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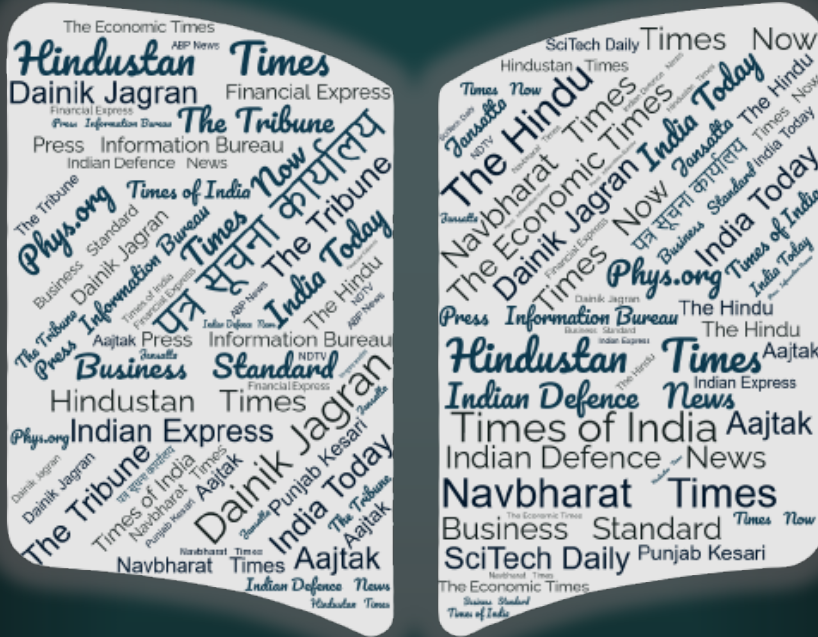
A Daily service to keep DRDO Fraternity abreast with DRDO
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DRDO News

DRDO Technology News



Tue, 13 Dec 2022

34 Start-Ups Awarded under Dare to Dream Scheme of DRDO in Last 3 Years

A total of 52 individuals and 34 start-ups have been awarded under three Dare to Dream contests of DRDO in last three years, said Raksha Rajya Mantri Ajay Bhatt in a written reply to Rajya Sabha on Monday. “A total of 5,637 applications have been received under the three Contests to promote individual and start-ups for innovation in the area of Defence and Aerospace in last three years. Around 7 projects have been sanctioned and awarded to start-ups of Dare to Dream contest winners so far,” he said.

DRDO has been launching Dare to Dream Contest every year since 2019 to bring together innovators, entrepreneurs, individuals above 18 years and start-ups (recognised by DPIIT and with Indian founders) for innovative ideas in the field of Defence and Aerospace. The selection criteria for evaluation of the entries are completeness of proposal, scientific soundness, design completeness, merit, technological readiness level achieved and innovation. The selected individual/company are getting benefitted as DRDO supports them to realise awarded ideas into Prototype through Technology Development Fund (TDF) scheme.

<https://knnindia.co.in/news/newsdetails/sectors/start-up/34-start-ups-awarded-under-dare-to-dream-scheme-of-drdo-in-last-3-years>

DRDO on Twitter



Defence News

Defence Strategic : National/International



Tue, 13 Dec 2022

Atmanirbharta in Defence: Know About the Major Indigenisation Initiatives

India's Defence sector is witnessing a significant wave of indigenisation as a part of Atmanirbhar Bharat and Make In India initiatives. The government of India has rolled out several policies to encourage and motivate self-reliance in defence manufacturing and technology in the country. Following the Make In India initiative, the country has been able to shift from being a Defence importer to an exporter. In a new feat, India's defence export stood at a record Rs

14,000 and the Government is now aiming to achieve Rs 25,000 crores worth of exports by 2025. Defence Minister Rajnath Singh recently revealed that issuance of positive indigenisation lists of over 3,700 items including components/Line Replacement Units for DPSUs and 310 other defence-related items have been issued by the Ministry of Defence to promote self-reliance.

Some of the major initiatives that are pushing indigenisation of India's defence sector include the launch of Mission DefSpace, the launch of Innovations for Defence Excellence (iDEX) scheme involving start-ups & Micro, Small and Medium Enterprises (MSMEs), the indigenisation portal SRIJAN and more.

Mission DefSpace

India's Space Defence initiative, Mission DefSpace was launched by Prime Minister Narendra Modi during DefExpo in October 2022. The goal of the space programme is to use industry and startups to further India's preparation and position the nation for potential future space opportunities. Mission DefSpace was launched with 75 Defence Space Challenges that have been categorised into existing DDP initiatives of iDEX, Make-I and Make-2. The challenges, grouped into five categories—Launch System, Satellite System, Communication & Payload System, Ground System, and Software System—provide a comprehensive 360° overview of space.

The budget allocation to this particular space sector is growing every year. Mentioning the budget allocation for the year 2022 – the Department of Space has been allocated a whopping Rs 13,700 crores in the annual budget, Rs 7,456.60 crores of which is earmarked for capital expenditure.

