Bangaluru and Shri Kumar Vyonkesh Mani, Sc ‘E’ from Delhi delivered the presentations on their respective areas of work in the area of defence research.

Dr Banerjee awarded the orators with a medal and certificate for their presentation. DRDO Science Spectrum, the compilation of all the scientific papers received (for National Science Day 2023), from various DRDO labs/estts was released on the occasion.

National Science Day is celebrated on 28th February every year to commemorate the discovery of ‘Raman Effect’ in 1928 by Sir Chandrasekhara Venkata Raman, which led to the Nobel Prize being awarded to him in 1930. The purpose of celebrating this day is to enhance scientific temper, popularisation of science and encouraging innovative activities by infusing scientific temperament in the masses and creating a positive scientific research culture.

Defence Science Forum (DSF) is a platform of DRDO where scientists of various disciplines interact to foster fellowship, exchange of ideas with luminaries of different disciplines and feasibility and planning of all inter-disciplinary projects where expert opinion is required.

<https://thesamikhnya.com/sci-tech/national-science-day-2023-drdo-celebrates>

NE India Broadcast
Leading The Way

Tue, 28 Feb 2023

National Science Day (NSD) was Celebrated in Defence Research Laboratory (DRL), Tezpur

National Science Day (NSD) was celebrated in Defence Research Laboratory (DRL), Tezpur to commemorate the discovery of Raman Effect on February 28 by the great Indian Physicist, Bharat Ratna, Chandrashekhara Venkata Raman, for his ground-breaking research work on scattering of light. He was also awarded the most prestigious Nobel Prize in physics in the year 1930 for Raman Effect.

DRL Tezpur, the only DRDO laboratory in NE region, celebrated NSD 2023 with great enthusiasm. Deputy Commissioner of Sonitpur district, Deba Kumar Mishra graced the occasion as the chief guest. The programme started with the address of the Director, DRL, Dr Dev Vrat Kamboj, who described the significance of the day to participating students from Jawahar Navodaya Vidyalaya Udalguri and Kendriya Vidyalaya-I Tezpur. He emphasized on the power of science and called upon the scientific fraternity to come together for the greater cause of science.



In the NSD programme an oration on a popular science topic was delivered by Prof Pradip Kumar Bora, Director NERIWALM, Tezpur. He stressed upon the importance of science in our day to day life and encouraged the students to take up science with enthusiasm to proceed with a child-like curiosity which is the essence of science.

The programme culminated with a very inspiring and thought-provoking speech by the chief guest Deba Kumar Mishra. He encouraged the students to be inquisitive, to seek scientific answers to problems encountered in every day life and to keep abreast with current affairs through the use of newspapers and traditional learning methods. He also informed the august gathering about the scheme AROHAN of Assam Govt. which aim to encourage meritorious students to nurture their scientific thinking.

<https://neindiabroadcast.com/2023/02/28/national-science-day-nsd-was-celebrated-in-in-defence-research-laboratory-drl-tezpur/>

Visakhapatnam: Aerospace Medicine Plays a Vital Role in the Training and Selection of Pilots and Air Crew, Says Enc Command Medical Officer



NSTL Director Y. Sreenivas Rao, Surgeon Rear Admiral R. Ravi, V. Seshu Bai, Professor Emeritus, University of Hyderabad, paying tributes to Sir CV Raman, on the occasion of National Science Day, in Visakhapatnam on Tuesday. | Photo Credit: BY ARRANGEMENT

Aerospace medicine, a multidisciplinary subject, plays a vital role in the training and selection of pilots and air crew apart from aviation psychology, clinical aviation medicine for both military and civil pilots and passengers, Surgeon Rear Admiral R. Ravi. Command Medical Officer, Eastern Naval Command (ENC) has said.

NSTL Director Y Sreenivas Rao, V Seshu Bai, Professor Emeritus, School of Physics, Central University of Hyderabad, and Surgeon Rear Admiral Ravi, offered floral tributes to Sir CV Raman on the occasion of National Science Day Celebrations (NSDC) – 2023, at the NSTL here on Tuesday.

