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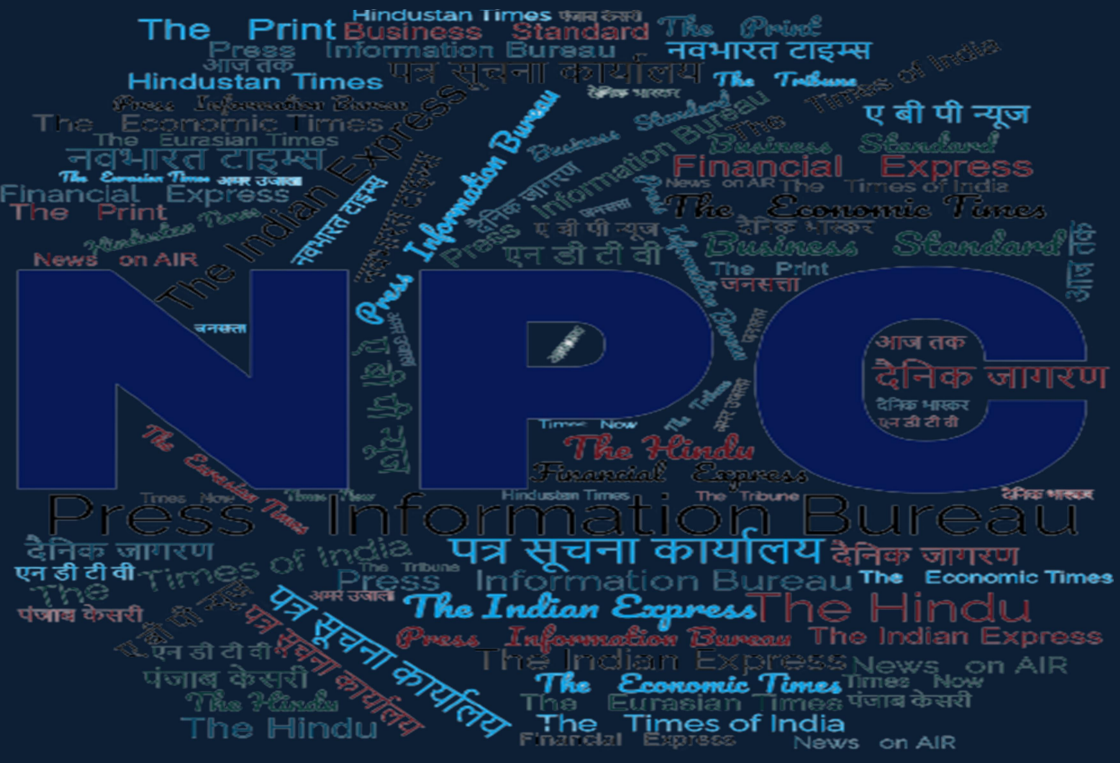

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Defence News

Defence Strategic : National/International

THE TIMES OF INDIA

Thu, 05 Jan 2023

With Eye on China, Rajnath Singh to Review Andaman and Nicobar Defence Infrastructure

Operational preparedness and infrastructure development in the country's only integrated military command at the Andaman and Nicobar archipelago, which can act as a pivot to counter China's expanding footprint in the Indian Ocean Region (IOR), will be reviewed by defence minister Rajnath Singh over the next two days.

In his first visit to the strategically-located 572-island archipelago as the defence minister, Singh will be briefed by Andaman and Nicobar Command (ANC) chief Lt-General Ajai Singh on the overall situation in the region on Thursday, officials told TOI.

Apart from interacting with troops, the minister on Friday will also be visiting naval air station INS Baaz located at Campbell Bay, which is the southernmost airbase of the Indian armed forces that overlooks the crucial Malacca Strait through which China's critical sea trade routes pass, while also dominating the Six-Degree Channel. INS Baaz in the Great Nicobar Island was commissioned in 2012 as part of the overall policy to counter China's strategic moves in the IOR as well as ensure security of shipping lanes.

The IAF also often operates Sukhoi-30MKIs and Jaguars from its Car Nicobar airbase, which is over 1,200-km from India's eastern coast but overlooks the maritime boundaries of Southeast Asia, though the fighters are not permanently based there. In effect, the archipelago provides India with crucial military surveillance, interdiction and operational turnaround capabilities to threaten China's `choke-points' in the region, a senior officer said. There are plans to progressively crank up military force-levels in terms of additional aircraft, helicopters, infantry battalions, artillery batteries, surface-to-air missile systems as well as develop the requisite military infrastructure to house them in the ANC. "In addition to major `dual-use' civilian projects, several military infrastructure development plans are also underway. Capability development and extension of runways at some locations to support operations by larger aircraft, for instance, are works in progress," a defence official said. But the going has been relatively slow at the ANC, which was established as India's first geographical unified command in October 2001 with all the manpower and assets of the Army, Navy, IAF and Coast Guard placed under a single commander-in-chief. Internecine turf wars among the three Services, general politico-bureaucratic apathy, fund crunches and major environmental concerns have all hobbled

the ANC from realising its full potential over the years. “Apart from the land borders, there is certainly the growing threat from China in the IOR. It’s critical to upgrade the ANC as India’s effective military outpost in the region,” another officer said.

https://timesofindia.indiatimes.com/india/with-eye-on-china-rajnath-singh-to-review-an-defence-infrastructure/articleshow/96747173.cms

The Tribune

Wed, 04 Jan 2023

Army to have Satellite-based System to Monitor and Control Troop Movements, Facilities in Remote Areas

The Indian Army, which has its elements deployed in multifarious and often difficult terrain, is developing satellite-based systems to track and monitor troop movements and facilities in remote areas. Thousands of troops and scores of army convoys move each day for operational, logistic and administrative purposes across the length and breadth of the country, while many military facilities are located in areas where communication is a challenge. The systems, with embedded artificial intelligence, will assist in effective monitoring and quick decision-making during contingencies.

The project to develop the systems has been placed in the 8th edition of the Defence India Start-up Challenge (DISC) that was issued in December 2022. DISC is an initiative of the Ministry of Defence for supporting start-ups MSMEs and innovators to create prototypes and commercialise products and solutions in the area of national defence and security.

“The armed forces operate in rugged and inhospitable terrain where the tracking of deployed troops or assets becomes challenging due to the topological conditions. In view, a pervasive network footprint offered by satellite communication could prove beneficial for such geo-tracking applications,” the DISC document reads. The system for tracking troops would have two elements - a ‘user’ element in the form of a small terminal that can be carried by mobile teams or vehicles to transmit its positional information to a centralised server using the satellite link, and a ‘logging’ element comprising a server along with the requisite digital capability for displaying and archiving the positional information transmitted by various user terminals.

A secure geo-satellite supported IoT platform for real-time monitoring of remote facilities and assets from dedicated control centres operated by the Army is the other system under consideration. “Facility monitoring assumes critical importance in both civil and military parlance. Many installations store a variety of equipment and stores, each requiring specialised storage and environmental conditions. Any deviation of these environmental specifications could be detrimental or hazardous,” the document reads.

“This becomes challenging when the storage facilities are located at remote locations. Hence a remote monitoring and control solution, based on Internet of Things (IoT) would be ideally fulfilling the requirement,” the documents adds. The army is looking at developing an IoT-based sensor-control loop working through satellite link that is able to offer machine-to-machine (M2M) communication for relaying the sensor data to a central location for archiving and

analytics. The system should be able to achieve automatic control action without human intervention in a near real-time manner.

https://www.tribuneindia.com/news/nation/army-to-have-satellite-based-system-to-monitor-and-control-troop-movements-facilities-in-remote-areas-467326

FINANCIAL EXPRESS
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Wed, 04 Jan 2023

Indian Army Floats Open Tender to Acquire 300 Logistics Rough Terrain Vehicles

The Indian Army has issued a Request for Proposal (RFP) to procure 300 logistics rough terrain vehicles (Lgs RTVs). These rough terrain vehicles are required for the transportation of the military in medium to high-altitude areas. The procurement will take place under emergency power granted to the Armed Forces which makes the acquisition process much faster. This procurement of Lgs RTVs will be processed under Buy (Indian) category of Defence Acquisition Procedure (DAP) 2020 through Fast Track Procedure.

The RFP mandates that these vehicles should be able to operate at an altitude of 16,000 feet. Their ability to operate in snow-covered undulating terrain with long endurance makes them ideally suitable for last-mile delivery (LMD) tasks, the RFP said.

Stringent criteria for Lgs RTV

The army puts stringent criteria for such vehicles which must be able to operate under extreme temperatures. The RFP mentions the minimum operating temperature range as between minus 20 degrees C to minus 10 degrees C while the maximum temperature range must be between 40 degrees C to 45 degrees C. Describing the equipment, the army says Lgs RTV must be highly mobile, multi-configurable, rough terrain capable vehicles for employment in medium to high altitude areas. The vehicle must have high off-road capabilities in inaccessible terrain to be able to operate on existing Animal Transport (AT) tracks and does not require any other specific tracks for their movement.

The RFP also mandates that the vehicle should be based on the concept that it can quickly be customised for different missions from loading to evacuating casualties during an operation. According to army officials, the procurement is being carried out through an Open Tender Enquiry and will be decided by an Empowered Committee (EC). According to the army's stringent timelines, the delivery of the equipment must be completed within 12 months from the date of signing of the contract.

The RFP also highlights the key aspect of Heliportability which means that the RTVs can be lifted or transported, using the existing fleet of Chinook/Mi- 26 helicopters. Besides, the vehicle should also have a roll cage or a rollover protection system.