Innovations for Defence Excellence (iDEX)

The government introduced the Innovations for Defence Excellence (iDEX) framework with the goal of fostering innovation and technology development in the defence and aerospace sector by involving industries such as MSMEs, start-ups, individual innovators, R&D institutes, and academia and encouraging self-reliance. With budgetary support of Rs 498.78 crore for the following five years, from 2021–2022 to 2025–2026, the government has approved a central sector scheme for iDEX. Through Defense Innovation Organization, the program's goal is to financially support about 300 startups, MSMEs, and individual innovators (DIO).

SRIJAN

SRIJAN Portal of Department of Defence Production, Ministry of Defence was launched by Defence Minister Rajnath Singh in 2020. The portal is a one stop online portal that provides access to the vendors to take up items that can be taken up for indigenization. The portal presents data in a structured manner, including the name of the item, an image and specification, import values, a NATO Classification (indicative), etc. There is a search function as well.

Defence Industrial Corridors

To achieve self-reliance in the Defence sector in line with Make In India initiative, the Centre has developed two Defence Industrial Corridors (DICs)- one in Uttar Pradesh and the other in Tamil Nadu. Through these DICs, the government wants to create a defence manufacturing ecosystem with favourable conditions. The intention is to have a strong supply chain for boosting production and testing and certification to foster economies of scale and the growth of globally competitive businesses in the nation. According to MoD's data from July this year, Uttar Pradesh

Expressways Industrial Development Authority (UPEIDA), the nodal agency for Uttar Pradesh Defence Industrial Corridor (UPDIC) had signed 69 Memorandum of Understanding (MoUs) with industry with a potential investment of Rs 10,545 crore.

All the major sectors of the domestic defence production ecosystem have benefited from the initiatives, which place a strong emphasis on indigenization and procurement from domestic businesses. The initiatives have also sped up the development of domestic businesses, including MSMEs and start-ups.

<https://newsonair.com/2022/12/13/atmanirbharta-in-defence-know-about-the-major-indigenisation-initiatives/>



Tue, 13 Dec 2022

Indigenization- Steps towards Holistic Development

By Ajay Bedi

The Indian Ministry of Defence is focusing on indigenization and aggressively endeavouring in that direction by encouraging all stakeholders to devise strategies to promote “Make in India ” aspects. The latest success in this area is the tie-up between TATA’s and Airbus to produce the C-295 logistic aircraft indigenously, 16 will come as “Fly-in” and 40 odds will be produced / assembled here in India. In the last one decade we witnessed similar initiatives, which were endorsed as a new foundation or vaunt for this closely guarded defence and aviation sector of India. However, it didn’t expand the industry in the manner as it was depicted while propagating these initiatives. The reason being it caters to the interest of few renowned industry players and provides a miniscule opportunity for the medium and small-scale (MSMEs) industry of this sector. The production capabilities and the research and development standards are the evaluation criteria of any industry particularly when a nation is on the path of self-reliance.

India encounters the inherent issues like any other developing nation, e.g., national security, insurgency, people welfare, infrastructure development and other pertinent governance issues. Safety and security of the nation takes precedence upon all the matters stated above. Every nation strives to get the best of technology, equipment, or systems to safeguard itself from the external enemy as well as the insurgents within the country. Technology plays a crucial role in all the sectors, but it is a protagonist in the eternally evolving defence and aerospace sector. Countries aspire to possess the best of the technology and systems available to ensure its safety and security. Acquiring the latest arsenals or finest equipment with state-of-the-art technology is a simple stage, whereas the optimum usage and upkeep becomes a tedious, cumbersome, and financially exorbitant exercise. The dominance of the Original Equipment manufacturer -OEM is such that they have put stringent controls in the support mechanism and restricted the entry of any new or other company which is duly qualified and even interested in supporting these products. The OEMs are offering the support package with the initial sale of the product and by doing so they control the after-sale service, training, support etc... The buyers are left with no other option than getting the support of the Original Equipment manufacturer -OEM, who

provide the essential support mechanism at their own terms. The OEMs' clout or the undue advantage which they get after selling the product is damaging the balance of the sector particularly in the developing countries like India.

This uncharacteristic aspect of the OEMs and bigger organisations was recognised by the western world or the developed nations. To counter it, they devised a level playing field for all the players irrespective of their stature including the OEMs, which facilitated in developing an eco-system for the all-inclusive growth of this critical sector. Ensuring equal opportunity for all the vendors registered under the closely guarded defence and aerospace programme. Unbiased access to all the participants towards the information, designs and documentation which is imperative for fair competition, without any favourable treatment to the bigger organisation and OEMs augur expeditious growth. USA realised it way back and devised a strategy to "consolidate" its resources and eradicate "duplicity".

In the year 1972 DOD established the Defense Regional Interservice Support program to study the work conducted in different bases of the DOD, it further evolved as Joint Interservice Resource Study Groups-JIRSG in year 1978, to enhance the productivity of the armed force bases in economical manner without deterring the fleet maintenance and war preparedness. The further evolution of JIRSG shifted its focus from "Resources" to "Support", they further dwelled on creating a "Interservice" support mechanism, through various intra-military support agreements which did help in augmenting the war preparedness and improved its impact in other crucial areas of military management. By 1995 USDOD had 55 JIRSG regions, including bases at the neighbouring and at foreign land.

