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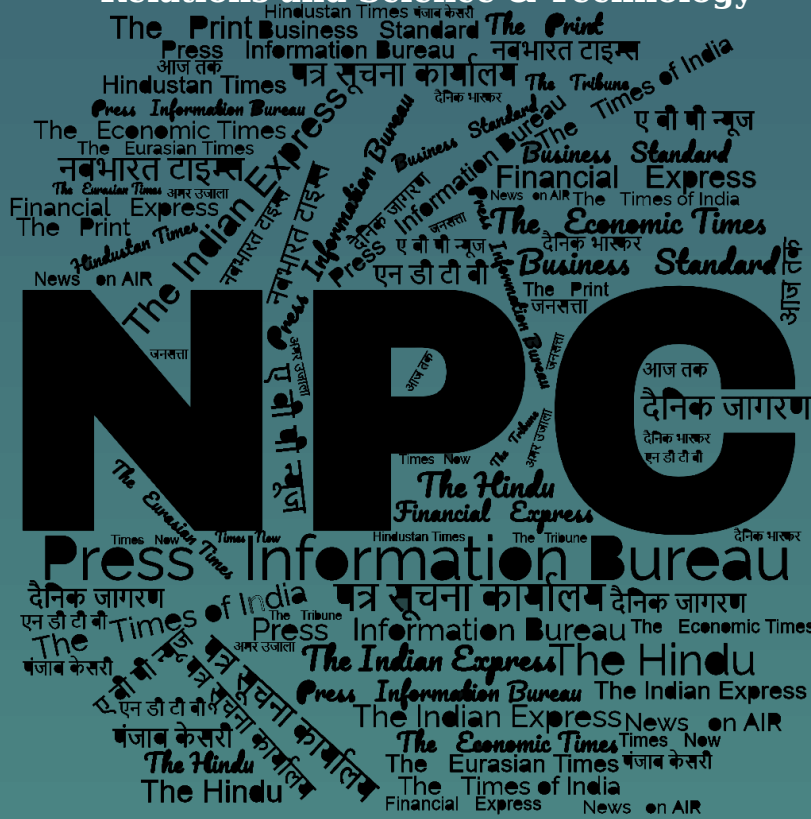
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Wed, 06 Dec 2023

MSME Partnership with Large Industries Key for Defence Indigenisation: DRDO

The working and contribution of MSME sector with the large industries as well as DRDO is essential to achieve government's target to increase the indigenous content in defence and aerospace sector to more than 70 per cent in the next 3-4 years, said Samir V Kamat, Secretary, Department of Defence R&D and Chairman, Defence Research & Development Organization (DRDO).

Delivering an inaugural address at the 3rd edition of India MSME Defence Week organised by EEPC India, Kamat spoke about the various initiatives DRDO has started to promote the MSME sector and one such initiative is Technology Development Fund (TDF).

“To promote MSME sectors, DRDO has started several initiatives. The most important initiative is the Technology Development Fund. This is a Fund which allows us to fund MSMEs to take technologies from TRL (technology readiness level) level 3-4 to TRL level 6-7 so that those technologies then be converted to products and brought to the market,” he said.

The DRDO Chairman said that the TDF scheme not only provides funds to MSMEs but also mentorship and hand-holding.

Earlier a maximum of Rs 10 crore per project was being provided under TDF but now the funding has been increased to Rs 50 crore per project, Kamat noted as he urged the MSMEs to take benefits of the scheme.

The TDF scheme seeks to promote the indigenous development of components, products, systems, and technologies by MSMEs and start-ups.

EEPC India Chairman Arun Kumar Garodia said that DRDO's support for MSMEs is helping to ensure that India has a strong and vibrant defence manufacturing sector.

“A strong foundation of R&D Innovations in industries is critical for a competitive defence sector. In this direction, the Defence Research and Development Organisation (DRDO) is helping MSMEs in several ways, including providing financial assistance, technical assistance, and facilitating collaboration between MSMEs and defence PSUs,” Garodia said.

<https://knnindia.co.in/news/newsdetails/sectors/msme-partnership-with-large-industries-key-for-defence-indigenisation-drdo>

Defence Strategic: National/International



Press Information Bureau
Government of India

Ministry of Defence

Wed, 06 Dec 2023

16th Edition of India-Germany Military Cooperation Sub Group Meeting Held in New Delhi

The 16th edition of the India-Germany Military Cooperation Sub Group (MCSG) meeting was conducted from 05-06 Dec 2023 in New Delhi.