The army's mountainous challenge

The rough terrain vehicle family consists of light, tactical, off-road vehicles designed and manufactured specifically for use by military and highly trained law enforcement officers. The most unique aspect of RTVs is the ability to carry multiple payloads due to unique payload integration technology basis the customisation.

The Indian army has been scouting for such capabilities in light of recent India- China standoffs across the high-altitude terrain. This adds to the forces' ability to improve upon the troops-to-ground ratio giving personnel greater flexibility in movement. The Indian army has to operate across vast High-Altitude Areas (HAA) and rough terrain regions which are accessible only by road and air. In fact, these areas are only open for a few months. Besides the troop movement, the army needs steady supplies throughout the year during deployment. The Indian army maintains a huge contingent of troops—more than 12 divisions – across the HHA region which makes it the largest mountain fighting force in the world.

https://www.financialexpress.com/defence/indian-army-floats-open-tender-to-acquire-300-logistics-rough-terrain-vehiclesnbsp/2936672/

The Tribune

Thu, 05 Jan 2023

To Counter China, Nyoma Airfield in Ladakh to be Full-fledged Base in 2 years

In a two-pronged strategy to match the Chinese airfields located across the Line of Actual Control, the Ministry of Defence has invited bids to upgrade the Nyoma airfield in eastern Ladakh into a full-fledged base with allied infrastructure. Separately, it has approved a new airfield near Kaza in Himachal Pradesh. The Border Roads Organisation (BRO) had, in December last week, invited bids for upgrading the Nyoma airfield at a cost of Rs 214 crore. Located close to the Indus and some 180 km south-east of Leh at 13,700 feet, it is a part of the Ladakh plateau and is already being used by helicopters and special operation planes such as C-130J, which can land on mud. The plan now is to have a full-fledged fighter jet base that can launch and recover planes and also carry out minor maintenance jobs.

The BRO plans to complete the upgrade in two years, according to the tender document. The site is spread over 1,235 acres where a 2.7-km runway with allied military infrastructure will come up. The alignment at Nyoma is such that aircraft can land from both directions. The other important aspect is having an airfield at Rangrik in Spiti valley near Kaza. These parts of Himachal have a flat-plateau type terrain. Across the LAC in Tibet is located Chepzi, the place from where Chinese troops come for patrolling close to Chumar and Demchok. The airfield will connect civilian flights too as the Spiti valley gets blocked due to snow in winters.

US-based policy research organisation, The Center for Strategic and International Studies (CSIS), had in March released its report "How Is China Expanding its Infrastructure to Project Power Along its Western Borders", which says "China has been constructing or upgrading 37 airports and heliports in Tibet and Xinjiang since 2017". "The pace of this activity sped up

significantly in 2020. That year alone, China began constructing seven air facilities and initiated upgrades at seven others," the report said.

Air power expansion is being supplemented with new road, rail and infrastructure-enabling rapid movement of troops, etc. In 2021, China completed the construction of a road and tunnel system connecting Nyingchi (facing Arunachal), allowing military easy access to the LAC.

https://www.tribuneindia.com/news/nation/to-counter-china-nyoma-airfield-in-ladakh-to-be-full-fledged-base-in-2-yrs-467406

FINANCIAL EXPRESS
Read to Lead

Wed, 04 Jan 2023

National Geospatial Policy 2022: Expert Anticipates Scope for Potential Data Violation

By Huma Siddiqui

The National Geospatial Policy 2022 recently notified is aimed to set up high resolution topographical survey and mapping, with a high-accuracy Digital Elevation Model (DEM) for the country by 2030. This is a vibrant initiative to promote the Start-Up & reduce the last mile dependencies on the foreign soil. But there are certain issues which need immediate attention.

Geospatial data can be described as complex data objects with complex relationships among them. Securing this type of data poses major challenges and bottlenecks that are yet to be fully understood and addressed. Access control and privacy pose many issues, such as the unit of protection. According to an expert and sources in defence and security establishments Geospatial data play a vital role in a wide spectrum of frequencies for critical data management applications, such as military operations, disaster and emergency management, environmental monitoring, land and city planning.

"All these require coordination among diverse organizations, their data repositories, and users with different responsibilities need to be clearly identified. Although a variety of models and techniques are available to manage access and share geospatial data, very little attention has been paid to addressing the National security concerns, such as access control, securities and privacy policies, the development of secure and in particular interoperable GIS applications in the areas of Defence (Tri-Services). And, how will the framework work?," Dr (Prof) Nishakant Ojha, Advisor Cyber & Aerospace Securities, explains to Financial Express Online.

In his view "if the entire body of geospatial data would be made available by simply integrating the data from thedifferent repositories, there is severe chances of potential data misuse and privacy violations. And "also sensitive information such as building ownerships might be revealed or information about critical infrastructure could become publicly accessible and it is a major concern in context to the applications in Defence (Military Assets)." Given the number of people and organizations involved in a disaster preparation scenario, security measures must be taken to provide users and applications only with data on a need-to-know basis.

Security Concern

Security issues for geospatial data are different and in many ways more complex than security issues for relational data. These differences concern both the data organization and structures, and in particular the ways the data are manipulated & used," said a senior officer who wished to remain anonymous. In a GIS, data is typically organized in different thematic layers; these layers, which can be large in number, represent different aspects of an application domains and areas. Also the same spatial region can be represented by either field-based data, i.e., satellite imagery or map data, or by vector-based data, i.e., a collection of possibly complex geographic features. Because of the organization in layers, the same geo-references feature, e.g., a building or road can be represented in different layers and ways as it is very common practice.

"In terms of data usage and its further applications, many applications generating and using geospatial data are dynamic as the set of subjects and geographic features may dynamically and rapidly change, as in the case of dynamic GIS coalitions for emergency response. Moreover, in such a context, one may need to combine data from several sources that are independently administered and therefore depicted by heterogeneous security policies. Such usage requires different approaches to architecting the data, security solutions," Dr (Prof) Nishakant Ojha states.

Solution

According to Dr Ojha, a clear roadmap should be drawn and SOP should be developed in National Geospatial Policy 2022 for the National Securities Issues for the country where in it is the three services, Para military or Critical Infrastructure Sectors.

In a nutshell: Military to Civilian organisation

According to the notification the Geospatial Data Promotion and Development Committee (GDPDC) will have representatives from various Departments and Ministries, including a Department of Defence Representative.

The Survey of India (SoI) would become an entirely civilian agency. Defence stream recruitment in SoI would cease, and defence stream officers assigned to SoI would be returned permanently to the Military Survey, Ministry of Defence.

The Indian armed forces have their own cartographers, and the civilian nature of the stream has expanded, so the government has decided to hive it as a civilian organisation.

Origins of Survey of India (SoI)

The origins can be traced back to the time of Lord Clive, who commissioned a major-ranking officer to produce a map of Bengal. There were difficulties between the military staff and the civilian staff after independence. Specialised training is provided to officers recruited from the Army Corps of Engineers for this purpose.

Defence Stream Deputy Superintendent of Survivors is trained in the Indian Institute of Surveying and Mapping (IISM) in Hyderabad. The Indian Army has its cartographers, and because the civilian nature of this stream has grown, the government has opted to restructure it as a civilian organisation. The Indian armed forces now have their own mapping equipment, including satellites.

https://www.financialexpress.com/defence/national-geospatial-policy-2022-expert-anticipates-scope-for-potential-data-violation/2936736/

The EurAsian Times

Wed, 04 Jan 2023

As India, China Clash near LAC, How Prepared is Indian Air Force to Challenge Rapidly Growing Chinese PLAAF

By Air Marshal Anil Chopra (retired)

The India-China showdown continues in Ladakh, and the recent incident in Tawang shows that China continues to be aggressive and sometimes belligerent.Xi Jinping's further consolidation of hold over all instruments of Chinese power and increasing forays into Taiwanese and Japanese ADIZ indicate Communist Party's sudden desire to dominate the world. China continues to spend large sums on the modernization of the armed forces. They realized early that one who controls aerospace controls the planet.

Airpower today is the dominant means of prosecuting war. It is inherently strategic, simultaneously provides conventional deterrence, and offers prompt multiple response options to the political leadership. Aerospace offers speed, range, accuracy, and lethality for achieving military effects. Airpower and the future of all warfare are intertwined. Air Campaigns can be executed simultaneously against different spread-out target systems. It can provide both kinetic and non-kinetic options with pinpoint accuracy. Airpower has a direct influence on the outcomes and actions of the surface forces. Air superiority will continue to be a prerequisite for all operations on the surface to succeed. Even armies and navies want to spend more on air assets.

IAF's Current Combat Assets

Indian Armed forces are expected to fight on both fronts simultaneously a war at 30 days (intense) and 60 days (normal) rates. The Indian Air Force (IAF) which has an authorized strength of 42 fighter squadrons, is today down to 30. These include two Rafale, 12 Su 30MKI, 3 MiG 21 Bison, three MiG 29 and Mirage 2000, 5 Jaguar, and two LCA.

IAF's Rafale, armed with Meteor and MICA beyond visual range (BVR) air-to-air missiles, and a modern EW suite, are much better than China's J-10, J-11, Su-27, and Su-35 fighter jets. The Sukhoi Su-30MKI serves the IAF as the primary air superiority fighter capable of air-to-ground strike missions. Mirages and MiG 29s have been upgraded. The LCA's have now become operationally viable assets. With 11 C-17 and C-130 each, 17 IL-76, and over 100 upgraded An-32, IAF has significant cargo and troop lift capability. Similarly, having inducted 15 Boeing Chinook heavy-lift and 22 Apache AH-64E attack helicopters and already a substantial fleet of 240 Mi-17 series medium-lift helicopters, nearly 100 ALH variants, and smaller Chetak/Cheetah fleets, IAF is in a good position for rotary wing assets.