The audience, including scientists and students listened in rapt attention as Surgeon Rear Admiral Ravi gave a presentation on ‘Aerospace medicine’ The videos of the first flight, fighter pilots losing consciousness while doing manoeuvres at high altitudes, high altitude training, spatial disorientation of pilots and information on some of the civilian flight disasters, which were caused due to disturbances in circadian rhythm, of the pilot, caught the attention of the gathering.

Dr. V. Seshu Bai delivered a talk on “Design of Composite Materials for Technology”.

Earlier, T.V.S.L. Satyavani, Scientist ‘F’ and chairperson of NSDC-2023, in her welcome address, explained how Raman effect was being used as a powerful characterisation tool in many applications.

P Sumanth, Scientist ‘D’ was awarded the ‘Silicon medal’ and Commendation Certificate signed by Chairman DRDO for his work on: “Validation of Degaussing System Design Process using a Physical Mock up Model”.

Transfer of Technology (TOT) of “Mk-II 200 AH Lithium Ion Battery Technology” was handed over to GSN Murthy, GM of BEL, Pune.

Students of Mrs. Mariadas UP School presented their invention on: “Wireless charging of electric vehicles using Wireless Power Transfer”. This project was selected from Andhra Pradesh along with the other seven projects, which were selected for the next round among 4,000 nominations received all over India for the McMillan Budding Scientist Award 2022-23.

A presentation on “Li-Ion Batteries” by Atal Kandhari, Senior Technical Assistant ‘B’ was also organised on the occasion.

As part of NSDC-2023, NSTL conducted elocution, essay writing, quiz and painting competitions for 300 students of 25 schools and 15 colleges. The celebrations concluded with the distribution of prizes to the winners of these competitions. Senior Scientists P.V.S. Ganesh Kumar and B.V.S.S. Krishna Kumar were among those who participated in the programme.

<https://www.thehindu.com/news/cities/Visakhapatnam/visakhapatnam-aerospace-medicine-plays-a-vital-role-in-the-training-and-selection-of-pilots-and-air-crew-says-enc-command-medical-officer/article66563835.ece>

United News of India
India's Multi Lingual News Agency

Tue, 28 Feb 2023

India Achieved Remarkable Success in the Field of Satellites, Missiles- Das

India has reached such a stage in which 126 nations of the world are now deciding the country as their destination, DRDO Director General (ECD) Bengaluru Dr Binay Kumar Das said on Tuesday.

Addressing the 14th convocation of VSSUT, Das said “There was a time in 1989, when USA restricted India not to make missiles beyond 300 km range.

The USA even threatened us to restrict import of apparatus used for missiles but Dr Abdul Kalam and the team took it as a challenge and we reached 5000 km with indigenous systems for missiles., he said.

We achieved remarkable success in the field of satellites and missiles,” said Dr Das to the students with an appeal to take every challenge as opportunity.

Dr Das further narrated the history of the success of the country in the fields of Science and Technology to that of Agriculture.

“If you can convert challenge to opportunity, then you can overcome every problem,” he said citing the example of Dhanush and Prachand indigenously designed by Indian scientists and DRDO in particular.

Dr Das who is an alumnus of the UCE Burla which is VSSUT now said he could have gone abroad and become a millionaire there too as there was such an opportunity for him.

The DRDO director said he decided to stay in India and serve the country and asked the young students to dedicate themselves to creating a ‘Great India’.

<http://www.uniindia.com/news/east/defence-das-satellites/2925120.html>



Tue, 28 Feb 2023

India’s Ballistic Missile Firepower Agni-V: Will it Cover China?

The Agni- V ballistic missile made India the fourth country after Russia, the United States and China to have both land and sea-based Inter-Continental Ballistic Missiles (ICBMs).

The Agni-V completes the concept of a Nuclear Triad. India’s nuclear forces include air-delivered free-fall weapons, land-based ballistic missiles, and a nuclear attack submarine (SSBN) capability. The potent arsenal in the triad is the submarine-launched K-4 missiles, leading into the Strategic Forces Command that takes care of India’s strategic assets. Primarily, the Agni 5 project was launched for India’s nuclear deterrence against China. The work on the Agni-V intercontinental ballistic missile project was started over a decade ago and the missile was tested seven times before.