The meeting was co-chaired from the Indian side by Brigadier Vivek Narang, Deputy Assistant Chief of Integrated Staff IDC (A), HQ IDS, and Col (GS) Christian Schmidt, Director, Department International Cooperation Armed Forces Office from the German side.

The meeting was conducted in a friendly, warm, and cordial atmosphere. Discussions focused on new initiatives under the ambit of existing bilateral defence cooperation mechanisms and further strengthening ongoing defence engagements.

India-Germany Military Cooperation Sub Group (MCSG) is a forum established to boost defence cooperation between both nations through regular talks at the strategic and operational levels between the Headquarters, Integrated Defence Staff, and the Department of International Cooperation Armed Forces.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1983276>



Press Information Bureau
Government of India

Ministry of Defence

Wed, 06 Dec 2023

Raksha Rajya Mantri Participates in the United Nations Peacekeeping Ministerial Meeting in Ghana

Pledges India's Support for UN Peacekeeping operations

Raksha Rajya Mantri Shri Ajay Bhatt participated in the 2023 United Nations Peacekeeping Ministerial Meeting in Accra, Ghana from 5-6 December 2023. In his address, he delivered a

statement on behalf of India in the first session on 06 December 2023, essentially outlining the challenges being faced by peacekeepers and role of women in peacekeeping in the current environment. He also announced substantial pledges on behalf of India to support the United Nations peacekeeping operations. India has been the leading troop contributing country to the United Nations peacekeeping effort. In the last seven decades, India has contributed more than 2,75,000 troops in 53 different missions.

On the sidelines of the United Nation Peacekeeping Ministerial meeting, the Minister also participated in bilateral meetings with several friendly foreign countries to discuss matters of mutual interest and defence cooperation. He also interacted with the Indian diaspora in Accra Ghana during the visit.

The United Nations Peacekeeping Ministerial Meeting is a biennial meeting organized by the United Nations in which all major donors and troop contributing states come together to discuss issues regarding peacekeeping operations under the UN charter.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1983235>



Press Information Bureau
Government of India

Ministry of Defence

Wed, 06 Dec 2023

Chief of Defence Staff Interacts with Senior Military Leadership During First Session of Combined Leadership Conclave in New Delhi

Three-day conclave to focus on geo-strategic issues, national security, jointness & 'Aatmanirbharta' in defence

Chief of Defence Staff (CDS) General Anil Chauhan presided over the first session of Combined Leadership Conclave and interacted with the senior leadership of the Armed Forces in New Delhi on December 06, 2023. The CDS provided an insight into modern warfare and national security.

The three-day conclave is focussing on geo-strategic issues, national security & defence, contemporary & emerging security challenges and integration & jointness for capability enhancement as well as 'Aatmanirbharta' in defence. Eminent personalities with renowned experience in respective fields will also interact with participants enlightening them about issues of national importance.

The conclave aims to serve as a development programme for senior officers of the three services, focused on regional and national security issues with a view to enhance synergy, both at operational and strategic levels within the Armed Forces.

Chief of Integrated Defence Staff to the Chairman, Chiefs of Staff Committee (CISC) Lt Gen JP Mathew and other senior officers of HQ, Integrated Defence Staff were also present during the event.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1983158>

CDS General Anil Chauhan to Open HAL's Avionics Exposition in Delhi

Hindustan Aeronautics Limited (HAL) will showcase its legacy in the design, development, and production of a diverse range of avionics systems during Avionics Exposition – 2023, which will be held in the capital at Dr Ambedkar International Centre on Thursday and Friday.

The Avionics Expo – 2023 will be inaugurated by the Chief of Defence Staff (CDS), General Anil Chauhan. Since the early 1960s, HAL has systematically built up its capability to design and develop fighter aircraft avionics, beginning with the HF-24 Marut fighter-bomber aircraft.

This equipped HAL and selected Defence R&D Organisation (DRDO) laboratories such as Aeronautical Development Establishment (ADE), Centre for Air Borne Systems (CABS), Combat Aircraft Systems Development and Integration Centre (CASDIC) and Aeronautical Development Agency (ADA) the ability to work together in developing advanced avionics for the Tejas light combat aircraft (LCA).

The Tejas LCA features world-class avionics including an unstable design and a quadruplex fly-by-wire flight computer. These features make the Tejas a highly manoeuvrable fighter that is also a highly stable aircraft.

HAL has designed a range of light and medium helicopters with advanced avionics in its Rotary Wing Research & Design Centre (RWR&DC).

In November 2008, HAL set up its Mission and Combat Systems Research and Design Centre (MCSRDC) for designing and developing mission and combat systems for fixed wing and rotary wing aircraft. This has enabled the Indian Air Force to use aircraft such as the Jaguar for many years more than its predicted service life.