IAF has only three large Airborne Early Warning and Control (AEW&C) aircraft and two indigenous DRDO-developed AEW&C aircraft. Similarly, IAF has only six IL-78 Flight Refuelling Aircraft (FRA). Both these fleets are highly inadequate for a continental country like India, which also covers the Indian Ocean Region.

India has a well-covered and integrated air defense radar cover. IAF continues to operate some legacy surface-to-air missile systems like the SAM-3 Pechora and SAM-8 OSA-AK. The AD

coverage can be considered significant with the induction of many indigenous Akash AD systems and the already inducting five S-400 systems.

More systems will need to be inducted to cover the sizeable Chinese border. With the induction of the MICA, Meteor, Astra, SCALP, BrahMos, and Hammer, among others, IAF has a significant aerial weapons inventory. Numbers will have to go up.

Rapidly Growing PLAAF

China's People's Liberation Army Air Force (PLAAF) has a more extensive and growing fighter fleet and advanced air defense systems. Yes, they must contend with the much more powerful U.S. Air Force. PLAAF currently has nearly 1,700 fighter/bomber aircraft, of which 800 are fourth-generation-plus aircraft, including over 150 fifth-generation J-20s. Their second fifth-generation aircraft, FC-31/J-31, has got fresh funding. PLAAF has nearly 170 H-6 long-range strategic bombers with some variants that can carry up to six cruise missiles in a 1500-kilometer range. The H-20 Stealth bomber is on schedule and may get launched by 2025. PLAAF also has dedicated EW aircraft. The Y-20 large transport aircraft (66 tons) is being inducted in large numbers. Their other strategic assets, such as indigenous AEW&C aircraft and Flight Refueller (FRA), are growing, though the numbers are still small for their size. China has already tested a hypersonic weapon, which puts it much ahead. China also has an edge with a huge surface-to-surface missile inventory. China's biggest strength is its indigenous aircraft industry which produces all types of aircraft and advanced helicopters.

China has vast Unmanned Combat Aerial Vehicles (UCAV) and a small drone fleet of indigenous designs. China also has significant Maritime air power, with PLA Navy (PLAN) having two operational aircraft carriers and nearly 600 aircraft. Two more carriers are under construction, and two further, larger ones are on drawing boards. It can be seen that China has significant air power.

Pakistan Air Force (PAF)

PAF has 20 squadrons with around 400 fighter aircraft. Indications are that the numbers will go up to 24-25 squadrons. Older fleets are being replaced. JF-17 Block III and J 10 C are under induction. The U.S. has cleared the F-16 spares package. In the long term, PAF could have over 250 JF-17s, 75 F-16s, and around 50 J-10 C (two squadrons). PAF is reportedly also seeking the J-20, though that seems premature.

PAF has a mid-sized transport aircraft and helicopter fleets. But they have acquired a significant number of Chinese UAVs and will soon set up production of Wing Loong UCAVs in Pakistan. The PAF is primarily air defense orientated. While PAF does not pose any significant threat to India, it has been exercising closely with PLAAF and has the advantage of equipment interoperability. It could also allow the PLAAF to use some of its airfields. IAF has to thus factor in a two-front confrontation.

Targeted End State IAF

IAF's remaining MiG-21 Bison squadrons will phase out by 2025. The remaining fighter fleets would continue till 2030. By then, additions would be just four squadrons of LCA Mk 1A. At best, one squadron of LCA Mk 2 may induct. If a decision is taken in time, 1-2 squadrons of the newly imported fighters may induct. IAF could thus still be hanging around 33-34 squadrons. Not an excellent state of being in. I assess that the IAF could reach 42 squadrons by 2038 only if the nation takes a resolution and all actions go by plan. The end state could be 14 squadrons of

Su-30 MKI, two each of Mirage 2000 and MiG 29, 12 squadrons of LCA variants, two of Rafale, six of the new fighter, and four of Advanced Medium Combat Aircraft (AMCA). This would make it 42. Effectively IAF would have to stretch the Mirage and MiG 29 fleets. These figures are highly achievable as long as timely funds are allotted and there are no serious development delays in AMCA. IAF must also target ten large and ten smaller AEW&Cs, and at least 12 FRA aircraft. DRDO is working on indigenous makes of these types based on Ex-India Airbus aircraft. It will take nearly 6-8 years to induct them. Until then, we must accelerate the two AEW&C under acquisition, and also, it would be a good idea to take a few FRA on lease.

IAF must have a significant fleet of UCAV systems, including the indigenously developed DRDO's "Ghatak." IAF needs a substantial number of drones and drone swarms. IAF should also have a large inventory of aerial missiles with longer ranges, including the later variants of BrahMos and Astra missiles.

China-Centric Asset Positioning And Infrastructure

India's military assets and infrastructure were Pakistan border-centric for a long time. This is fast changing for both infrastructure build-up and assets position. While border roads and connectivity are being improved, IAF has upgraded its Advanced Landing Grounds (ALG) near the China border. IAF airfields are getting hardened aircraft and equipment shelters. The process needs further acceleration.

IAF now has a significant number of Su-30 MKI squadrons facing China. Also, new acquisitions like Rafale, C-130 J, Chinook, and Apache helicopters have all been located in the eastern sector. The same is also applicable to air defense systems and weapons positioning.

Indigenous Aircraft Production Eco-System

The LCA Tejas is a success. The fighter aircraft production eco-system is now in place. The LCA production rate is still very low. For IAF to get back numbers, HAL and a private player must produce 18 aircraft a year. The LCA Mk1A and Mk2 development must be hastened. A task force must drive the AMCA.

The helicopter production eco-system is also now entirely in place. A new helicopter factory is set up at Tumkur. Inductions in the armed forces are on pace. The 70 HTT-40 basic trainer aircraft have been ordered. The long-delayed Intermediate Jet Trainer (IJT) trainer needs to be pushed.

The Saras small transport (19 seats) is still struggling, and the midsized, 80-90 seat Indian Regional Jet (IRJ) has still to take off. Local production of the C 295 W should boost indigenous transport aircraft production, but the timelines are nearly 8-10 years.

India's efforts on long and medium-range SAMs and air-to-air missiles must continue. The Uttam AESA has to succeed and increase performance for LCA Mk II. Airborne electronic warfare, airborne processors, and mission avionics need more work. Meanwhile, India continues to struggle with its aero-engine program. We need to convert pure research into products that can be physically inducted into the armed forces.

Synergy At National Level

India must announce its National Security Strategy (NSS) from where it will flow the political direction to the armed forces. Due to the multi-dimensional nature of conflict, increasing levels of synergy amongst the armed forces and civil agencies is operationally critical. For the surface

forces to succeed, IAF has to dominate the skies with at least local superiority in time and space. For acquiring newer technologies, special national-level task forces would have to be set up in areas such as aero-engines, stealth, artificial intelligence (AI), advanced robotics, drones and swarming, combat air teaming, directed energy weapons, cyber, electronic warfare, quantum radars, sixth generation technologies, and hypersonic weapons. Academia and the private sector would have to be involved.

Atmanirbharta, The Only Answer

India has a great industrial base and significant defense equipment demand to allow an advantage of scale. If India can succeed in its missile, space, and nuclear programs, it can do the same in defense production. The Make-in-India, Atmanirbharta, in defense, is being aggressively pushed at the highest levels. The thrust is to promote 'Made-by-India' as a first choice. 'Make-in-India' is being driven as an interim solution. Big private industrial houses like Tata, L&T, Mahindra, Adani, Bharat Forge, and many others have seriously come into defense manufacturing.

India's target is to initially reduce defense imports from 70 percent to 40 percent. A positive indigenization list is fairly exhaustive and should help. The government formulated the 'Defense Production and Export Promotion Policy 2020' to provide impetus to self-reliance in defense manufacturing. The target of a turnover of Rs. 1 lakh 75 thousand crores (US$ 25 billion), including export of Rs. 35 thousand crores (US$ 5 billion) in aerospace and defense goods and services by 2025, is ambitious but achievable. There is also perhaps a case for increased privatization of DPSUs. The joint-venture route for radars and missiles has worked reasonably well with Israeli and Russian firms. India has had great success in ship-building, which needs to be replicated in aerospace.

Tata Aerospace and Defence have been making aero-structures for the Boeing AH-64 Apache and CH-47 Chinook, Sikorsky S-92 helicopters, and Lockheed C-130Js. GE has a huge India presence. Tata group works with GE to manufacture India's CFM International LEAP engine components. Lockheed Martin selected TASL to produce F-16 wings in India.

EADS unit Cassidian plans to make India a hub for a large number of defense products that are locally manufactured and also offer technological value. A large MRO market can also create an R&D base for engineering services. Adani-Elbit JV will make Hermes 900 UAVs in India.

Bharat Forge is a major player in the artillery and specialized vehicles segment. Dynamatic Technologies makes assemblies of vertical fins for Sukhoi 30 MKI fighters and front fuselage for LCA. VEM Technologies manufactures center fuselage for LCA Tejas. Several small companies – such as Avasarala Technologies, DefSys, Ravilla, and Taneja Aerospace – have recently acquired advanced technological capabilities.

Indian companies have the global opportunity not only due to cheaper skilled labor but have also developed the ability to manufacture accurately to specifications, particularly in aerospace, metalworking, and electronics. An estimated 24,000 MSMEs are currently involved in the defense supply chain, and the contribution of private players in the defense sector has steadily grown over the years, with more than 500 licenses issued to private companies.