India’s countermeasure is driven by China’s growing nuclear capability which was highlighted by then-Chief of Defence Staff, General Bipin Rawat. He called China the biggest security threat. Last year, India successfully test-fired the surface-to-surface strategic missile Agni-5 which can strike targets up to a range of 5,000 km. The key factor is the range. However, according to military experts, the range could go up to 5,500 Km.

Interestingly, Despite, the sufficient range, the Defence Research and Development Organization (DRDO) defines Agni-V as an intermediate-range ballistic missile (IRBM), rather than as an ICBM– intercontinental ballistic missile (ICBM).

With such capacity, the Agni-V can reach the northernmost parts of China with its strike range of over 5,000 km. With such range, the missile can hit any town in China, including its two largest cities—Beijing and Shanghai. On the other side, China has developed the ICBM with a similar range or beyond. Among its arsenal, the DF-41 has the highest range. How capable is DF-41 in comparison with Agni- V?

China's ICBM-DF-41

China has been developing the Dongfeng range of missiles-DF missile. The DF missiles are a series of ballistic missiles with the capability to engage targets at short, medium, intermediate, and intercontinental ranges. In the series, China's DF-41 stands out in terms of its range and capabilities.

The first test launch of DF-41 took place in 2013 and the second followed in 2014.

Like the Agni-V, the Chinese DF-41 is also loaded with a solid-fuel missile, providing accuracy over the long trajectory- target. It has an estimated range of 12 000 km and carries up to 10 Multiple Independently-targetable Re-entry Vehicles (MIRVs). While still in the testing phase, it is expected that the Dong Feng aims to surpass the speed of Mach 25.

The missile can carry multiple warheads, including up to ten nuclear warheads, with a total payload of 2,500kg. In comparison, the Agni-V missile can carry approximately 1500 kg in the payload and it can reach an exceptional Mach 24 speed which is 29,401 km/h.

With a range of 12,000 km, China can strike anywhere in India. In fact, China has a parallel development plan in the continental range which includes DF-31AG, DF-17 and DF-31AG.

However, in terms of fully operational capabilities, the Dong Feng 5 remains the longest-range missile in China with a range of 13,000 km. It can strike the United States and Western Europe.

<https://www.financialexpress.com/defence/indias-ballistic-missile-firepower-agni-v-will-it-cover-china/2995206/>

Defence News

Defence Strategic : National/International

Firstpost.

Tue, 28 Feb 2023

India Receives Third S-400 Squadron from Russia, will Hit Deeper inside China, Pakistan

India has received the third squadron of the S-400 air defence system from Russia. This S-400 squadron is being deployed at the border with Pakistan in order to tackle arial attacks on Punjab and northern Rajasthan. For India, which has to deal with two enemies on two fronts in the form of China and Pakistan, the delivery of the third S-400 squadron is an assurance against any attack from Pakistan.

According to the need or in the event of increasing tension from China, India can also shift its deployment from the western front to the eastern front. The first squadron of S-400 from Russia

came to India in December 2021 and the second squadron in April 2022. Despite being caught up in the war against Ukraine, Russia delivered the third squadron in February 2023.

Why is S-400 important for India?

The Indian Air Force (IAF) has deployed its first S-400 squadron near Pathankot, from where any air attack from China on Ladakh, Himachal and Uttarakhand can be stopped. The same squadron will also be used to counter air strikes from Pakistan on Jammu and Kashmir and Punjab. The second S-400 squadron has been deployed to protect the Siliguri Corridor in West Bengal. Indian Air Force (IAF) personnel have completed the S-400 training in Russia and are now ready to deploy the system.

China has many missiles of different distances, which it can use against India. Pakistan has also developed missiles as its main weapon with the cooperation of China. Due to the unstable political situation of Pakistan and the increasing influence of fundamentalists on the army, the apprehensions of using these missiles against India have increased.

China also uses the S-400 system for air defence. That's why India needed this system for its security. At the same time, India is in danger of air attack from both Pakistan and China, so it needs an air defence system which is accurate as well as of long range. Because by making its rocket force powerful, China has greatly increased the stock of missiles.