Further to the above the US administration introduced recommendations of "National Performance Group" which are the outcome of two study's May 1995 Roles and Missions study, and the October 1995 Defense Science Board study on Quality of Life. In 1996 Defense authorization legislation encouraged DOD to look to the private sector to meet its support needs, Activities that were not dependent on specialized, defense-unique equipment such as base security, facilities maintenance, and installation management services, were designated as prime candidates for early outsourcing. According to the roles and missions report, most of these non specialized or defense-unique services have little direct association with combat forces and can be moved to private-sector markets where competition ensures adequate cost control. The Roles and Missions' report also stated that the many routines, nonmilitary infrastructure functions associated with managing a military base were better left to the private sector to manage.

The above initiatives have gone through varied impediments and hiccups, but it didn't lose its directions because the DOD authorities were focused and resilient in their pursuit of holistically integrated growth of the industry viz a viz of the nation. The involvement of private industry in the military areas is expanded further to the extent of management of fleet and product support, which helped the respective unit of the armed forces to concentrate at their core competence. The self-reliant vision started in the 70's and chased diligently for three decades, which resulted in exponential development of the aerospace and defence industry, now US companies are in commanding position worldwide and are the leaders or the trend-setters internationally. The same applies to the European aerospace industry, where the respective countries have broken the barriers and are competing with the US companies at par. Russia was a force itself in the sector, but disintegration of the erstwhile Soviet Union-USSR has had its toll on the Russian dominance in the defence and aerospace industry globally. But Russia has emerged stronger in the last one

decade and is slowly seizing the lost ground in this sector, by regrouping its industry and by providing a reliable support structure for its customers and partners.

India recognised the importance of interdependence and jointness of various units of military and its related areas. The newly constituted department “Department of Military Affairs-DMA, is mandated with the task to ensure the enhancement of the Indian military in all aspects. One of its main objectives is to devise and apply methods, strategies to increase the effectiveness, war preparedness and cohesion between all the military divisions, which will drastically improve the quality of the work culture, optimal utilisation of allocated funds by increasing the resource sharing, fluid exchange of information, interdependencies without conflict of intra-military ranks.

India is indeed embarked on the same trend and will achieve the desired results provided they keep on their efforts diligently and try small steps towards indigenisation by adopting a hybrid model in support and maintenance of its inventory. They need to seek the support of the OEMs authorised MROs or the companies from abroad, which are looking for the opportunity and are well placed and qualified to provide the services without impacting the quality or diluting the operational effectiveness of the fleet. India is required to adopt a strategy to create an avenue for augmenting the defence and aerospace industry towards self-reliance by involving the foreign organisation/ MRO to spruce up the support and maintenance system in a comprehensive manner. The foreign vendors or companies need an ecosystem which ensures a market with humongous long-term potential without great investment. Whereas the current policy of indigenisation involves the investments whether by adopting “Strategic Partner-SP” or “Joint Venture-JV” Structure etc., however the Indian market in the sector is at nascent stage, which doesn't offer the desired returns in proportion to the investment involves, this keeps the investor at bay and the same is the big impairment for this sector growth. We must overcome this impediment.

Allow foreign organisations to utilise the existing infrastructure of our bases and further develop its substructure by creating their set-up here, emphasis should be on acquiring the technology, know-how and learning the support and maintenance craft and its nuances. Encourage the participation of the local industry (MSME/ SMEs), or some related public sector unit-PSUs by intermediary parts/components manufacturing and production. The focus should be to have an infrastructure like a repair hub which could cater to multiple brand products, but in a specific field like engines, airframes, avionics, common components, and assemblies.

This will permit these specialised defence and aerospace repair centres (Bases) to cater to the private industry like commercial and business airlines, to generate the required revenue stream to make it a profitable venture. Gradually encouraged the private participation and sanctioned them the limited access to the bases to conduct repair, maintenance, and other related works for their private clients. By doing so we would create an ecosystem to support the growth of our defence and aerospace industry in exhaustive manner. The participation of the foreign vendor will ensure latest technology dissemination and its involvement in our industry, by technology intervention, standards and work culture of our defence and aerospace industry will get the required boost and will help them in creating a product of international reckoning in all aspects. This gradually will pave the way for our industry growth and expansion. A well-guarded tripartite agreement between foreign vendors, Indian military bases and Indian MSME (Private sector), will do justice to the indigenisation in a holistic manner without much investment. The direction is set;

one requires treading the road of obstacles with utmost grit and concerted efforts to achieve the set goal.

<https://www.financialexpress.com/defence/indigenization-steps-towards-holistic-development/2911020/>



Tue, 13 Dec 2022

India-China Troops Clash: Defence Minister Rajnath Singh Holds Meeting with CDS, Services Chiefs in Delhi

Chief of Defence Staff General Anil Chauhan, Services Chiefs, on Tuesday, met with Defence Minister Rajnath Singh on the security situation along the Line of Actual Control with China at his residence in Delhi. The crucial meeting came nearly three days following a clash between Indian and Chinese troops in the Tawang sector of Arunachal Pradesh. According to the latest development, Singh, while speaking in the Parliament, said there were no Indian soldiers killed or severely injured in the clash. Furthermore, he assured the House that not a single inch of land was encroached on in Arunachal Pradesh and added the "Indian Army is capable to defend its sovereignty and territorial integrity".