“We will demonstrate HAL's capabilities and contributions toward self-reliance in avionics, to our stakeholders, including the Indian armed forces, the Ministry of Defence (MoD), the Ministry of Civil Aviation (MoCA), the DRDO and other important institutions,” said CB Ananthakrishnan, the acting chief of HAL. “The event will serve as a hub for professionals, industry leaders and stakeholders from the aviation sector... It is a testament to HAL's commitment to advancing aerospace technology in India,” said DK Sunil, HAL engineering and R&D chief.

The expo will display cutting-edge avionics systems deployed in various aircraft platforms, including advanced flight control systems, communication systems, and navigation systems.

Panel discussions will feature experts from the armed forces, HAL, partner organisations, and academia. Topics will span emerging trends in avionics, challenges in system integration, and the future of aviation electronics, providing a holistic view of the sector.

HAL Avionics Expo 2023 will also offer live demonstrations of avionics products and systems, providing an opportunity to experience their capabilities firsthand.

The event will serve as a hub for professionals, industry leaders and stakeholders from the aviation sector to establish meaningful networks and explore business partnerships.

Engineering students from and around Delhi have also been invited to gain experience.

https://www.business-standard.com/india-news/cds-general-anil-chauhan-to-open-hal-s-avionics-exposition-in-delhi-123120600717_1.html

Wed, 06 Dec 2023

Indian Army Advances Surveillance Capabilities with Cutting-edge Thermal Imaging Technology

The Indian Army is embarking on a mission to augment its surveillance capabilities by seeking 10,000 state-of-the-art Hand Held Thermal Imagers-Uncooled (HHTI-UC). These lightweight devices, weighing under 3.0 kgs, aim to empower soldiers with enhanced day and night surveillance capabilities, covering distances of up to 3000 meters.

These imagers go beyond the ordinary, integrating High Resolution Optical Viewer, Digital (low light), and Thermal (uncooled) sensors. Picture soldiers equipped with a powerful tool enabling them to navigate challenging terrains seamlessly, regardless of lighting conditions.

What's more interesting is the device's versatility. It not only excels in surveillance but also assists soldiers in judging distances, acquiring magnetic bearings, and relaying their location using built-in Satellite Navigation Systems like NAVIC. This multifaceted approach equips soldiers with a comprehensive tool for heightened situational awareness.

To ensure seamless operation, the device must support both wired and wireless connectivity, extending up to a minimum of 50 meters through standard interfaces. Beyond real-time monitoring, these imagers are designed to record and store a minimum of three hours of SD videos, facilitating post-analysis and reference.

Interested vendors have until December 26 to respond to the Indian Army's call. Following this, a Request for Proposal (RFP) is tentatively scheduled for June 2024. The procurement process unfolds gradually, with the desired quantity set for delivery within six to twenty-four months from the date of the Advance Payment. Essentially, the Indian Army is poised to embrace cutting-edge technology, ensuring soldiers have the tools needed to navigate and secure diverse landscapes effectively.

<https://www.financialexpress.com/business/defence-indian-army-advances-surveillance-capabilities-with-cutting-edge-thermal-imaging-technology-3330226/>

Wed, 06 Dec 2023

Army Finalises New Promotion Policy for Officers

The Indian Army has finalised a new promotion policy for the selection of officers to select ranks of colonels and above, with the review aimed at aligning the service's human resource policies with evolving operational requirements, officials aware of the matter said on Tuesday.

The new policy seeks to address cadre aspirations of all arms and services, strengthen meritocracy and help meet operational challenges, said one of the officials, asking not to be named.

It will also increase opportunities for promotion, said a second official, who also asked not to be named.

The current human resources policy of the army has stood the test of time and enabled the organisation to cater to all challenges, internal and external, the officials said. But all policies need to be dynamic so that the force remains at the forefront of further strengthening national power, they added.

“The new policy helps in aligning the leadership requirements to the present and emerging operational challenges, both in internal and external dimensions. It also addresses the aspirations of senior leadership by providing further promotional opportunities to officers in major general rank approved in ‘staff stream’ only to be eligible for promotion to the next rank in ‘staff only’,” said the first official.

“It addresses the issue of cadre aspirations of officers of all arms and services by providing almost equitable satisfaction in promotion boards and also strengthening meritocracy,” he said.

The new policy brings uniformity in the applicability of policies for all selection boards, the official added.