S-400 deal between India, Russia

India made a big defence deal with Russia in 2018 for Rs 35000 crore, under which five squadrons of S-400 were to be received from Russia by India. There are 16 vehicles in a squadron. An S-400 system can stop an attack from a variety of enemy weapons including drones and ballistic missiles in an area of 400 km.

How does the S-400 work?

The radar of the S-400 starts tracking the enemy's air attack from a distance of 500 km and destroys the enemy's missile when it comes into range. The Indian Air Force (IAF) uses the Israeli Spyder air defence system in addition to the indigenous Akash air defense system, MRSAM, a medium-range missile defense system developed in collaboration with Israel, to intercept air attacks. But with the arrival of the S-400, India's air defence has become almost impregnable.

<https://www.firstpost.com/world/india-receives-third-s-400-squadron-from-russia-will-hit-deeper-inside-china-pakistan-12220092.html>



Tue, 28 Feb 2023

IAF to Uphaul Interoperability with UK's Royal Air Force in Exercise Cobra Warrior 2023

The Indian Air Force (IAF) is set to participate in joint air exercise 'Cobra Warrior' with United Kingdom's Royal Air Force (RAF) in the coming days. The exercise is scheduled to be held at

the UK's Waddington Air Force Base from March 6 to March 24, 2023. The IAF dispatched a contingent comprising 145 Air Warriors from Air Force Station Jamnagar to participate in the multilateral Air Exercise on Sunday.

A multilateral air drill hosted by the RAF, Exercise Cobra Warrior incorporates participation from various countries, including the US, Canada, Germany, and Italy. Notably, in the latest edition of the exercise, Finland, Sweden, South Africa, the United States and Singapore are set to participate, the Indian Defence Ministry stated. Furthermore, the IAF's participation in the exercise will see the deployment of five Mirage 2000 fighters, two C-17 Globemaster III and an IL-78 midair refueller aircraft, as per a statement by the Defence Ministry.

Exercise to uphaul interoperability and operational readiness

Exercise Cobra Warrior is designed to provide a realistic and challenging training environment for the participating air forces to enhance their interoperability and operational readiness. The exercise involves complex air operations scenarios, including air-to-air combat, air-to-ground strikes, and other missions, which require extensive coordination and cooperation among the participating air forces. The significance of the IAF's participation in Exercise Cobra Warrior lies in the opportunity it provides the Force to train and operate with other air forces, exchange tactics, techniques, and procedures, and enhance its capabilities to operate in a multinational environment.

It also provides an opportunity for the IAF to showcase its capabilities and interoperability with other air forces to the international community. The exercise also promotes mutual understanding and cooperation between the participating air forces and helps in building stronger partnerships in the region. The Indian Air Force participated in the exercise for the first time in 2019 and again in 2021. Meanwhile, the Indian Air Force and the British Royal Air Force have a long history of joint exercises. Some of the major joint exercises between the two air forces include Exercise Indradhanush, Exercise Eastern Bridge, Exercise Red Flag, and Exercise Desert Eagle. These joint exercises provide an opportunity for the IAF and the RAF to learn from each other's experiences, and to enhance their operational capabilities through mutual training and cooperation.

<https://www.republicworld.com/india-news/general-news/iaf-to-uphaul-interoperability-with-uks-royal-air-force-in-exercise-cobra-warrior-2023-articleshow.html>

Business Standard

Tue, 28 Feb 2023

Indian Army Testing Armed Drone Variants that Won Recent Wars

By Ajai Shukla

The 44-Day-War in 2020 between Azerbaijan and Armenia, followed by the Russia-Ukraine war that has raged for over a year, have both established a battle-winning weapon of modern warfare – the armed remotely piloted vehicle (RPV), usually referred to as the armed drone. Now India's military has begun equipping itself with variants of armed drones that could tilt battles in its

favour on the mountainous Sino-Indian frontier or in the deserts of Rajasthan, where Indian armoured forces battle against Pakistani tanks.