Imperatives For IAF

Some uninformed cynics have suggested that since Rafale and Su-30 MKI can achieve much more significant effects than the older MiG 21s, why should IAF continue to seek 42 squadrons? The argument is flawed. While IAF has had a study growth in capability, the adversaries,

especially China, have been leaping ahead with fifth-generation platforms. They are not cutting down numbers. The type of aircraft and weapon platforms must be comparable to the adversary.

IAF must get back to the authorized force levels of 42 squadrons. While indigenization must be pushed, the interim number gap must be filled with imported make-in-India fighters. IAF also urgently needs additional AEW&C and FRA. The future being unmanned, IAF needs to invest more in combat UAVs, including the cost-effective kamikaze drones, as seen in the Ukraine conflict.

India must also defend itself against a possible sizeable Chinese surface-to-surface missile (SSM) attack. We need more air defense SAM systems of the S-400 and Iron Dome class and the many indigenous air defense systems under development. It is essential to have a larger ammunition and missile stocking. SSMs and Cruise missiles are going to be necessary. Network-centric warfare means the need for better cyber and electronic warfare capability, securing own networks, and denying the same to the adversary. Much more needs to be done on this score.

Way Ahead

The government has acknowledged India's threat from two fronts. Yet it is also clear that a full-scale war between neighbors is unlikely. China will continue to create border situations to test India's resolve to defend itself. But deterrence is possible only through strength.

The gap with China is continuing to increase. The serious backlog of IAF's modernization needs to be addressed without delay. The obsolescence sets in much faster for aerial systems. It could also mean an increase in defense allocations. IAF is well trained and operationally well exposed. IAF has a clear advantage in more and better-located and equipped airfields than China. IAF can match the PLAAF, but IAF will be much better placed once the numbers increase. Time act is now.

https://eurasiantimes.com/as-india-china-clash-near-lac-how-prepared-is-indian-air-force-to-challenge-rapidly-growing-chinese-plaaf/

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Wed, 04 Jan 2023

The Race for the Indian Naval Fighter Contract

IDSA Comment

By Dr S. Samuel C. Rajiv

November 2022 saw the visit of the French Defence Minister Sebastien Lecornu as well as the US Secretary of the Navy Carlos Del Toro to India. Lecornu was in New Delhi for the Fourth India–France Defence Dialogue, where both countries decided to enhance military industrial cooperation with a focus on Make In India (MII). Apart from their interactions in New Delhi, Lecornu and Del Toro also visited Kochi, the headquarters of the Southern Naval Command, where the indigenously constructed aircraft carrier, INS Vikrant, is also based. The visits of the

French and the American delegations brought into focus their parallel efforts to secure the contract for equipping India's indigenous aircraft carrier with a fighter wing.

The Indian Navy's sole operational aircraft carrier, INS Vikramaditya, currently operates Mig-29K fighters. The choice of the Multi-Role Carrier Borne Fighter (MRCBF) programme to equip the INS Vikrant is between the twin-engined US Boeing F/18 E/F Super Hornet and the French Rafale Marine (M). The single-engine Tejas Light Combat Aircraft (LCA) was found unsuitable for aircraft carrier operations. The Ministry of Defence (MoD) issued a Request for Information (RFI) for MRCBFs procurement in January 2017 for 57 fighters, which was subsequently reduced to 26 fighters to be procured via the government-to-government (G2G) route. These include eight twin-seater trainer variants and 18 single-seater variants.

Aircrafts in Contention

Both the aircrafts in contention, the Rafale and the Super Hornet, did demonstration ski-jumps at the Shore-Based Test Facility (SBTF) at INS Hansa, Goa in January and June 2022 respectively. Boeing insists that the Super Hornet is fully compliant with the requirements of India's aircraft carriers, INS Vikramaditya and INS Vikrant and notes that the two-seater F/18 can also be used for land-based missions as well as a trainer aircraft.

The US aerospace major also highlights the fact that the aircraft is inter-operable with the Indian Navy's Boeing P-81 reconnaissance aircraft. Boeing notes that the P8I is operated by three out of the four Quad countries (US, Australia and India). Two out of the four Quad countries also operate the F/18 aircraft (US and Australia).

Boeing further reiterates that the same family of engines powers the F/18 and the LCA Tejas. While the General Electric (GE) F-414 powers the F/18, the US$ 716 million contract to supply 99 GE F-404 engines to power the LCA Mk-I A fighter aircraft was signed in August 2021. The MoD had earlier in February 2021 placed an order with Hindustan Aeronautics Limited (HAL) for 83 LCA MK-1A jets worth Rs 48,000 crore.

Boeing further reiterates that over 800 Super Hornets and its variants have been delivered worldwide and the massive scale will enable competitive incorporation of newly developed technology. The US aerospace major's 'By India-For India' sustainment programme is also expected to ensure a higher availability of aircraft for operational deployment. As for the other competitor, Rafale Marine, India has procured 36 Rafale aircraft for the Indian Air Force (IAF), the contract for which was signed in 2016. While the first aircraft was received in October 2019, all 36 were inducted by December 2022. Apart from France and India, Egypt, Qatar and Greece also operate the cutting-edge French fighter aircraft while the UAE signed a deal to acquire 80 Rafales in December 2021 and Indonesia signed a deal in February 2022 to acquire 42 Rafales.

The MRCBF options are slated to be an interim solution, before the Twin-Engined Deck Based Fighter (TEDBF) project comes to fruition. The project was approved in 2020, with the Preliminary Design Review (PDR) expected to be completed by mid-2023. The aircraft will be powered by the GE F414 engines—the same engines that power the F/18s, and is expected to be inducted by 2031–32. Both Dassault and Boeing are also competing for the multi-role fighter aircraft (MRFA) programme of the IAF, RFI for which was issued in 2018.

French Arms Exports to India

The Rafale is the latest in a series of fighter aircraft of French origin that have been operated by the IAF. French fighter aircraft in India's inventory date back to 1953, when the IAF acquired

the Ouragans (Toofani), becoming Dassault Aviation's first export customer. Subsequently, the IAF also procured the Jaguars (beginning from 1978) and the Mirage 2000, from 1982 onwards. India currently has more than 100 Jaguars and more than 50 Mirage 2000s (single and dual-seat versions). The Mirages were upgraded with new radars, mission computers and electronic warfare (EW) suites (from Thales) in 2011.

Prior to the 2016 Rafale G2G deal, the 2005 Scorpene deal for six submarines was another major acquisition from France. The first submarine, INS Kalvari was launched in 2015 and commissioned in 2017 while the sixth INS Vagsheer, was launched in 2022. The Scorpene and the Rafale deals accounted for India being the second biggest purchaser of French arms during 2010–20, after Saudi Arabia. While Saudi Arabia imported over Euros 9 billion from France, India imported arms worth Euros 7.2 billion. Egypt, Qatar and the United Arab Emirates, along with Saudi Arabia and India, made up the top five importers of French arms during 2010–20. Aircraft were the major category of French arms exports during 2010–20, accounting for a quarter of all its arms exports.

The Strengthened India–US Defence Relationship

Even as India's arms imports from France registered a massive jump in 2010–20, and irrespective of India's interim naval fighter choice, the India–US defence and strategic partnership has been significantly strengthened in recent times. India was designated as a Major Defence Partner in 2016. While US Foreign Military Sales (FMS) to India from 1950 to 2021 amounted to US$ 13.2 billion, US$ 4.7 billion (or 28 per cent) were during the period 2017–21. The authorised value of US defence articles and services through Direct Commercial Sales (DCS) to India has been over US$ 18 billion in the period 2010–21.

Some of the key equipment that have been procured include transport aircrafts (Lockheed Martin C-130J; 12 inducted), multi-mission helicopters (Boeing CH-47F I Chinook; 15 inducted), Anti-Submarine Warfare (ASW) maritime patrol and reconnaissance aircraft (Boeing P8-I; 11 inducted; 1 more ordered), and attack helicopters (Boeing AH-64E Apache; 22 inducted in IAF; six more ordered for Indian Army in 2020), ASW helicopters (Lockheed Martin/Sikorsky MH-60R; 24 helicopters worth US$ 2.6 bn to be inducted by 2025), heavy transport aircraft (Boeing C-17A Globemaster III; 11 inducted) and UAVs (General Atomics MQ 9 Sea Guardian; two leased). India–US joint ventures like the Tata Boeing Aerospace Limited (TBAL), established in 2016, has supplied over 150 Apache fuselages to Boeing's global clientele. At the India–US 2+2 Ministerial Dialogue held in April 2022, both sides also pledged to 'promote the means to encourage reciprocal participation of Indian and US vendors in each other's defence supply chains'.

Going Forward

If India opts for the Rafale Marine, as noted in this 9 December 2022 report, it will highlight the continued lack of success of US fighter aircraft manufacturers to become a part of India's inventory, despite long-standing and robust efforts. It will also signify an increasing share of European manufacturers in the Indian military aerospace market. This is in the light of the 2016 Rs 60,000 crore Rafale deal and the 2022 Rs 22,000 crore deal for 56 C-295 transport aircraft from Airbus, 40 of which will be manufactured at Vadodara by Tata Advanced Defence Systems Limited and Airbus Defence and Space. While the C-295 is a replacement for the IAF's HS-748 transport planes, it is also being seen as a possible replacement for the 100-odd AN-32s in the IAF fleet.

Even as the robust India–US defence and military partnership can be expected to absorb the near-term setback that could possibly flow out of India's interim choice for naval fighter aircraft, US aircraft engine manufacturers like GE will continue to be an integral part of indigenous fighter aircraft programmes like the LCA Mk 1 and Mk 2A.

https://www.idsa.in/idsacomments/the-race-for-the-indian-naval-fighter-contract-sscrajiv-040123

FINANCIAL EXPRESS
Read to Lead

Wed, 04 Jan 2023

Sharpening the Sword: The Role of Cognitive Psychology in Enhancing India's Defence Capabilities

By Raul Villamarin Rodriguez

Cognitive psychology is the study of how people process, store, and apply information. It has had a significant impact on defence technologies and manpower, as it helps to understand how the human brain works and how people make decisions, which is crucial in the development of effective weapons systems and training programs.