What the Indian Army said

"On December 9, PLA troops contacted the LAC in Tawang Sector which was contested by own (Indian) troops in a firm and resolute manner. This face-off led to minor injuries to few personnel from both sides," the Indian Army said in a statement. "Both sides immediately disengaged from the area. As a follow up of the incident, own (Indian) commander in the area held a flag meeting with his counterpart to discuss the issue in accordance with structured mechanisms to restore peace and tranquillity," it said. 'Much more' injures on PLA side, says Arunachal MP Tapir Gao. Ruling Bharatiya Janta Party (BJP) MP from Arunachal-East, Tapir Gao on Monday said he heard that some injuries were reported on the Indian side but China's People's Liberation Army (PLA) suffered much more.

"...I heard that a few injuries were reported on the Indian side but PLA suffered much more injuries...Indian soldiers at the border won't budge even an inch...The incident is condemnable..." news agency ANI reported quoting Tapir Gao as saying.

<https://www.indiatvnews.com/amp/news/india/defence-minister-rajnath-singh-holds-meeting-with-cds-chauhan-on-recent-clash-between-indian-chinese-troops-in-twang-arunachal-pradesh-galwan-2022-12-13-830809>

India-China LAC Clash: Army can Tackle Transgressions, Rajnath Tells Parliament

Defence minister Rajnath Singh on Tuesday told Parliament that Indian Army bravely prevented the Chinese army from transgressing into the Indian territory in Arunachal Pradesh's Tawang, and compelled them to return to their posts. In a statement in both houses, Singh said that on 9 December, "PLA troops tried to transgress the LAC in the Yangtse area of Tawang Sector and unilaterally change the status quo."

"The Chinese attempt was contested by our troops in a firm and resolute manner. The ensuing face off led to a physical scuffle in which the Indian Army bravely prevented the PLA from transgressing into our territory and compelled them to return to their posts. The scuffle led to injuries to a few personnel on both sides. I wish to share with this House that there are no fatalities or serious casualties on our side," he said. "Due to the timely intervention of Indian commanders, PLA soldiers went back to their locations. As a follow up of the incident, the local Commander in the area held a Flag Meeting with his counterpart on 11 December 2022 to discuss the issue in accordance with established mechanisms. The Chinese side was asked to refrain from such actions and maintain peace and tranquillity along the border," Singh said.

The defence minister said that the issue has also been taken up with the Chinese side through diplomatic channels. "I would like to assure this House that our Forces are committed to protecting our territorial integrity and will continue to thwart any attempt made on it. I am confident that this entire House will stand united in supporting our soldiers in their brave effort," he said. Indian and Chinese troops clashed along the Line of Actual Control (LAC) in Tawang sector of Arunachal Pradesh on 9 December and the face-off resulted in "minor injuries to a few personnel from both sides", the Indian Army said on Monday. The clash near Yangtse along the LAC in the sensitive sector took place last Friday amid the over 30-month border standoff between the two sides in eastern Ladakh.

<https://www.livemint.com/news/india/indiachina-lac-clash-army-can-tackle-transgressions-rajnath-tells-parliament-11670920816808.html>

THE TIMES OF INDIA

China's Bid to 'Change Status Quo' on LAC Thwarted: Rajnath Singh

Chinese troops tried to transgress across the Line of Actual Control at Yangtse in the Tawang sector of Arunachal Pradesh on December 9 in a bid to "unilaterally change the status quo" there but were beaten back by Indian soldiers, defence minister told Parliament on Tuesday. Sources,

on their part, said the 300 troops from the People's Liberation Army (PLA), who intruded across the LAC armed with wooden clubs and sticks, apparently wanted to gain access to a peak that provides a commanding view in the high-altitude region at around 17,000 feet. But the Indian soldiers deployed there, who also called in for reinforcements, forced the PLA troops to retreat in the ensuing protracted hand-to-hand combat that left several wounded on either side with broken bones, bruises and other injuries. China, in turn, on Tuesday alleged Indian troops had "illegally crossed" the disputed border to block a routine PLA patrol during the incident. The Indian Defence minister, however, made it clear that the PLA troops had provoked the face-off, and that India has asked China to "refrain from such actions and maintain peace and tranquillity along the border" through both military and diplomatic channels.

In a brief statement in both Houses of Parliament after a top-level meeting with national security advisor Ajit Doval and Army chief General Manoj Pande, Singh said, "The Chinese attempt (on December 9) was contested by our troops in a firm and resolute manner." "The ensuing face-off led to a physical scuffle in which the Indian Army bravely prevented the PLA from transgressing into our territory and compelled them to return to their posts. The scuffle led to injuries to a few personnel on both sides. There are no fatalities or serious casualties on our side," he added. The minister said the PLA soldiers went back to their locations due to the timely intervention by Indian military commanders. The Indian brigade commander in the area subsequently held a flag meeting with his PLA counterpart on December 11 to stress that China should desist from such actions.