Over the coming week, the army will conduct tests in Pokhran of an “aerial targeting system” for the artillery directorate. It is called the PALM 400 – the acronym for “precision attack loitering system” – and is designed to fly over armoured vehicle concentrations, or areas where they are expected. When the armoured vehicles arrive in this “kill zone”, each PALM 400 picks out its target and fires an armour-penetrating projectile, penetrating it from the top, where its armour protection is the least. In mid-February, another PALM RPV passed a gruelling set of trials in the extreme altitudes of Sikkim. There, the RPV was fired from an altitude of 18,000 feet and, after loitering at 19,500 feet, fired a thermobaric warhead that struck a target 8 kilometres away.

The PALM 400 RPV is launched from a canister and can loiter (remain on station) over a kill zone for up to 120 minutes flying at 3,000-4,000 feet above the ground. It flies at 50-140 knots (90-260 kilometres per hour), giving it a range of over 100 km.

These capabilities have ensured the army has chosen AVision Systems from 21 companies in a global Request for Proposals (RfP). All that is left is for the PALM system to pass its trials in Pokhran. The PALM 400 claims to be an Indian product, since AVision Systems is a joint venture (JV) between Israeli firm, UVision Air Ltd and Hyderabad-based Aditya Precitech Private Ltd (APPL). The Indian firm has had a long association with the Defence Research & Development (DRDO) in various missile projects.

PALM RPVs employ state-of-the-art, stabilized, dual electro-optical/infra-red (EO/IR) cameras to identify and engage targets during day or night. Its high-end, homing capabilities ensure accurate tracking of static and moving targets. The RPV employs sophisticated navigation methods, which allow it to operate even in environments where the Global Positioning System – the navigation backbone for most missile systems – has been denied to the system.

Trials conducted so far have determined that the PALM 400’s design allows for exceptional manoeuvrability, and has a mid-air abort capability that allows automatic re-entry into loitering mode, re-engagement, or return to the recovery area using a parachute.

In trials, the system has demonstrated an ability to stealthily loiter above a target, gather intelligence and strike instantly at time-sensitive threats. The PALM 400 is also effective against strategic enemy targets with its customizable warhead designed to handle different types of targets.

https://www.business-standard.com/article/economy-policy/india-testing-battle-winning-weapons-from-recent-wars-123022801020_1.html

THE ECONOMIC TIMES

Wed, 01 Mar 2023

Wildlife Board Approves IAF Mountain Radar in Ladakh

With the National Board of Wildlife giving its approval, the decks have finally been cleared for the induction of the Indian Air Force's mountain radar in Ladakh, just off the proposed new IAF

base. A slew of new operational tracks to ensure better strategic connectivity to the critical boundary trijunction off Dokalam has also been approved.

Likely to come up soon, is an ambitious and long-debated plan to set up a High-Altitude Air to Ground Firing range in Ladakh to ensure battle readiness in hostile high reaches of the Sino-India border, ET has gathered.

At a meeting on January 27, the NBWL, chaired by Union Environment minister Bhupender Yadav, cleared the way for the transfer of 31.6 hectares of land from the Changthang wildlife sanctuary in Ladakh for the IAF's new mountain radar, minutes of the meeting show.

The radar is expected to be situated just off the proposed new IAF base which will come up across 500 hectares in the Changsheng sanctuary. The IAF base was given the green signal last year, as reported first by ET.

The mountain radar induction is part of the larger defence plan to ensure eyes on the LAC which has already come under strong radar coverage from the Chinese side.

The Centre had indicated in November 2022 that it was looking at deploying Rs 10,000 crore worth of radars, the bulk of which are made in India, along the LAC in view of the escalating border tension. The mountainous border area in Ladakh and the eastern sector is seen as short on radar coverage even as China has strengthened air defence on the other side of the LAC.

There is also a slew of strategic linkage projects that have been mooted by the defence forces for the eastern sector. At least six new operational tracks have been approved to enable movement of defence personnel and logistics at the Batang La trijunction between India, Bhutan and China and in the Nathu La sub-sectors. China has already built a road into the Dokalam plateau with a road to Gyemochen at the lower end of the tri-junction. India and Bhutan maintain Batang La, north of Gyemochen, as the tri-junction. Operational tracks around the same area are part of the larger plan to build better access for deployment to the narrow area at the end of the Chumbi valley. Forest land from the Pangolakha sanctuary, home to the Red Panda, has also been permitted for diversion to allow the construction of operational tracks around the Kupup sub-sector in South Sikkim, just off the contentious site of friction at Dokalam.