One key theory in cognitive psychology that has influenced defence technologies is the concept of attention. Attention is the mental process of selectively focusing on certain stimuli while ignoring others. This is important in defence as it allows soldiers and pilots to focus on important tasks and ignore distractions, which can be crucial in high-stress situations.

The theory of attention was developed by psychologist William James in the late 1800s, and it has been further refined and studied by many other psychologists over the years. One key thinker in this area is psychologist Daniel Kahneman, who won the Nobel Prize in Economics in 2002 for his work on decision-making and attention. Kahneman's work on the concept of "bounded rationality" has been particularly influential in the development of defence technologies. Bounded rationality refers to the idea that people are limited in their ability to process information and make decisions, and that they often rely on shortcuts and heuristics (rules of thumb) to make decisions.

Military applications

This concept has been applied to the development of weapons systems that are designed to assist soldiers and pilots in making decisions. For example, some systems use artificial intelligence (AI) to process vast amounts of data and provide recommendations or warnings to soldiers and pilots. This can help to reduce the cognitive load on individuals and allow them to focus on other tasks, such as navigating or communicating with other team members.

Another area of cognitive psychology that has had an impact on defence technologies is memory. Memory is the process of encoding, storing, and retrieving information. It is important in defence as it allows soldiers and pilots to recall important information, such as procedures, maps, and enemy positions.

The theory of memory has been extensively studied by psychologists, and there are several different models being proposed to explain how it works. One influential model is the "multi-store" model of memory, which was proposed by psychologists Richard Atkinson and Richard Shiffrin in the 1970s. This model suggests that there are three types of memory: sensory memory, short-term memory, and long-term memory. Sensory memory is the brief storage of information that is received through the senses, such as sight, sound, and touch. Short-term memory is the temporary storage of information that is being actively used or processed, and it has a limited capacity. Long-term memory is the more permanent storage of information, and it has a much larger capacity.

This model has been applied to the development of training programs for soldiers and pilots. For example, training programs may use repetition and practice to help move information from short-term to long-term memory, and they may also use mnemonic devices (such as acronyms or rhymes) to help students remember important information.

Another theory of memory that has had an impact on defence technologies is the concept of "working memory," which was proposed by psychologist Alan Baddeley in the 1970s. Working memory is the process of actively manipulating and using the information in short-term memory, and it is important in tasks such as problem-solving and decision-making. Baddeley's model of working memory suggests that it consists of several different components, including a central executive, a phonological loop, and a visuospatial sketchpad. The central executive is responsible for controlling and coordinating the other components, while the phonological loop is responsible for storing and manipulating verbal information, and the visuospatial sketchpad is responsible for storing and manipulating visual and spatial information.

Moving towards the Indian front, the Indian military places a strong emphasis on training and has developed a range of programs to ensure that its personnel are well-prepared for the challenges they may face. To improve the attention of its personnel, the Indian military has developed a range of training programs that focus on building mental resilience and the ability to stay focused under pressure. These programs often use techniques such as meditation, yoga, and cognitive-behavioural therapy to help soldiers and pilots improve their attention and focus.

Another area where cognitive psychology has had an impact on defence technologies in India is in the development of weapons systems that are designed to assist soldiers and pilots in making decisions. The Indian military has embraced the use of artificial intelligence (AI) in its weapons systems, and it has developed a range of systems that use AI to process vast amounts of data and provide recommendations or warnings to soldiers and pilots.

One example of this is the development of the Integrated Air Command and Control System (IACCS), which is a network of radars, sensors, and other systems that are used to track and identify threats in the air. The IACCS uses AI algorithms to process data from these systems and provide real-time warnings to pilots, helping them to stay aware of potential threats and make informed decisions.

The Indian military has also developed a range of systems that use AI to assist with tasks such as target identification and classification. These systems can help soldiers and pilots to quickly and accurately identify targets, which is crucial in fast-moving and high-stress situations.

In conclusion, cognitive psychology has had a significant impact on defence technologies in India, helping to understand how the human brain works and how people make decisions. This

has led to the development of effective weapons systems and training programs that are designed to assist soldiers and pilots in their tasks, and to improve their mental skills and abilities.

https://www.financialexpress.com/defence/sharpening-the-sword-the-role-of-cognitive-psychology-in-enhancing-indias-defence-capabilities/2936742/

WION

Wed, 04 Jan 2023

French Pesident's Diplomatic Advisor Bonne Travels to Delhi to take part in Indo-France Strategic Dialogue

India and France will hold the 36th strategic dialogue in Delhi on Thursday for which French President Emmanuel Macron's diplomatic advisor and G20/G7 Sherpa Emmanuel Bonne will be in the Indian capital. National Security Advisor (NSA) Ajit Doval will lead the Indian side having travelled to Paris in 2021 for the last iteration of the dialogue. The annual dialogue will focus on issues like Indo-Pacific, Afghanistan, G20, defence cooperation, counter-terrorism, and other issues.

Bonne is the first foreign official to travel to Delhi in 2023, a year that will see India host big-ticket summits like the G20 and SCO. The fact that he is also France's G20 sherpa means a key focus will be on the Indian presidency of the grouping. India as the president of the grouping will hold the summit later this year in September. In his day-long visit, Bonne is expected to meet other top officials as well. The 52 years old top French diplomat was in Delhi in 2021 and called on PM Modi.

The visit comes in a year when the French President is also expected to visit India and which marks the 25th anniversary of the Indo-French strategic partnership, launched in 1998. Defence cooperation, space cooperation and civil nuclear cooperation constitute the three principal pillars of the strategic partnership between the two countries. Ahead of the visit, both sides have also been discussing ways to speed up the setting up of the civilian nuclear power reactors at Jaitapur, Ratnagiri district of Maharashtra.

https://www.wionews.com/india-news/french-presidents-diplomatic-advisor-bonne-travels-to-delhi-to-take-part-in-indo-france-strategic-dialogue-549506

Hindustan Times

Wed, 04 Jan 2023

Prez Sisi's Visit: Defence, Green Energy in Focus in India-Egypt Cooperation

Defence and green energy have emerged as key areas of cooperation between India and Egypt ahead of Egyptian President Abdel Fattah El-Sisi's visit to the country as the chief guest at the Republic Day celebrations. Though the two countries have enjoyed close ties in past decades,

especially as founding members of the Non-Aligned Movement (NAM) in 1961, the 68-year-old general-turned-politician will be the first Egyptian leader to be hosted by India for the Republic Day.

The visit has been preceded by growing contacts in different spheres though it is defence and green energy, especially green hydrogen, that have seen the greatest progress, people familiar with the matter said. Bilateral trade too has grown, touching $7 billion in 2021-22, a 60% increase over the figure for 2020-21. India's home-grown Tejas combat jet is in contention, along with South Korea's FA-50 light attack jets, for Egypt's plans to acquire 70 light combat aircraft to replace its ageing fleet. Hindustan Aeronautics Limited (HAL) has offered to set up a production line in Egypt and transfer technology for the Tejas, the people said. HAL has also offered the Dhruv advanced light helicopter and its combat variant to Egypt, with an eye to using the country as a base for exports to other West Asian and African countries, they said.

During defence minister Rajnath Singh's visit to Egypt last September, the two sides signed a memorandum of understanding (MoU) to enhance bilateral defence cooperation. The two sides also agreed to enhance joint exercises and exchanges of personnel for training, especially in counter-insurgency. Singh and his Egyptian counterpart General Mohamed Zaki further agreed to identify specific proposals for expanding cooperation between the defence industries of the two sides. The issue of joint manufacturing of defence hardware, including the transfer and localisation of technology, also figured in Singh's meeting with the Egyptian president during the visit. Significant progress has also been made in recent months in the realm of green energy, with the Egyptian government signing a memorandum of understanding (MoU) with the Indian company Ocior Energy on December 7 last year to establish a green hydrogen project in Egypt.

On November 15, the Egyptian government signed another framework agreement with India's ReNew Power on the margins of COP27 in Sharm el-Shiekh to set up a green hydrogen plant in the Suez Canal Economic Zone with an investment of $8 billion. This facility is expected to have a targeted annual production of 220,000 tonnes of green hydrogen and derivatives.

Earlier, Egypt signed a MoU with India's Acme Group in August 2022 to build a green fuel plant at Sokhna with a planned investment of $13 billion to produce 2.2 billion tonnes of green hydrogen annually. The two sides have also been working to ramp up bilateral trade and investment to reach a target of $12 billion over the next five years. A growing number of Indian companies are eyeing opportunities in the Egyptian market, including renewable energy, pharmaceuticals, food production, logistics, engineering and transport. Indian businesses are also looking at Egypt as a gateway to European, West Asian and African market.

In April 2022, Egypt approved India as a certified wheat supplier and the first consignment of Indian wheat was shipped to the country the following month.The people said all of these initiatives are expected to get a fillip during Sisi's visit and during Egypt's participation as a guest country in the G20 under India's presidency.

https://www.hindustantimes.com/india-news/prez-sisi-s-visit-defence-green-energy-in-focus-in-india-egypt-cooperation-101672841874791.html

ARMY TECHNOLOGY

Wed, 04 Jan 2023

Rafael Introduces New Counter-TBM Capability for SPYDER System

Israel-based company Rafael has announced that its surface-to-air Python 5 and Derby (SPYDER) air defence missile system has been upgraded with new tactical capabilities. The combat-proven system now features a counter-tactical ballistic missiles (TBM) capability, which is part of the company's counter-TBM Spyder programme.