"Our forces are committed to protecting our territorial integrity and will continue to thwart any attempt made on it. I am confident that this entire will stand united in supporting our soldiers in their brave effort," he added. This is not the first time that the PLA has tried to gain access to the 17,000-foot peak in the forbidding terrain at Yangtse, or the 'Mago-Chuna' area as it is militarily called. A similar PLA bid was thwarted by Indian soldiers in October last year, as was reported by TOI. Tawang is one of the most heavily defended regions by India along the 3,488-km LAC with China, which claims it as part of 'South Tibet' and had captured it in the initial days of the 1962 war. Yangtse is one of the eight major flashpoints with China in the eastern sector of the LAC. The others are Namkha Chu, Sumdorong Chu, Asaphila, Longju, Dichu, Lamang and Fish Tail-1 & 2 in Dibang Valley.

<https://timesofindia.indiatimes.com/india/chinas-bid-to-change-status-quo-on-lac-thwarted-rajnath-singh/articleshow/96207838.cms>



Tue, 13 Dec 2022

IAF Closely Monitoring Situation along LAC in Arunachal Pradesh

The Indian Air Force is closely monitoring the situation along the Line of Actual Control (LAC) in Arunachal Pradesh following an attempt by the Chinese PLA troops last week to unilaterally change the status quo in the Tawang sector in the border state, people familiar with the development said on Tuesday. They said the IAF has also stepped up its overall surveillance in

the areas in view of the Chinese attempt of transgression on December 9, adding it follows standard operation procedures that included scrambling of fighter jets in case of specific security concerns. The situation is being monitored closely by both the IAF and the Army,” said one of the people cited above.

The people indicated that the IAF has increased the frequency of the sorties by its combat jets in the region. On Monday, the Indian Army said troops from the two sides clashed along the Line of Actual Control (LAC) in the Tawang sector and the face-off led to “minor injuries” to a few personnel from both sides”. The face-off took place amid the over 30-month border standoff between the two sides in eastern Ladakh. Defence Minister Rajnath Singh said in Parliament on Tuesday that the Indian troops bravely thwarted the attempt by Chinese PLA from “unilaterally” changing the status in Yangtse area of the Tawang sector and there were no fatalities or serious casualties to the Indian troops in the scuffle. “On December 9, PLA troops tried to transgress the LAC in the Yangtse area of Tawang Sector and unilaterally change the status quo. The Chinese attempt was contested by our troops in a firm and resolute manner,” Singh said.

“The ensuing face off led to a physical scuffle in which the Indian Army bravely prevented the PLA from transgressing into our territory and compelled them to return to their posts,” he said. It was the first major clash between the India and Chinese armies since August 2020 near Rinchen La in eastern Ladakh. Indian and Chinese troops were engaged in a brief face-off near Yangtse in October last year as well and it was resolved following talks between local commanders of the two sides as per established protocols.

<https://www.financialexpress.com/defence/iaf-closely-monitoring-situation-along-lac-in-arunachal-pradesh/2911440/>



Tue, 13 Dec 2022

India Scrambled Jets 2-3 Times in Past Weeks Amid Chinese Aggression along Arunachal LAC: Defence Sources

The behaviour of Chinese troops has been very aggressive along the Line of Actual Control (LAC) in Arunachal Pradesh in the last few months, top defence sources told India Today. The development comes after Indian and Chinese troops clashed along the Line of Actual Control (LAC) in the Tawang sector of Arunachal Pradesh on December 9. Both Indian and Chinese soldiers suffered 'minor injuries' due to the face-off, the Army said. Chinese troops want the Indian side to remove a position from the tense Yangtse area in Arunachal Pradesh, where both countries have been locked in a 30-month border standoff in eastern Ladakh. Chinese drones flew aggressively towards the Indian side, after which Su-30 fighters had to be flown to tackle the threat, sources said. Before the recent clash, Chinese drones had moved very aggressively towards the Indian positions on the LAC in Arunachal Pradesh, forcing the Indian Air Force to scramble its fighter aircraft deployed in the region.

"Two to three scrambling of fighter jets have happened in the last few weeks. The IAF has also moved drones very close to Arunachal to counter the Chinese threat," sources added. According to sources, if drones are picked up by radars flying towards Indian territory, necessary actions

have to be taken to prevent any violation. "The Indian Air Force keeps a close watch on Chinese drone activities along the LAC in the northeast. The actions have to be taken as the drones or any aircraft can not be allowed to violate the airspace," defence sources told ANI. The behaviour of Chinese troops has been very aggressive in Yangtse in the vicinity of the Holydip and Parikrama area on the LAC. Meanwhile, Defence Minister Rajnath Singh will make a statement in both houses of Parliament on Tuesday on the clash between Indian and Chinese troops in the Tawang sector of Arunachal Pradesh. Leaders of opposition parties have sought a discussion in Parliament over the India-China clash along the border.

India-China Clash in Arunachal

Indian and Chinese troops clashed along the Line of Actual Control (LAC) in Tawang sector of Arunachal Pradesh on December 9 and the face-off resulted in "minor injuries to a few personnel from both sides", the Indian Army said on Monday. "Both sides immediately disengaged from the area. As a follow up of the incident, own (Indian) commander in the area held a flag meeting with his counterpart to discuss the issue in accordance with structured mechanisms to restore peace and tranquillity," it said.