<https://economictimes.indiatimes.com/news/defence/wildlife-board-approves-iaf-mountain-radar-in-ladakh/articleshow/98316584.cms>

THE TIMES OF INDIA

Wed, 01 Mar 2023

Pakistan Drone Shot Down by BSF in December '22 was Flown in China too

Even as the detection of Chinese surveillance balloons carrying out hi-tech spying missions over the skies of various countries, including India and the US, continues to haunt the government, forensic analysis of a drone gunned down by the Border Security Force in Punjab on December 25 last year has revealed that it had been flown in China before being supplied to Pakistan. The

Chinese-manufactured drone flew multiple times in Pakistan before being shot down by the BSF, while it was on an India mission.

According to sources, the forensic analysis of the drone showed it had been flown once inside China on February 16, 2022, and then 29 times in Pakistan between September 25 and December 24, 2022, and then twice in India. The flying machine, a quadcopter, was found lying in the fields beyond the border fence in Rajatal village of Amritsar after being hit by the Indian troops.

“We are of the view that the Chinese drone could have been spying inside Pakistan also and transmitting information to its handlers in China,” said a source, adding that the coded coordinates revealed the machine had been flown in Fengxian district near Shanghai in China and over Khanewal city in Punjab province of Pakistan. Inspector general, BSF (Punjab frontier), Asif Jalal, confirmed that the forensic analysis of the drone had revealed, for the first time, that it had been flown in China before being supplied to Pakistan.

On February 19, the BSF, for the first time, shot down a commercial class drone, with an advanced encryption system capable of spying, near the Ghaniake border outpost in Dera Baba Nanak area of Batala in Punjab’s Gurdaspur district. Sources didn’t rule out the possibility of drones being used for spying. “It is not a hidden fact that China has been spying with high-end balloons and is capable of doing so with drones, too,” said a source.

<https://timesofindia.indiatimes.com/india/pakistan-drone-shot-down-by-bsf-in-december-22-was-flown-in-china-too/articleshow/98321884.cms>



Tue, 28 Feb 2023

A New Model of Nuclear Arms Control is Needed

By Rakesh Sood

Russian President Vladimir Putin delivered the State of the Nation address last week. Coming two days before the first anniversary of the Ukraine war, Kremlin watchers expected to hear about a new war strategy from the president. Instead, Putin shocked the world by announcing that Russia was suspending its participation in the United States (US)-Russia New START (a 2010 agreement for further reduction and limitation of strategic offensive arms). His announcement made it clear that the 20th-century model of nuclear arms control was dead.

New START limited each country to 1,550 deployed strategic nuclear warheads and 700 launchers (heavy bombers and long-range missiles). In reality, each has more than three times as many warheads, categorised as reserves and those awaiting dismantlement. In addition, Russia is estimated to have over 2,000 tactical nuclear weapons and the US, a few hundred. These two still account for over 90% of global nuclear arsenals.

New START, the sole bilateral nuclear arms control agreement in force, was to expire in February 2026. It would have lapsed in 2021 because Donald Trump was determined to bring China into the negotiations, a suggestion Beijing rejected. President Joe Biden’s election enabled the five-year extension, but discussions on a follow-up treaty proved elusive.

On-site inspections (each State is allowed 18 annually) under the treaty have been suspended since 2020, initially due to Covid-19 and then the Ukraine war. Last November, Russia postponed the meeting of the Bilateral Consultative Commission.

Putin claimed that his decision resulted from the US wanting to inflict a “strategic defeat” on Russia, and under the circumstances, the idea of nuclear inspections was “a theatre of the absurd”. He blamed Ukraine for mounting drone attacks against Russian air bases that host nuclear-capable strategic bombers, aided by the North Atlantic Treaty Organization’s intelligence. At least three strikes took place in December 2022 at Engels and Dyagilevo air force bases, though no significant damage was reported. Putin also hinted that the US was preparing to resume nuclear testing and declared that Russia would follow.