Rafael launched the programme based on its research, analysis, and lessons learnt from the ongoing armed conflicts that involved extensive use of various tactical ballistic missiles. Ready for implementation, the upgraded SPYDER system will also fulfil the growing and urgent operational requirements of Rafael's existing customers across the globe. As part of the programme, the company will extend the capabilities of SPYDER's effectors and execute the delivery of different counter-TBM derivatives for the existing air defence systems.

Rafael Air & Missile Defence Systems Division executive vice-president and general manager brigadier general (res.) Pinhas Yungman said: "We are proud to announce that our international sales leader, SPYDER, has been reinforced with a TBM defence capability. "This extremely important counter-TBM feature will be offered as an option in SPYDER's toolbox. Under SPYDER's tailor-made solution paradigm, this capability will be offered as a cost-effective option to our valuable customers with respective urgent operational needs."

According to Rafael, SPYDER is the only Israeli-made air defence system to be included in NATO's aerial defence array. This low-level, quick reaction, autonomous system is deployed to deter airborne attacks from helicopters, uncrewed aerial vehicles, precision-guided munitions, and other aircraft to protect forces on the battlefield. It is an open architecture platform that can support the easy and rapid integration of external components as per the requirements of the users. SPYDER can detect threats while moving and can conduct a 360° launch within seconds.

https://www.army-technology.com/news/rafael-counter-tbm-spyder/

INDIA TODAY

Thu, 05 Jan 2023

South Korea Prez Yoon Warns of Ending Military Pact After North Drone Intrusion

South Korean President Yoon Suk-yeol said on Wednesday he would consider suspending a 2018 inter-Korean military pact if the North violates its airspace again, his office said, amid tension over a recent intrusion by North Korean drones. Yoon made the comment after being briefed on countermeasures to North Korean drones that crossed into the South last week, calling for building an "overwhelming response capability that goes beyond proportional levels,"

according to his press secretary, Kim Eun-hye. "During the meeting, he instructed the national security office to consider suspending the validity of the military agreement if North Korea stages another provocation invading our territory," Kim told a briefing.

The 2018 deal, sealed on the sidelines of a summit between North Korean leader Kim Jong Un and South Korean President Moon Jae-in, calls for ceasing "all hostile acts", creating a no-fly zone around the border, and removing landmines and guard posts within the heavily fortified Demilitarised Zone. The government has not said how many mines and posts were removed, citing security concerns.

Abandoning the pact could mean the return of the guard posts, live-fire drills in the former no-fly zone and propaganda broadcasts across the border - all of which drew angry responses from Pyongyang before the pact. Inter-Korean relations have been testy for decades but have grown even more tense since Yoon took office in May pledging a tougher line against Pyongyang. During the election campaign last year, Yoon said Pyongyang had repeatedly breached the agreement with missile launches and warned he might scrap it. He said after taking office that the pact's fate hinges on the North's actions.

Yoon has criticised the military's handling of the drone incident, in part blaming the previous administration's reliance on the 2018 pact. He has urged the military to stand ready to retaliate, even if that means "risking escalation." Yoon ordered the defence minister to launch a comprehensive drone unit that performs multi-purpose missions, including surveillance, reconnaissance and electronic warfare, and to set up a system to mass-produce small drones that are difficult to detect within the year, Kim said. "He also called for accelerating the development of stealthy drones this year and quickly establishing a drone killer system," she said.

South Korea's army operated two drone squadrons within its Ground Operations Command since 2018, but they were primarily designed to prepare for future warfare. The defence ministry has said it plans to launch another unit focusing on surveillance and reconnaissance functions, especially targeting smaller drones. "The upcoming unit would carry entirely different tasks, conducting operations in various areas," Defence Minister Lee Jong-sup told parliament last week. To boost its anti-drone capability, the ministry announced plans last week it would spend 560 billion won ($440 million) over the next five years on technology such as airborne laser weapons and signal jammers.

https://www.indiatoday.in/amp/world/story/south-korea-prez-yoon-warns-ending-military-pact-after-north-drone-intrusion-2317456-2023-01-05

INDIA TODAY

Thu, 05 Jan 2023

Russian Prez Putin Deploys New Zircon Hypersonic Cruise Missiles to Atlantic

President Vladimir Putin sent a frigate to the Atlantic Ocean armed with new generation hypersonic cruise missiles on Wednesday, a signal to the West that Russia will not back down

over the war in Ukraine. Russia, China and the United States are in a race to develop hypersonic weapons which are seen as a way to gain an edge over any adversary because of their speeds - above five times the speed of sound - and manoeuvrability. In a video conference with Defence Minister Sergei Shoigu and Igor Krokhmal, commander of the frigate named "Admiral of the Fleet of the Soviet Union Gorshkov", Putin said the ship was armed with Zircon (Tsirkon) hypersonic weapons. "This time the ship is equipped with the latest hypersonic missile system - 'Zircon'," said Putin. "I am sure that such powerful weapons will reliably protect Russia from potential external threats."

The weapons, Putin said, had "no analogues in any country in the world". More than 10 months since Putin sent troops into Ukraine, there is no end in sight to the war which has descended into a grinding winter artillery battle that has killed and wounded tens of thousands of soldiers on both sides. Russia has also used hypersonic Kinzhal (Dagger) missiles in Ukraine.

Along with the Avangard hypersonic glide vehicle which entered combat duty in 2019, the Zircon forms the centrepiece of Russia's hypersonic arsenal. Russia sees the weapons as a way to pierce increasingly sophisticated U.S. missile defences which Putin has warned could one day shoot down Russian nuclear missiles.

ATLANTIC VOYAGE

Shoigu said the Gorshkov would sail to the Atlantic and Indian oceans and to the Mediterranean Sea. "This ship, armed with 'Zircons', is capable of delivering pinpoint and powerful strikes against the enemy at sea and on land," Shoigu said. Shoigu said the hypersonic missiles could overcome any missile defence system. The missiles fly at nine times the speed of sound and have a range of over 1,000 km, Shoigu said. The main tasks of the voyage were to counter threats to Russia and to maintain "regional peace and stability jointly with friendly countries", Shoigu said.

A U.S. Congressional Research Service report on hypersonic weapons says that Russian and Chinese hypersonic missiles are designed to be used with nuclear warheads. The target of a hypersonic weapon is much more difficult to calculate than for intercontinental ballistic missiles because of their manoeuvrability. Beyond Russia, the United States and China, a range of other countries are developing hypersonic weapons including Australia, France, Germany, South Korea, North Korea and Japan, according to the U.S. Congressional Research Service.

https://www.indiatoday.in/amp/world/story/putin-deploys-new-zircon-hypersonic-cruise-missiles-to-atlantic-2317459-2023-01-05

FINANCIAL EXPRESS
Read to Lead

Wed, 04 Jan 2023

Taiwan Strengthens Defence Capabilities with US Military Sales

The US has given the green light for the sale of the Volcano anti-tank mine-laying system to Taiwan for reportedly $180 million. Developed by the US Army in the 1980s, the Volcano system is capable of dispersing anti-tank and anti-personnel mines from either a ground vehicle

or helicopter and could be used to defend against amphibious landings on Taiwan's beaches. The sale also includes M977A4 HEMTT 10-ton cargo trucks, M87A1 anti-tank munitions, M88 canister training munitions, M89 training munitions, and logistics support packages, among other forms of assistance. The purpose of the sale is to enhance Taiwan's capacity for "asymmetric warfare" amid rising tensions with China, which claims Taiwan as its own territory and has vowed to take the island by force if necessary. Taiwan strongly rejects Beijing's sovereignty claim and has stated that it will defend itself in the event of an attack.

Sales could impact US-China Relations

Northrop Grumman and Oshkosh Corporation, manufacturers of the munitions and trucks respectively, are the prime contractors for the sale. The move has the potential to further increase tensions between the US and China. Why? Because China views Taiwan as part of its territory and strongly opposes any form of support or recognition of its independence by foreign governments. The US has unofficial ties with Taiwan, including robust defence exchanges and military sales, making it Taiwan's strongest international backer and main source of arms, which has angered China.

Taiwan's Asymmetric Warfare Strategy in Face of Chinese Threat

The Chinese Communist Party's (CCP) frequent military activities near Taiwan have posed severe threats to the self-ruled island and have intensified in recent years. In a 24-hour display of force, China's military sent 71 aircraft and seven ships towards Taiwan, with 47 of the planes crossing the median line of the 160-kilometre (99-mile) Taiwan Strait, an unofficial boundary previously recognized by both sides, according to Taiwan's Defense Ministry.

The sale of the Volcano anti-tank mine-laying system and other military equipment to Taiwan by the US has the potential to increase tensions between the two countries. China views Taiwan as part of its territory and strongly opposes any form of support or recognition of Taiwan's independence by foreign governments. The US is Taiwan's strongest international backer and main source of arms, a move that angers China.

Tensions between both the US and China spiked earlier this year after US Speaker Nancy Pelosi visited Taiwan despite China's opposition to the trip. Beijing views visits from foreign governments to the island as de facto recognition of Taiwan's independence and a challenge to China's sovereignty claim.

In its announcement of the military sales, the US stated that the sale of the Volcano system to Taiwan serves its national, economic, and security interests by supporting the recipient's efforts to modernise its armed forces and maintain a credible defensive capability. The sale is intended to help the island nation strengthen its defence capabilities in the face of increasing military threats from China.