The clash near Yangtse along the LAC in the sensitive sector took place last Friday amid the over 30-month border standoff between the two sides in eastern Ladakh. In 2020, twenty Indian Army personnel, including a commanding officer (CO), were killed in a fierce clash with Chinese troops in the Galwan Valley in eastern Ladakh. After the Galwan clash, both the countries have engaged in multiple rounds of talks to difuse the border tensions. Both the sides agreed on multiple measures to prevent any aerial escalation after the violation of air space by Chinese in Ladakh sector earlier this year.

<https://www.indiatoday.in/india/story/chinese-behaviour-very-aggressive-along-lac-arunachal-defence-sources-2308542-2022-12-13>



मंगलवार, 13 दिसंबर 2022

तवांग के सहारे पूरे अरुणाचल प्रदेश पर नजरें क्यों जमाए बैठा है चीन?

तवांग एक मौका भर है, लेकिन चीन की पूरी नजर अरुणाचल प्रदेश पर है. कई मौकों पर चीन की रणनीति जगजाहिर भी हुई है. 2019 में जब प्रधानमंत्री नरेंद्र मोदी अरुणाचल प्रदेश के दौरे पर गए तो चीन ने आपत्ति जताते हुए कहा कि यह विवादित इलाका है. भारत और चीन के सैनिकों के बीच अरुणाचल प्रदेश में लाइन ऑफ एक्चुअल कंट्रोल (LAC) पर खूनी झड़प हुई. इस झड़प में भारत के 6 और कई चीनी सैनिकों घायल हुए हैं. 9 दिसंबर को 600 चीनी सैनिक तवांग के यंगस्टे के 17 हजार फीट उंचाई पर भारतीय पोस्ट को हटाने के लिए घुसपैठ करने की तैयारी में थे. सैनिकों को रोकने के लिए भारतीय सेना ने जवाब में लाठी-डंडों का इस्तेमाल किया.

तवांग एक मौका भर है, लेकिन चीन की पूरी नजर अरुणाचल प्रदेश पर है. कई मौकों पर चीन की रणनीति जगजाहिर भी हुई है. 2019 में जब प्रधानमंत्री नरेंद्र मोदी अरुणाचल प्रदेश के दौरे पर गए और 4 हजार करोड़ रुपये की परियोजनाओं का शिलान्यास किया तो चीन ने आपत्ति जताते हुए कहा कि यह विवादित इलाका है. इस हिस्से में किसी तरह की गतिविधि सरहद पर तनाव की स्थिति बना सकती है. तिब्बत की निर्वासित सरकार के प्रमुख लोबसांग सांग्ये ने अप्रैल 2021 में खुलासा करते हुए कहा था कि तिब्बत एक जरिया है, चीन का असली मकसद हिमालयी क्षेत्र में फाइव फिंगर कहे जाने वाले हिस्सों पर कब्जा जमाना है. चीन, तिब्बत पर कब्जे के बाद भारत की तरफ आगे बढ़ रहा है. यही वजह है कि वो अब भारत के साथ सीमा विवाद बनाए रखना चाहता है.

क्या है सीमा विवाद?

1940 के दशक में चीन के दिग्गज नेता रहे माओ ने सिक्किम, अरुणाचल प्रदेश, भूटान, नेपाल और लद्दाख को अपने दाएं हाथ की पांच उंगलियां बताईं. तिब्बत पर कब्जा करने के बाद चीन का मकसद अरुणाचल को हासिल करना रहा. चीन अरुणाचल को दक्षिणी तिब्बत कहते हुए अपना हिस्सा बताता है. इस सीमा विवाद को लेकर भारत और चीन के बीच कई बैठकें हुईं लेकिन उनका कोई नतीजा नहीं निकला. इस विवाद की वजह है चीन का अंतरराष्ट्रीय सीमा रेखा को खारिज करना. चीन और भारत के बीच एक अंतरराष्ट्रीय सीमा रेखा है, जिसे मैकमोहन रेखा कहते हैं. चीन इस रेखा को नहीं मानता. चीन ने मई, 1951 में तिब्बत पर कब्जा किया. भारत और तिब्बत में इसे काला दिन कहा गया. चीन दावा करता है कि यह शांति की एक पहल थी, लेकिन 23 मई, 1951 को ड्रैगन के दबाव में आकर तिब्बत ने समझौते पर हस्ताक्षर किए थे. इस तरह चीन का तिब्बत पर कब्जा हो गया था.

भारत और चीन के बीच 3,500 किलोमीटर लंबी सीमा है. इसी सीमा विवाद को लेकर दोनों देशों के बीच 1962 में जंग हुई, लेकिन विवाद आज भी जारी है.

अंतरराष्ट्रीय स्तर पर क्या यह मान्य है?

अंतरराष्ट्रीय मानचित्रों में अरुणाचल को भारत का हिस्सा माना गया है. चीन, तिब्बत के साथ अरुणाचल प्रदेश पर भी दावा करता है और इसे दक्षिणी तिब्बत कहता है. शुरुआती दौर में शुरु में चीन अरुणाचल प्रदेश के उत्तरी हिस्से तवांग को लेकर दावा करता था, जहां भारत का सबसे विशाल बौद्ध मंदिर है. बाद में पूरे राज्य को अपना बताने लगा. एक बार फिर तवांग के सहारे चीन अरुणाचल प्रदेश को हथियाने की तैयारी में है. 1951 में चीन ने तिब्बत पर कब्जा करने के बाद अक्साई चीन के करीब 38 हजार वर्ग किमी इलाकों को अपने क्षेत्र में मिला लिया था. ये लद्दाख से जुड़े थे. भारत इसे अवैध मानता है.