<https://www.hindustantimes.com/india-news/army-finalises-new-promotion-policy-for-officers-101701875313544.html>



Thu, 07 Dec 2023

MiG-21 Relevant even in Today's Air Combat, Says Group Captain Chetan Sharma

As the fabled MiG-21 prepares to fly into the sunset next year after more than six decades of service, Group Captain Chetan Sharma, one of the last two commanding officers of a MiG-21 squadron, described the fighter as one of the world’s most agile aircraft that can still hold its own in combat.

In an interview, Sharma talked about what makes the MiG-21 special, its capabilities, the safety record, how the Indian Air Force maintained the aircraft for so long and the glorious run of the workhorse.

Edited excerpts:

What makes the MiG-21 unique?

The Mikoyan-Gurevich designed the MiG-21 as a supersonic, all-weather interceptor aircraft. The design of this aircraft has a classical approach, with a small airframe wrapped around a very powerful engine and fitted with swept-back delta wings. This sleek aircraft with wedge-like wings looks like a dart flying in the sky. The aircraft’s simple flying controls, robust engine, modern weapons and avionics have allowed it to remain relevant even in today’s air warfare. The aerodynamic design allows it to perform exceedingly well in the supersonic regime and undertake all assigned operational roles efficiently. In 2000, IAF upgraded its MiG-21 Type-75 aircraft to the MiG-21 Bison. The upgrade involved re-equipping it with a modern radar, weapons and electronic warfare suite. The Bison has five hard points and can carry air-to-air and air-to-ground armament, besides an inbuilt 23 mm gun. It has a pulse Doppler radar to track and eliminate targets using the RVV-AE beyond visual range missile and the R-73E close combat missile.

The MiG-21's safety record has been worrying and it has often been called an unforgiving fighter. More than 400 MiG-21s have been involved in accidents during the last six decades. Your thoughts?

IAF has been operating MiG-21s for six decades and in large numbers. Almost 1,000. It has operated a raft of MiG-21 variants -- Type 74, Type 76, Type 77, Type 96, Type 75 or MiG 21 Bis and the MiG-21 Bison. The MiG-21 has been the most flown fighter aircraft in IAF. Hence, the number of accidents may appear to be more when compared to other fighters, which have undertaken relatively lesser amount of flying. It would be wrong to term the aircraft unforgiving. There are generations of IAF pilots who have done their ab initio fighter flying training on this legend. To meet operational roles, any machine is required to be operated to its limits. The safety margin is comparatively narrower in fighter aircraft. Mission profiles dictate how an aircraft is to be operated. Demonising the venerable steed does it a great disservice.

How has IAF managed to keep them flying for so long?

Over the years, IAF has learnt a lot and evolved to maintain as well as upgrade a fleet of fighters which formed the backbone of the country's air prowess for a long time. It is no mean feat to maintain an ageing fleet for so long. We were able to do so by adopting a slew of measures including efficient logistics management, accurate demand forecasting and extensive coordination with supply agencies. IAF has also aggressively pursued self-reliance by procuring spares from local sources. This greatly reduced dependence on foreign vendors and enabled better serviceability of aircraft. Besides, it has been the hard work, dedication and perseverance of the men behind the machine that has enabled the fleet to undertake the assigned task.

What is the status of MiG-21 flying operations at the Nal airbase?

I will be flying a night sortie after this interview. The squadron is flying by day and night to meet its commitments. We are combat-ready and capable of executing any mission assigned to us. The MiG-21 has still not run out of juice. It can hold its own in combat.

Can you share some history and achievements of the No 3 Squadron "Cobras"?

It was raised in Peshawar in 1941 as a fighter reconnaissance squadron with six Audax aircraft, eight officers and 78 airmen. During World War II, the squadron participated in operations in the North-West Frontier Province as well as in the Burma Campaign. After Independence, the squadron saw action during the wars of 1965 and 1971 with Pakistan. It has the rare distinction of operating 10 different types of aircraft. It has never been number-plated --- discontinued operations awaiting induction of new aircraft. Flight Lieutenant MM Engineer (later air marshal) of the squadron was awarded the Distinguished Flying Cross during the Burma Campaign of 1945. The squadron was awarded six Vir Chakras, three Vishisht Seva medals and seven mention-in-despatches for its role in the 1965 and 1971 wars. The Cobras have the proud distinction of producing six Chiefs of the Air Staff --- four for IAF and two for the Pakistan Air Force.

The Cobras are among the last generation of MiG-21 pilots in the country. What will you miss most about the MiG-21 era?

It is one of the most agile aircraft in the world. Despite its conventional controls, the MiG-21 can achieve a rolling rate of 270 degrees per second. It can be handled well at speeds ranging from less than 300 kmph to 1,300 kmph. It has a good thrust-to-weight ratio that makes it very potent in close combat. It will leave its own mark in the annals of Indian military history. It is an honour to be referred to as the last of the MiG-21 pilots.