Analysts also call for Taiwan to invest in traditional, "big-ticket" items such as advanced fighter jets to defend its airspace and deter potential Chinese military aggression. Ultimately, the best approach for Taiwan will likely involve a mix of asymmetric and traditional defence capabilities tailored to the specific threats it faces and its resources. The situation in the Taiwan Strait is complex and tensions between China and Taiwan, as well as between China and the US, have the potential to escalate.

https://www.financialexpress.com/defence/taiwan-strengthens-defence-capabilities-with-us-military-sales/2936523/

The Guardian

Wed, 04 Jan 2023

Australian Defence Force to Spend $1bn Acquiring Naval Strike Missiles and Army Rocket Systems

Australia will spend more than $1bn on new naval missiles and acquiring a US rocket artillery system used by the Ukrainian military. The defence industry minister, Pat Conroy, said the acquisition of 20 high mobility artillery rocket systems (Himars) including launchers, missiles and training rockets, from the US defence contractor Lockheed Martin was the "largest expansion of army strike capability in living memory", reflecting the need to deter threats in a time of "strategic uncertainty".

Defence has also signed a contract with the Norwegian firm Kongsberg to provide naval strike missiles, replacing the ageing Harpoon anti-ship missiles on Hobart-class destroyers and Anzac-class frigates from 2024. The number of missiles ordered is classified. Defence will additionally acquire a weapon-locating radar system from the Australian company CEA.

The Himars will be in service by 2026-27, increasing the range of Australian army strike weapons from the current 30km to 50km to up to 300km, with further advances in the precision strike missile achieving a range of more than 499km.

Acquisition of the naval strike missiles was flagged by the Morrison government in April as part of $3.5bn in spending but Conroy said the Albanese government had "sped up the acquisition cycle for both" naval missiles and Himars. "If we – for Himars – had stuck with the former government's plans, we would've lost our place in the production queue due to huge global demand." The defence minister, Richard Marles, said: "In the current strategic environment, it's important the Australian Defence Force is equipped with high-end, targeted military capabilities." Marles said Labor was taking "a proactive approach to keeping Australia safe" and the acquisitions "will give our defence force the ability to deter conflict and protect our interests".

Conroy said the technology involved in the acquisitions "takes our forces to the cutting edge of modern military hardware". "The naval strike missile is a major step up in capability for our navy's warships, while Himars launchers have been successfully deployed by the Ukrainian military over recent months and are a substantial new capability for the army."

The chief of the Australian defence force, Gen Angus Campbell, has warned that "across our region, large-scale military modernisation is accelerating", in a clear reference to China, and the US has increased rotations of its forces to Australia while condemning China's "dangerous and coercive actions" across the Indo-Pacific.

Conroy said that he "won't comment about specific countries but I will say, we've been very open about the fact that we face the greatest strategic uncertainty since World War II". In November Marles told the Sydney Institute that Australia's defence capabilities "cannot match those of major powers" but the country needed "to project force and power, to deter military threats and defend Australia's national interests within our immediate region".

Marles said Australia would need to achieve “impactful projection” and “strengthen the lethality, resilience and readiness of the ADF”. “We must invest in targeted capabilities that enable us to hold potential adversaries’ forces at risk at a distance and increase the calculated cost of aggression against Australia and its interests.” In October Conroy suggested the government was developing a plan with defence companies Lockheed Martin and Raytheon to develop a sovereign missile manufacturing industry. “Lockheed Martin is a strategic partner, they make Himars and missiles and rockets associated with that … so we’re exploring options for possible local manufacture of the rockets or missiles Himars would fire,” Conroy said. He also said the government was “exploring options for possible greater local content in the naval strike missile”.

https://www.theguardian.com/australia-news/2023/jan/05/australian-defence-force-to-spend-1bn-acquiring-naval-strike-missiles-and-army-rocket-systems

the pioneer

Thu, 05 Jan 2023

Poland Signs Deal to Buy 2nd Batch of US Abrams Tanks

Poland's defence minister on Wednesday signed a deal to buy a second batch of US Abrams main battle tanks as Warsaw beefs up its defensive capabilities and strengthens military cooperation with Washington in light of Russia's war in neighbouring Ukraine. Officials said Poland is the first US ally in Europe to be receiving Abrams tanks.

Defence Minister Mariusz Blaszczak signed the USD 1.4 billion deal at a military base in Wesola, near Warsaw. The agreement foresees the delivery of 116 M1A1 Abrams tanks with related equipment and logistics starting this year. "We are strengthening Poland's armed forces, we are strengthening the iron fist of the Polish army in order to increase the power to deter the aggressor," said Blaszczak, who is also a deputy prime minister.

He said cooperation between Poland and the US is strengthening the security of the entire region and especially of the eastern flank of NATO. Attending the signing ceremony were US deputy chief of mission in Poland Daniel Lawton and US Brig. Gen. John Lubas, deputy commander of the 101st Airborne Division, elements of which are stationed in southeastern Poland close to the border with Ukraine.

https://www.dailypioneer.com/2023/world/poland-signs-deal-to-buy-2nd-batch-of-us-abrams-tanks.html

THE HINDU

Wed, 04 Jan 2023

Japan's PM Kishida Vows Deeper Alliance with U.S. on Defense

Japanese Prime Minister Fumio Kishida on Wednesday pledged to deepen his country's alliance with the United States under Japan's new defense policy that breaks from its exclusively self-defense-only stance in the face of growing regional tensions.

Mr. Kishida, speaking in a news conference after visiting Ise Shrine in central Japan, said he will visit Washington for talks with President Joe Biden to underscore the strength of the Japan-U.S. alliance and highlight closer cooperation between the countries under Japan's new security and defense strategies adopted last month.

The U.S. visit is part of Mr. Kishida's upcoming trip to most of the Group of Seven countries beginning Monday. Japan will host this year's G-7 summit in Hiroshima. Mr. Kishida said his meeting with Biden will be “very important" and "more significant than showing my face as G-7 president.” “We will show to the rest of the world an even stronger Japan-U.S. alliance, which is a lynchpin of Japanese security and diplomacy,” Mr. Kishida said. “We will also show our further cooperation toward achieving a ‘free and open Indo-Pacific.’”

Japan, under the new security and defense plans, is purchasing hundreds of U.S.-developed Tomahawks and other long-range cruise missiles to preempt possible attacks and also building up defenses in southwestern Japan amid growing worries of a Taiwan emergency. Japanese media said the U.S. and Japan are expected to discuss how they would cooperate in the event of a conflict over Taiwan.

Earlier Wednesday, the White House announced that Biden will host Mr. Kishida for economic and security consultations on Jan. 13. Mr. Biden and Mr. Kishida are expected to discuss North Korea’s nuclear and ballistic missile programs, amid concerns over the potential for another nuclear test by the reclusive nation, as well as Russia’s invasion of Ukraine, stability across the Taiwan Strait, climate change and economic issues, White House press secretary Karine Jean-Pierre said. The two leaders last met in Bali, Indonesia, during November’s Group of 20 summit.

Mr. Kishida will also visit France, Italy, Britain and Canada to meet their leaders during his Jan. 9-15 trip, according to Japan's Foreign Ministry. Mr. Kishida on Wednesday also vowed to tackle Japan's dire problem of declining births, while pushing his “new capitalism” policy that he said will generate a “virtuous cycle of growth and distribution of wealth” to achieve a steady increase in salaries that have stalled for decades. The number of babies born in Japan last year is expected to fall to a new record below 800,000 as part of a steady decline that is seen as eroding national strength. “We cannot wait any longer,” Mr. Kishida said. “From an economic perspective, we also need to allay the concerns of those saying they cannot invest in Japan because it's shrinking from declining births.”

Mr. Kishida said the government will do more to expand support for childcare and reduce gender gaps in salaries and working environments to lower barriers for women. Japan is the world’s third-biggest economy but living costs are high and wage increases have been slow. The conservative government has lagged in making society more inclusive for children, women and minorities. So far, the government’s efforts to encourage people to have more babies has had limited impact despite introducing subsidy payments for pregnancy, childbirth and child care.

https://www.thehindu.com/news/international/japans-pm-kishida-vows-deeper-alliance-with-us-on-defense/article66339187.ece

Press Information Bureau
Government of India

Ministry of Science & Technology

Wed, 04 Jan 2023

Science Leaders Discuss India's Path toward a Knowledge Intense Economy

Leaders of scientific departments of the Government of India chalked out the framework for making India a knowledge intense economy and deliberated on the challenges and opportunities in the path at the first plenary session of the Indian science congress at Nagpur.

Principal Scientific Adviser to the Government of India, Professor A K Sood underlined that while India has emerged as the third largest ecosystem for start-ups globally and the deep tech startup landscape in India has seen rapid growth, there is still space to boost it up specifically in areas like consumer technology, automotive, media and entertainment, agritech, energy utilities, and cyber security. He added that convergence of technological revolutions in quantum science and technology, advanced communication technologies, clean energy, digital transformation, and one health mission is fuelling India's progress towards a global knowledge intense economy. "Science will play a crucial role in India's transformation, and this transformation will be grounded in our labs. So it is the responsibility of us scientists to think how relevant our science will be to face future challenges. We have to frame our questions to address future problems, be it in manufacturing or sustainability issues," said Dr. S Chandrasekhar, Secretary Department of Science and Technology (DST). He underlined that science needs to imagine future factories and design manufacturing methods that suit them, match input with output so that waste is minimised, develop the concept of circular science, generate agricultural technologies that can obviate the necessity of subsidies, and find alternate mobility options that are less polluting.