The Russian foreign ministry has stated that Russia will continue to abide by the (numerical) restrictions mentioned in the treaty. This has quelled apprehensions that Putin was triggering a new nuclear arms race with the US. However, since compliance mechanisms stand suspended and trust is at an all-time low, both States will be willing to believe the worst of the other. Both are engaged in extensive nuclear modernisation programmes exploring hypersonic missiles, glide vehicles, and low-yield warheads. In addition, offensive cyber capabilities and Artificial Intelligence developments create new risks for the integrity of nuclear command-and-control systems.

So far, China has been content with a minimum nuclear deterrent of around 300 warheads. In recent years, it is shifting to a more robust deterrent. Satellite imagery has revealed the existence of four new missile silo sites. In addition, it has tested hypersonic glide vehicles and a fractional orbital bombardment system, indicating that it now seeks to manage nuclear escalation to blunt the US’s nuclear coercive edge. In 2021, the Pentagon concluded that the Chinese arsenal will cross 1,000 warheads by 2030, a widely accepted view. The expectation is that as China enhances its early-warning satellite capabilities, it will transition from its current no-first-use posture to a launch-on-warning mode.

Last year, North Korea accelerated its missile programme, undertaking nearly 90 launches, unveiling the Hwasong-17, with an estimated range of 15,000 km. Activity at the testing site has led to speculation that North Korea may be planning to undertake a seventh nuclear test. Meanwhile, media reports indicate that in Iran, International Atomic Energy Agency (IAEA) inspectors have discovered traces of uranium enriched up to 84%, which is just short of the 90% level used to produce a nuclear bomb. Iran has denied enrichment beyond 60% and blamed IAEA for media leaks and unprofessional conduct.

New START is not the first casualty. In 2002, the US unilaterally withdrew from the 1972 Anti-Ballistic Missile (ABM) Treaty with the erstwhile USSR, which limited the deployment of ABM systems, thereby ensuring mutual vulnerability, a key ingredient of deterrence stability in the bipolar era. In 2019, the US accused Russia of violating the 1987 Intermediate Range Nuclear Forces Treaty and declared its withdrawal.

Today’s political disconnect is also evident in the Nuclear Non-Proliferation Treaty (NPT), the most successful example of multilateral arms control that has become a victim of its success. It succeeded in delegitimising nuclear proliferation but not nuclear weapons. This is why NPT Review Conferences have become increasingly contentious in recent years and failed to reach any consensus. Another multilaterally negotiated agreement, the Comprehensive Test Ban Treaty, was concluded in 1996 but has failed to enter into force even after a quarter century.

Major power rivalry is not new, but the difference is that it is no longer a bipolar world. The old model of nuclear arms control established during the Cold War, shaped by the bipolar politics of two nuclear superpowers, is untenable in the 21st century nuclear multipolar world. Instead, there are multiple nuclear equations — US-Russia, US-China, US-North Korea, India-Pakistan, India-China, but nothing is stand-alone. Further, nuclear rhetoric is rising, raising the spectre of growing nuclear risks.

During the bipolar era, there was a perception that with the advent of nuclear weapons, wars between major powers would be disincentivised. However, the real problem is that nuclear weapons did not create any incentives for conflict resolution. Putin's speech is merely a reflection of this reality.

<https://www.hindustantimes.com/opinion/a-new-model-of-nuclear-arms-control-is-needed-101677594281145.html>

ThePrint

Tue, 28 Feb 2023

Moscow Accuses US of Preparing a ‘Toxic Chemicals’ Provocation in Ukraine

The United States is planning a provocation in Ukraine using toxic chemicals, the Russian defence ministry said on Tuesday.

The ministry cited former U.S. ambassador to Russia John Sullivan as saying that “Russian troops plan to use chemical weapons in the special military operation area.”

“We regard this information as the intention of the United States and their accomplices to carry out a provocation in Ukraine using toxic chemicals,” Igor Kirillov, chief of the radiation, chemical and biological defence troops of Russia's armed forces said during a briefing.