<https://www.hindustantimes.com/india-news/ht-interview-mig-21-is-one-of-the-world-s-most-agile-aircraft-says-group-captain-chetan-sharma-101701889056200.html>

‘Exercise Vajra Prahar 2023’: India, US Forces Conduct Joint Drills in Meghalaya

As part of ‘Exercise Vajraprahar 2023’, the Indian Air Force (IAF) and Individual Aunmentees (IA) conducted various joint drills on Wednesday.

During the ongoing exercise, troops from both countries conducted exercises in a Mi-17 Hepr at Shillong’s Umiam Lake.

Additionally, helocasting operations were also carried out displaying High standards of precision, synergy and professionalism.

The 14th edition of the Indo-US Joint Special Forces exercise, ‘Vajra Prahar 2023’, commenced at the Joint Training Node, Umroi on November 21, the Ministry of Defence (MoD) informed through an official release earlier.

The US contingent is represented by personnel from the 1st Special Forces Group (SFG) of the US Special Forces. The Indian Army contingent is led by Special Forces personnel from the Eastern Command.

The ministry added that the joint exercise, conducted between the Indian Army and US Army Special Forcest’ aims at sharing best practices and experiences in areas such as joint mission planning and operational tactics.

The first edition was conducted in 2010 in India and the 13th edition of the Indo-US Joint Special Forces exercise was conducted at the Special Forces Training School (SFTS), Bakloh (HP). The current edition is being conducted in Umroi Cantonment, Meghalaya, from November 21 to December 11.

During the course of the exercise, both sides will jointly plan and rehearse a series of special operations, counter-terrorism operations, and airborne operations in simulated conventional and unconventional scenarios in mountainous terrain. Key highlights include ‘Combat free fall insertion of troops from stand-off distances’, ‘Waterborne insertion of troops’, ‘Precision engagement of targets at long ranges’, ‘Combat air control of fixed-wing and rotary-wing aircraft’ besides ‘Airborne insertion and sustenance of troops’, the MoD release added.

‘Exercise Vajra Prahar’ has evolved as a mechanism to exchange ideas and share best practices between the Special Forces of both nations, the release stated, adding that it is also a platform to enhance interoperability and strengthen defence cooperation between the armies of India and the United States of America.

<https://theprint.in/world/exercise-vajra-prahar-2023-india-us-forces-conduct-joint-drills-in-meghalaya/1875375/>

Thu, 07 Dec 2023

US Military Grounds V-22 Osprey Aircraft after Fatal Japan Crash

The U.S. military said on Wednesday it was grounding its fleet of V-22 Osprey aircraft after a fatal crash last week off the coast of Japan that killed eight people onboard.

Tokyo had already grounded its small fleet of the tilt-rotor aircraft, whose deployment in the country has been controversial, with critics saying the Boeing (BA.N) and Bell Helicopter developed Osprey is prone to accidents.

"Preliminary investigation information indicates a potential materiel failure caused the mishap, but the underlying cause of the failure is unknown at this time," U.S. Air Force Special Operations Command (AFSOC) said in a statement.

The latest crash happened during a routine training mission last week off Yakushima Island, about 1,040 km (650 miles) southwest of the capital, Tokyo.

At least 400 of the transport aircraft have been delivered and are mainly used by the U.S. Air Force, Marines and Navy, according to Boeing.

Immediately after the crash, Japan grounded its fleet and asked the U.S. to suspend flights of its V-22s operating in the country. The U.S. initially said it was suspending flights from the doomed aircraft's unit but said other Ospreys would continue to fly after safety checks.

It is not unusual for the U.S. military to ground entire fleets after fatal accidents. A spokesperson for Japan's defence ministry said on Thursday its aircraft remained grounded.

"It goes without saying that ensuring flight safety is the highest priority in the operation of aircraft," Japan's chief cabinet secretary, Hirokazu Matsuno, said on Thursday. "We will continue to request information sharing with the U.S. side to ensure flight safety."

The deployment of the aircraft in pacifist Japan has faced opposition, especially among residents of the country's southwest Okinawan islands, where there has been a large U.S. military presence since Japan's defeat in World War Two.

An Osprey crash there in 2016 also led the U.S. to ground its fleet of the aircraft in Japan.

According to the Flight Safety Foundation, at least 50 personnel have died in crashes operating or testing the aircraft. More than 20 of those deaths came after the V-22 entered service in 2007.

In August, three U.S. Marines died in an Osprey crash off the coast of northern Australia while transporting troops during a routine military exercise.