Dr. Chandrasekhar highlighted the necessity of developing the grassroot--global connect so that solutions from the grassroots can give clues to solve global problems. Stressing on the need for sustainability in successful scientific solutions, N. Kalaiselvi, Director General CSIR, outlined India's challenges and opportunities in some areas like the environment and climate change, energy and mobility, food and nutrition, industry 4.0/5.0, ease of doing science and attracting and retaining talent which are critical to India in the next seven years. She said these will lay the foundation for the next 17 years to make India a developed country. Dr. Alka Sharma, Senior Advisor Department of Biotechnology (DBT), emphasised on bio-manufacturing—manufacturing that uses biological systems replacing fossil fuel-derived chemicals, as the new wave of industrialisation. She added that it could lock atmospheric carbon in its stable form, paving the pathway that would make India a country leading the world in sustainability.

https://pib.gov.in/PressReleasePage.aspx?PRID=1888529

Press Information Bureau
Government of India

Ministry of New and Renewable Energy

Wed, 04 Jan 2023

Cabinet Approves National Green Hydrogen Mission

Mission aims to make India a Global Hub for production, utilization and export of Green Hydrogen and its derivatives

Mission will help in India becoming energy independent and in Decarbonisation of major sectors of the economy

The Union Cabinet, chaired by the Hon'ble Prime Minister Shri Narendra Modi, has approved National Green Hydrogen Mission. The initial outlay for the Mission will be Rs.19,744 crore, including an outlay of Rs.17,490 crore for the SIGHT programme, Rs.1,466 crore for pilot projects, Rs.400 crore for R&D, and Rs. 388 crore towards other Mission components. MNRE will formulate the scheme guidelines for implementation of the respective components.

The Mission will result in the following likely outcomes by 2030:

Development of green hydrogen production capacity of at least 5 MMT (Million Metric Tonne) per annum with an associated renewable energy capacity addition of about 125 GW in the country

Over Rs. Eight lakh crore in total investments

Creation of over Six lakh jobs

Cumulative reduction in fossil fuel imports over Rs. One lakh crore

Abatement of nearly 50 MMT of annual greenhouse gas emissions

The Mission will have wide ranging benefits- creation of export opportunities for Green Hydrogen and its derivatives; Decarbonisation of industrial, mobility and energy sectors; reduction in dependence on imported fossil fuels and feedstock; development of indigenous manufacturing capabilities; creation of employment opportunities; and development of cutting-edge technologies. India's Green Hydrogen production capacity is likely to reach at least 5 MMT per annum, with an associated renewable energy capacity addition of about 125 GW. The targets by 2030 are likely to bring in over Rs. 8 lakh crore investments and create over 6 lakh jobs. Nearly 50 MMT per annum of CO2 emissions are expected to be averted by 2030.

The Mission will facilitate demand creation, production, utilization and export of Green Hydrogen. Under the Strategic Interventions for Green Hydrogen Transition Programme (SIGHT), two distinct financial incentive mechanisms – targeting domestic manufacturing of electrolysers and production of Green Hydrogen – will be provided under the Mission. The Mission will also support pilot projects in emerging end-use sectors and production pathways. Regions capable of supporting large scale production and/or utilization of Hydrogen will be identified and developed as Green Hydrogen Hubs.

An enabling policy framework will be developed to support establishment of Green Hydrogen ecosystem. A robust Standards and Regulations framework will be also developed. Further, a public-private partnership framework for R&D (Strategic Hydrogen Innovation Partnership – SHIP) will be facilitated under the Mission; R&D projects will be goal-oriented, time bound, and suitably scaled up to develop globally competitive technologies. A coordinated skill development programme will also be undertaken under the Mission.

All concerned Ministries, Departments, agencies and institutions of the Central and State Governments will undertake focussed and coordinated steps to ensure successful achievement of the Mission objectives. Ministry of New & Renewable Energy will be responsible for overall coordination and implementation of the Mission.

https://pib.gov.in/PressReleasePage.aspx?PRID=1888547

ThePrint

Wed, 04 Jan 2023

Gaganyaan Delayed as ISRO Developing In-house Life Support for Astronauts, says Agency Chief

India's first manned mission to space, Gaganyaan, has been delayed because ISRO is developing environmental control and life support for astronauts, after it found the cost of importing these components prohibitive, the agency chairman S Somanath said Wednesday, on the sidelines of the Indian Science Congress.

The ongoing science congress, being held at the Rashtrasant Tukadoji Maharaj Nagpur University, was virtually inaugurated by Prime Minister Narendra Modi Tuesday. Several dignitaries. including Union ministers Jitendra Singh and Nitin Gadkari, Maharashtra Chief Minister Eknath Shinde, and Deputy CM, Devendra Fadnavis, also attended the event.

The theme of the congress is "Science and Technology for Sustainable Development with Women Empowerment". During an interaction with the media, Somanath talked about whythe launch of Gaganyaan was delayed. The spacecraft, designed to carry up to three astronauts, will orbit the Earth at 400 km altitude for up to seven days. India's first crewed mission was originally planned to be launched in December 2021, but since then has been delayed to no earlier than 2024. "I have made it very clear that we do not want to take any chances with humans up there," he said.

The mission will take place but we are being very cautious about it, he underlined. "World over, human space missions do not take place overnight. They take years to develop, typically 10 years. We took the task to develop it in four years." "We realised that it is likely to take more years primarily because our industrial ecosystem is not mature," the ISRO chief said.

Somanath also explained that the initial plan was to import some technologies from abroad, such as Russia and Europe, but they were not easily available. "We have to do most of these ourselves now. For example, the environmental control and life support system. It is coming at an exorbitant cost. So we decided that we will do it in-house."

ISRO has also introduced four additional test abort levels, so that if anything goes wrong the crew is able to abort the mission. “We are going to demonstrate that starting from this year. Two abort missions are planned this year along with an unmanned mission. The remaining two abort missions will take place next year, followed by another unmanned mission.” If all of these are successful, we will go ahead with the human spaceflight mission, Somanath said. The first abort mission is scheduled for April or May this year.

Meanwhile, India’s next mission to the moon is also ready to launch between June and July, Somanath said, which he added is the nearest available window for the take off. He added the mission objectives were similar to that of Chandrayaan-2. ISRO is already working on defining the science goals for the next Mars mission. Similarly for Venus, Somanath said that the mission teams are working on defining the objectives.

https://theprint.in/science/gaganyaan-delayed-as-isro-developing-in-house-life-support-for-astronauts-says-agency-chief/1297858/

THE ECONOMIC TIMES

Wed, 04 Jan 2023

ISRO Planning Second Development SSLV Flight Next Month

The Indian Space Research Organisation is set to test a space-based aircraft monitoring system when it undertakes a development flight of Small Satellite Launch Vehicle (SSLV) in February, according to senior officials. The SSLV, aimed at launching up to 500 kg satellites in planar orbit, was unsuccessful in its first development flight on August 7 last year. If successful, the flight will allow ISRO to provide an on-demand satellite launch system. "I cannot give you a specific date, but we are planning a test flight next month," ISRO chairman S Somanath told reporters on the sidelines of the 108th Indian Science Congress.

He said India was also planning scientific missions to Mars and Venus besides attempting a land rover to the moon sometime this year. "The Chandrayaan-3 spacecraft is almost ready. The orbiter, lander and rover. But we are waiting for the right time to launch the mission, which is sometime in June. We will try to meet that launch window," Somanath said.

A senior ISRO official said the space agency will also test the satellite-based Automatic Dependent Surveillance-Broadcast (ADS-B) receiver system onboard the SSLV next month. "The ADS-B receiver gets all details of an aircraft. Currently, the Air Traffic Controller gets these signals. But there are certain blind spots -- about 30 per cent of airspace across the globe -- where ATC doesn't have access. Now, we have developed a space-based ADS-B technology," D K Singh, Deputy Director, Advanced Technology Area, Space Application Centre, Ahmedabad, told PTI.

https://economictimes.indiatimes.com/news/science/isro-planning-second-development-sslv-flight-next-month/articleshow/96741804.cms

Hindustan Times

Thu, 05 Jan 2023

Neelesh Mehta Wins GD Birla Award for Scientific Research

Professor Neelesh B Mehta has been selected for the 32nd GD Birla Award for Scientific Research in recognition of his outstanding contribution to the field of wireless communications, the KK Birla Foundation said in an official statement on Wednesday.

Instituted in 1991, the award recognises eminent Indian scientists below the age of 50 for their original and outstanding contributions to any branch of science. It carries a cash prize of ₹5 lakh. The recipient is chosen by a selection board consisting of top scientists from different centres.

Mehta, a member of the faculty at the Indian Institute of Science (IISc), graduated from the Indian Institute of Technology, Madras, with a degree in electronics and communications engineering in 1996. He went on to get a Master's and PhD from the California Institute of Technology. Through his research, Mehta has made significant contributions to the design, modelling, analysis, and optimisation of current and next-generation wireless communication systems, with a focus on green energy harvesting wireless networks, opportunistic selection, spectrum sharing, and new analytical tools for characterising the performance of 4G and 5G systems.

Mehta's research group at the IISc is pursuing several technologies relevant to 5G and those beyond cellular communication systems, which target a new and diverse set of applications, and next-generation wireless local area networks. His group is working on interference-aware resource allocation algorithms for emerging technologies such as full-duplex communications, underlay spectrum sharing, and device-to-device communications with an aim to improve spectral efficiency and reduce the latency of wireless systems.

A fellow at the Indian National Science Academy (INSA), Indian National Academy of Engineering (INAE), National Academy of Sciences India (NASI), and Institute of Electrical and Electronics Engineers (IEEE), Mehta has also been a recipient of IIT-Roorkee's Khosla National Award in Engineering and the Shanti Swarup Bhatnagar Award, among others.

https://www.hindustantimes.com/cities/delhi-news/neelesh-mehta-wins-gd-birla-award-for-scientific-research-101672857265261.html