He said that Russia “will identify and punish the true culprits.”

<https://theprint.in/world/moscow-accuses-us-of-preparing-a-toxic-chemicals-provocation-in-ukraine/1405830/>



Tue, 28 Feb 2023

China Deploys PHL-16 MLRS along Taiwan Strait

The People's Liberation Army Ground Force (PLAGF) has deployed the PHL-16 Multiple Launch Rocket System (MLRS) in its 73rd Group Army of the Eastern Theatre Command, which is in charge of dealing with conflicts around the Taiwan Strait.

A video clip released by state-owned broadcaster China Central Television (CCTV) confirms at least two PHL-16s in service with the PLAGF's 73rd Artillery Brigade of the 73rd Group Army. The system is manufactured by China North Industries Group Corporation (Norinco).

According to Janes Land Warfare Platforms: Artillery & Air Defence, the PHL-16 is based on a modified Wanshan WS2400 8×8 chassis. It has a four-door fully enclosed air-conditioned cab at the front with an additional fully enclosed crew cab to the immediate rear.

The PHL-16's armament systems can either be a 10 round that can fire 300 mm rockets with a range of 130 km or an eight round that can fire 370 mm rockets having a maximum range of 280 km. The system can also fire two 750 mm Fire Dragon 280A tactical missiles with a maximum range of 290 km. According to China's state-owned daily Global Times, the PHL-16 can even switch to TL-7B anti-ship missiles and 750 mm Fire Dragon 480 tactical ballistic missiles that can hit targets at 360 km.

<https://www.janes.com/defence-news/news-detail/china-deploys-phl-16-mlrs-along-taiwan-strait>

Science & Technology News

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Tue, 28 Feb 2023

ISRO Successfully Conducts Key Rocket Engine Test for Chandrayaan-3

The flight acceptance hot test of the CE-20 cryogenic engine that will power the cryogenic upper stage of the launch vehicle for the Chandrayaan-3 mission was successfully conducted, according to the Indian Space Research Organisation.

The hot test was carried out for a planned duration of 25 seconds at the High Altitude Test Facility of the ISRO Propulsion Complex at Mahendragiri in Tamil Nadu on February 24, the Bengaluru-headquartered national space agency said. "All the propulsion parameters during the test were found satisfactory and closely matched with predictions," an ISRO statement said on Monday.

The cryogenic engine will be further integrated with the propellant tanks, stage structures and associated fluid lines to realise the fully-integrated flight cryogenic stage, ISRO said.

Earlier this year, Chandrayaan-3 lander successfully underwent EMI/EMC test at U R Rao Satellite Centre here.

EMI-EMC (Electro - Magnetic Interference/ Electro - Magnetic Compatibility) test is conducted for satellite missions to ensure the functionality of the satellite subsystems in the space environment and their compatibility with the expected electromagnetic levels, it was noted.

"This test is a major milestone in the realisation of the satellites," ISRO had said.

Chandrayaan-3 interplanetary mission has three major modules: the propulsion module, lander module, and a rover. The mission's complexity calls for establishing radio-frequency (RF) communication links between the modules.

During the Chandrayaan-3 lander EMI/EC test, launcher compatibility, antenna polarisation of all RF systems, standalone auto compatibility tests for orbital and powered descent mission phases, and lander and rover compatibility tests for post landing mission phase were ensured, according to ISRO.

Chandrayaan-3 is a follow-on mission to Chandrayaan-2 to demonstrate end-to-end capability in safe landing and roving on the lunar surface. ISRO plans to launch the mission in June. It will be launched by Launch Vehicle Mark 3 (LVM3) from the Satish Dhawan Space Centre in Sriharikota (Andhra Pradesh).

The propulsion module will carry the lander and rover configuration till 100 km lunar orbit. The propulsion module has Spectro-polarimetry of Habitable Planet Earth (SHAPE) payload to study the spectral and polari metric measurements of Earth from the lunar orbit.

<https://www.indiatoday.in/science/story/isro-successfully-conducts-key-rocket-engine-test-for-chandrayaan-3-2340780-2023-02-28>