In 2022, four U.S. personnel were killed when an Osprey crashed in a remote part of northern Norway during a NATO training exercise.

<https://www.reuters.com/business/aerospace-defense/us-military-grounds-v-22-osprey-aircraft-after-japan-crash-2023-12-07/>

Lockheed Martin Tests JAGM Target Discrimination Tri-mode Seeker

US defence prime, Lockheed Martin, announced it has successfully conducted a guidance flight test for the Joint Air-to-Ground Missile Medium-Range (JAGM-MR), demonstrating the target discrimination capability of the missile's tri-mode seeker, according to a 5 December press release.

The flight test occurred at the US Naval Air Weapons Station China Lake Test Range in California's Mojave Desert on 2 December.

Joey Drake, programme management director of air-to-ground missile systems at the company, stated: "[T]he enhanced tri-mode seeker provides a new level of precision guidance and defence capabilities, allowing JAGM-MR to lock onto the selected target even when there [are] multiple targets in the field."

JAGM-MR's tri-mode seeker uses a near-infrared (IR) sensor, a low-cost imaging sensor incorporated into the missile guidance system, which uses a dual-mode sensor system. The IR sensor improves target tracking and guidance over a range of conditions and target sets.

Lockheed Martin had previously tested the sub-system in the same range on 16 November 2022, where it collected data to have it "functionally ready" this time around.

Meanwhile, this year's guided flight test demonstrated the maturity of the fully functioning tri-mode seeker while concurrently highlighting its ability to target engagement at an increased stand-off range.

Using IR for discriminated tracking

Drake champions the JAGM missile, with its functioning tri-mode concept, as a "turnkey solution" for the missile sector. This imaging concept is being widely developed across the defence industry recently; it is also seen in similarly layered systems.

Ahead of the Defence Security Exhibition International (DSEI) in London earlier this year, Army Technology spoke with Chess Dynamics, a British sensor technology provider and subsidiary of the pan-European Cohort Group, to discuss its land-based Hawkeye and sea-based Sea Eagle sensor systems.

"The key thing from the Chess perspective is the modularity of the system. So, you can have a range of vehicles that have different roles," Dave Eldridge, Sales and Marketing Director at Chess Dynamics, stated.

The electro-optical capability has built-in video tracking and target classification through Vision4ce's CHARM modules and AI technology. The system effectively filters the information and only flags objects that are deemed genuine risks or threats to the operator – in a similar way to Lockheed Martin's tri-mode seeker.

GlobalData intelligence tells us that the global military 'Electro-Optical and Infrared Market' was valued at \$10.1bn in 2022, which it expects to reach \$13.6bn by 2032.

<https://www.airforce-technology.com/news/lockheed-martin-tests-jagm-target-discrimination-tri-mode-seeker/?cf-view>

North Korean Hackers Stole Information on Seoul's Defence Technology?

South Korean police are investigating whether a North Korean hacker group, accused of stealing data from 14 entities, obtained information on defence technology including an anti-aircraft laser, a Seoul city police official said on Wednesday.

The probe, which is being carried out in conjunction with the U.S. Federal Bureau of Investigation (FBI), is trying to determine the extent of the data obtained by the group known as Andariel, Jeong Jin-ho, who heads a team at the Seoul Metropolitan Police Agency investigating the case, told Reuters. The U.S. Department of the Treasury in 2019 listed Andariel as a North Korean state-sponsored hacking group, focused on conducting malicious cyber operations on foreign businesses, government agencies and the defence industry.

Local media reported this week that the cache of data included key South Korean defence secrets.

The entities targeted included South Korean defence firms, research institutes and pharmaceutical companies, an earlier police statement said. Some 250 files, or 1.2 terabytes of information and data, were taken by the hackers, it said. A proxy server set up by the group was accessed in a district of the North Korean capital Pyongyang 83 times between last December and March, police said. The server was used to access the websites of the firms and institutions, with the group taking advantage of a South Korean hosting service that rents servers to unidentified clients.

The group also extorted 470 million won (\$357,866) worth of bitcoin from three South Korean and foreign firms in ransomware attacks, police said. North Korean hackers have been blamed for cyberattacks netting millions of dollars, though Pyongyang previously has denied being involved in cybercrime. A foreign woman was being investigated in connection with the ransomware attacks after some of the bitcoin were transferred through her bank account and withdrawn at a bank in China, police said. She has denied any wrongdoing.