क्या कहता है अरुणाचल प्रदेश का इतिहास?

1912 तक तिब्बत और भारत के बीच साफतौर पर कोई सीमा रेखा नहीं खींची गई थी. भारत और तिब्बत के लोग भी सीमा रेखा को लेकर जागरूक नहीं थे. तवांग में जब बौद्ध मंदिर मिलने की पुष्टि हुई तो सीमा

रेखा का आकलन शुरू हुआ. 1914 में शिमला में तिब्बत, चीन और ब्रिटिश भारत के प्रतिनिधियों की मीटिंग में सीमा रेखा का निर्धारण किया गया. 1914 में तिब्बत बेशक स्वतंत्र मुल्क था लेकिन ब्रिटिश शासकों ने तवांग और तिब्बत के दक्षिणी हिस्से को भारत का अभिन्न हिस्सा माना. तिब्बतियों ने भी इस पर रजामंदी जताई. चीन इसी बात इतना नाराज हुआ कि उसके प्रतिनिधि बैठक छोड़कर चले गए. 1935 के बाद से यह पूरा इलाका भारत के मानचित्र में आ गया. हालांकि चीन ने तिब्बत को कभी भी स्वतंत्र देश नहीं माना. अब तवांग के जरिए चीन अरुणाचल के हिस्सों पर धीरे-धीरे आगे बढ़ते हुए कब्जा करना चाहता है.

<https://www.tv9hindi.com/knowledge/why-china-eye-on-arunachal-pradesh-via-tawang-all-you-need-to-know-au256-1607734.html>



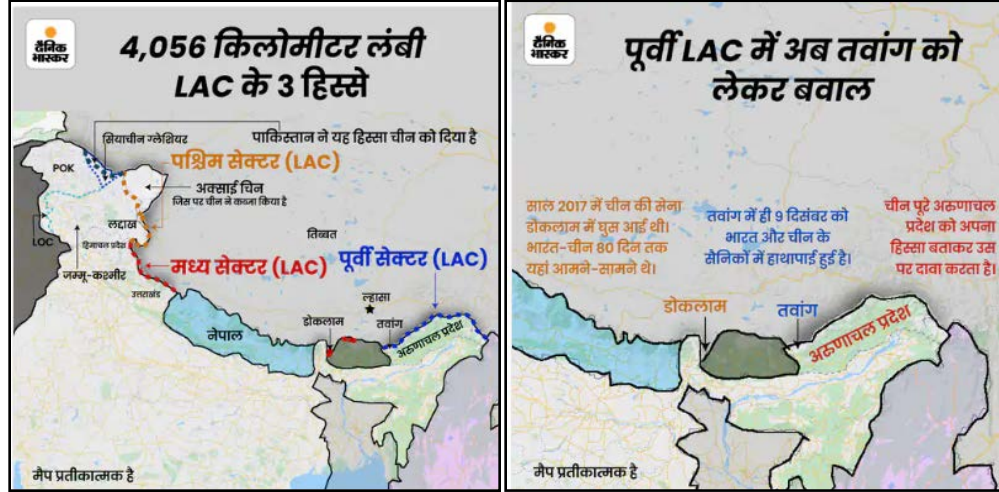
मंगलवार, 13 दिसंबर 2022

अभी और हमले करेगा चीन:भारत को सॉफ्ट टारगेट मान रहा ड्रैगन, तवांग एक ट्रेलर; 4 पाइंट में जिनपिंग का गेम प्लान

16 अक्टूबर 2022 का दिन था। बीजिंग का Great Hall of the People एक जैसे कपड़े और एक ही तरह से बैठे चीनी कम्युनिस्ट पार्टी के 2300 डेलीगेट्स से भरा था। मौका कम्युनिस्ट पार्टी ऑफ चाइना यानी CPC के सम्मेलन का था। CPC चीन की अकेली पॉलिटिकल पार्टी है। कम्युनिस्ट क्रांति के नाम पर यही पार्टी 1948 के बाद से चीन की सत्ता पर काबिज है। पांच साल में एक बार होने वाले CPC के इस सम्मेलन में चीन के सभी बड़े फैसलों पर मुहर लगती है। उद्घाटन भाषण देने राष्ट्रपति शी जिनपिंग के मंच पर पहुंचने का समय होने को था, तभी हॉल के बड़े स्क्रीन पर एक वीडियो चलाया गया। वीडियो 15 जून 2020 को गलवान घाटी में चीन और भारत के सैनिकों के बीच हुई खूनी झड़प का था।

इसमें चीनी सेना का कमांडर कुई फाबाओ आगे बढ़ते भारतीय सैनिकों की तरफ हथियार ताने नजर आ रहा था। कुई को इस सम्मेलन में बतौर डेलीगेट बुलाया गया था। इस एक सीन ने भारत को लेकर चीन के मंसूबों को साफ कर दिया था। इसका मुजाहिरा 9 दिसंबर की रात को अरुणाचल प्रदेश के तवांग में हुआ। जहां चीनी सैनिकों ने LAC पार कर भारत में घुसपैठ करने की कोशिश की। भास्कर एक्सप्लेनर में जानेंगे कि भले ही भारतीय सेना ने चीनी सैनिकों को वापस खदेड़ दिया हो, लेकिन ये जिनपिंग का एक स्ट्रैटेजिक मूव है, जो 2027 तक युद्ध में बदल सकता है...