<https://www.hindustantimes.com/world-news/north-korean-hackers-stole-information-on-seouls-defence-technology-101701852954127.html>

Science & Technology News

THE TIMES OF INDIA

PM Modi Congratulates ISRO for Bring Back Propulsion Module, Calls it 'Technology Milestone'

Prime Minister Narendra Modi has congratulated Isro for bringing back the propulsion module of Chandrayaan-3 spacecraft from the lunar orbit to the Earth's orbit, calling it "technology

milestone". Responding to Isro's post on the achievement, Modi stated on X, "Congratulations @isro. Another technology milestone achieved in our future space endeavours includes our goal to send an Indian to the Moon by 2040."

A day before, the space agency posted on X, "Chandrayaan-3 Mission: Ch-3's Propulsion Module (PM) takes a successful detour! In another unique experiment, the PM is brought from Lunar orbit to Earth's orbit. An orbit-raising manoeuvre and a trans-Earth injection manoeuvre placed PM in an Earth-bound orbit."

On August 23, the Vikram lander made its historic touchdown on the south pole side of the Moon, making India the first country to land on the uncharted territory of the Moon and subsequently, the Pragyan rover was deployed on the lunar surface. The scientific instruments on board the lander and rover operated continuously for one lunar day (14 Earth days) as per the defined mission life and completed the mission.

For the Propulsion Module (PM), the main objective was to ferry the lander module from the geostationary transfer orbit (GTO) to the final lunar polar circular orbit and separate the lander, it said. After the separation, the Spectro-polarimetry of HAbitable Planet Earth (Shape) payload in the PM was also operated, the space agency said. The initial plan was to operate the payload for about three months during the mission life of the PM. The precise orbit injection by LVM3 rocket and optimal earth or lunar burn manoeuvres resulted in the availability of over 100 kg of fuel in the PM after over one month of operations in the lunar orbit, it added.

Isro said it was then decided to use the available fuel in the PM to derive additional information for future lunar missions and demonstrate the mission operation strategies for a sample return mission. To continue SHAPE payload for Earth observation, it was decided to re-orbit the PM back to the Earth orbit. The mission plan was worked out considering the collision avoidance such as preventing the PM from crashing on to the Moon's surface or entering into the Earth's Geo belt at 36,000 km and orbits below that. Considering the estimated fuel availability and the safety to GEO spacecraft, the optimal Earth return trajectory was designed for October, the agency said.

"The first manoeuvre was performed on October 9, 2023, to raise the apolune altitude to 5112 km from 150 km, thus increasing the period of orbit from 2.1 hrs to 7.2 hrs. Later, considering the estimate of available propellant, the second manoeuvre plan was revised to target an Earth orbit of 1.8 lakh x 3.8 lakh km," the agency said. "The main outcomes of the return manoeuvres carried out on CH3 PM related to future missions include the planning and execution of a trajectory and manoeuvres to return from the Moon to Earth, the development of a software module to plan such a manoeuvre and its preliminary validation," it stated further.

<https://timesofindia.indiatimes.com/india/pm-modi-congratulates-isro-for-bring-back-propulsion-module-calls-it-technology-milestone/articleshow/105796318.cms>

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Exclusive: India's First Space Station Unit can be up in just 5 Years; 2047 Roadmap has Multiple Lunar Missions, Moon Tourism on Cards

Just weeks after the PMO made India's space roadmap public in October, Isro appears confident of building the first unit of the space station in just five years. In fact, Isro, whose roadmap for 2047

— 100 years of Indian Independence — has multiple lunar missions planned, is also planning to eventually offer Moon tourism.

A space station and the technologies Isro would have realised to make it a reality will serve the space agency well in implementing human mission to Moon, while Gaganyaan, which is being implemented in phases, will also give Isro a host of new technologies.

Isro chairman S Somanath told TOI: “We’ve not given the Prime Minister an over-ambitious target. 2040 is 17 years away and that’s a good time to develop technologies to send humans to Moon. Our work on the proposed space station too is progressing aggressively and we should be able to have the first unit ready by 2028.” As reported by TOI earlier, initial plans show that Isro is looking to build a space station — at an altitude of 120km to 140km — that can hold at least three astronauts in space for a period of time. These plans are subject to change.

If the first unit is ready by 2028 as Somanath has anticipated, India should be able to build the whole station as per the 2035 target announced by the PMO with a margin of a year or two.

NGLV key for station

“...We are very clear that the first unit will be achievable by 2028 as it is possible to do that using our current launch vehicle. Subsequently, we’ll need a bigger launch vehicle, the NGLV (next generation launch vehicle). We are hopeful that the NGLV will be ready around 2034-35. This is crucial to build the full station,” Somanath said.

A big team from Isro is already working on the proposed NGLV, whose architecture has been finalised. The team has even submitted a preliminary report which elaborates on what the rocket should look like — the technological input, approaches to be followed, where it should be done, what kind of manufacturing, etc.,

Somanath had said earlier that Isro wants it to be at least partially (the boosters) reusable, use new generation propulsion, have cryogenic propulsion in case Isro needs to improve payload and it must be manufacturable using the materials currently available in India.

Lunar roadmap 2047

Further, as per Isro plans made public by Somanath, the space agency’s roadmap for 2047 is dominated by several lunar missions, divided into three major phases: “Technology build up phase (2023-28), lunar reach-out phase (2028-40) and lunar base phase (2040-47)”. This journey would be punctuated by several other missions like development of a newer rockets, human-rating of the same, building of the space station and more.

While work on Chandrayaan-4, a sample return mission, is already afoot as reported by TOI in its December 6 edition, Isro has plans of launching Chandrayaan-5, 6 and 7 in the ‘lunar reach-out phase’. “There will be several uncrewed lunar missions before we attempt the human mission to Moon,” Somanath said.

In Chandrayaan-5, Isro hopes for a long term mission that employs radioisotope heater units (RHUs) — small devices that can provide heat through radioactive decay — and other technologies to manage the extreme temperature variations on Moon. By Chandrayaan-6, the plans are to look at building habitats while the follow-up Chandrayaan-7 would look at scaling up infrastructure building on Moon.

None of these missions are final or approved by the government as on date. But going by how aggressive Prime Minister Narendra Modi has been on using Space, Isro is expected to get the required backing at least at present.

<https://timesofindia.indiatimes.com/india/indias-first-space-station-unit-can-be-up-in-just-5-years-2047-roadmap-has-multiple-lunar-missions-moon-tourism-on-cards/articleshow/105791761.cms>

Empowering India's Navigation: Qualcomm and ISRO Collaborate to Elevate Geolocation Capabilities through NavIC Support

Qualcomm Technologies has joined forces with the Indian Space Research Organisation (ISRO) to announce a groundbreaking initiative. They are set to introduce support for India's Navigation with Indian Constellation (NavIC) navigation satellite system's recently launched L1 signals. This collaboration is poised to have a profound impact on select chipset platforms within Qualcomm Technologies' upcoming portfolio.

The primary goal of this collaboration is to expedite the adoption of NavIC and enhance geolocation capabilities across various domains such as mobile, automotive, and the Internet of Things (IoT). The collaboration leverages Qualcomm Technologies' pioneering advancements in location-based position technology, specifically in the Qualcomm® Location Suite.

One notable aspect of this collaboration is that Qualcomm Technologies' Location Suite will now extend support to up to seven satellite constellations concurrently. This includes comprehensive support for all of NavIC's L1 and L5 signals. The incorporation of these signals is anticipated to bring about significant improvements in location performance, reduce time-to-first-fix (TTFF) for position acquisition, and enhance the overall robustness of location-based services.

Francesco Grilli, Vice President of Product Management at Qualcomm Technologies, expressed enthusiasm about reinforcing their commitment to India. He highlighted the collaborative efforts with ISRO to accelerate the adoption of NavIC and pave the way for advanced geolocation applications utilizing the latest NavIC technologies.

Savi Soin, President of Qualcomm India, emphasized the company's strategic focus on establishing long-term partnerships within the Indian industry. The aim is to leverage Qualcomm's extensive engineering expertise and cutting-edge technologies to drive India-centric innovations across multiple sectors, including smartphones, IoT, and automotive.

Manish Saxena, Director at ISRO Headquarters, commended Qualcomm Technologies for its role in supporting NavIC L1 signals in upcoming mobile platforms. He emphasized the significance of NavIC as a crucial step toward utilizing space technology for national development and appreciated Qualcomm's contribution to accelerating its adoption.

Looking ahead, Qualcomm Technologies plans to introduce additional support for NavIC L1 signals in select chipset platforms starting in the second half of 2024. Commercial devices equipped with support for NavIC L1 signals are expected to hit the market in the first half of 2025. The company aims to showcase this support for the newly launched NavIC L1 signals at its Qualcomm Innovation Forum event in Bengaluru scheduled for mid-December 2023.

In conclusion, the collaboration between Qualcomm Technologies and ISRO marks a significant milestone in advancing geolocation capabilities and fostering innovation in India's technology landscape. The integration of NavIC signals into Qualcomm's chipset platforms is poised to open up new possibilities and enhance the user experience across diverse applications.

<https://www.financialexpress.com/business/defence-empowering-indias-navigation-qualcomm-and-isro-collaborate-to-elevate-geolocation-capabilities-through-navic-support-3329634/>

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