सबसे पहले 2 मैप में भारत-चीन के बीच LAC पर विवाद वाली जगह देखिए...



1949 में चीन के नेता माओ ने कहा था कि हथेली और जो 5 अंगुलियां हैं, उन्हें वापस लेना चाहिए। हथेली का मतलब तिब्बत है, जबकि 5 अंगुलियां हैं- लद्दाख, सिक्किम, अरुणाचल प्रदेश, भूटान और नेपाल। 2 साल बाद 1951 में चीन ने तिब्बत पर हमला करके उसे अपने कब्जे में ले लिया। 1962 की जंग से पहले भी 1959 से चीन ने भारत के साथ ऐसी छोटी-छोटी झड़पें करनी शुरू कर दी थीं। इसके बाद 1962 में भारत पर पूरा युद्ध थोप दिया था। 1961 की गर्मियों में चीनी सेना ने मैकमोहन लाइन पर गश्त शुरू कर दी। इस दौरान वे कई जगह भारत के इलाकों में घुसने लगे। हालांकि चीन कहता रहा कि उसकी सेना अपने ही इलाकों में है। जवाब में भारत ने चीनी सैनिकों से आगे जाकर चौकियां बनाने की नीति अपनाई, ताकि उनकी सप्लाई को रोका जा सके और वे वापस लौट जाएं। इसे फॉरवर्ड पॉलिसी कहा गया। 10 जुलाई 1962 को 350 चीनी सैनिकों ने चुशुल में एक भारतीय चौकी को घेर लिया। लाउडस्पीकर पर दोनों ओर से बहस हुई तो सैनिक पीछे चले गए।

अगले तीन महीनों तक ऐसी घटनाएं होती रहीं। 20 अक्टूबर को चीनी सेना ने पूरी सरहदी इलाके में भारी हमले शुरू कर दिए और यहीं से भारत-चीन युद्ध की शुरुआत हो गई। 2013 में जिनपिंग राष्ट्रपति बने। इससे बाद वो माओ की हथेली और 5 अंगुलियों की पॉलिसी को तेजी से आगे लेकर जा रहे हैं। 2013 के बाद से लगातार दो-तीन सालों से चीन ऐसी आक्रामक कार्रवाई कर रहा है। चाहे 2017 का डोकलाम विवाद हो, 2020 का गलवान हो या 2022 का अब अरुणाचल विवाद। ये जो झड़पें हैं, इन्हें छोटे तौर पर नहीं लिया जा सकता है। ये एक ट्रेलर देती हैं कि आने वाले वक्त में चीन भारत से युद्ध की हद तक जा सकता है। इसके कुछ मजबूत वजहें दिख रही हैं...

1. ताइवान के मुकाबले भारत ज्यादा सॉफ्ट टारगेट, मदद जुटाने में लगेगा वक्त

मोटे तौर पर चीन को तीन मोर्चों पर मिलिट्री एक्शन का सामना करना पड़ सकता है। पहला- ताइवान, दूसरा- दक्षिण चीन सागर और तीसरा LAC पर भारत से। इनमें पहले दोनों मोर्चों पर चीन के किसी भी

एक्शन पर उसे सीधे अमेरिका, जापान, ऑस्ट्रेलिया की साझा ताकत से युद्ध करना पड़ सकता है। वहीं चीनी सेना भारत को 'लोनली गन' मानती है। यानी भारत पर हमले की स्थिति में उसे अमेरिका समेत पश्चिम देशों का साथ जुटाने में समय लगेगा। ऐसे में अगर चीन को अपनी सेना की ताकत दिखाकर दुनिया को धमकाना पड़े तो भारत ही उसके लिए सबसे सॉफ्ट टारगेट है। जिनपिंग की ताजा कोशिश के पीछे इन पाइंट्स को भी समझिए...

सुस्त बाइडेन : अमेरिका के राष्ट्रपति पद पर जो बाइडेन का होना जिनपिंग के लिए सबसे अच्छी स्थिति हो सकती है। जिनपिंग का मानना है कि बाइडेन भारत के साथ युद्ध की स्थिति में फौरन कोई फैसला नहीं लेंगे।

दुर्गम हिमालय : अगर अमेरिका युद्ध में शामिल होने का फैसला भी करता है तो अमेरिकी सैनिकों और इक्विपमेंट को इतनी ऊंचाई वाले स्थानों पर ले जाना इतना आसान नहीं होगा।

खफा यूरोप : रूस यूक्रेन युद्ध के दौरान मोदी सरकार ने सीधे-सीधे अमेरिका और यूरोपीय देशों पर भरोसा करने के बजाय बीच का रास्ता अपनाया। इससे चीन को लगता है कि भारत पश्चिमी देशों को तेजी से लामबंद नहीं कर पाएगा।

न्यूटल रूस : चीन का मानना है कि भारत से युद्ध के स्थिति में रूस अगर उसका साथ नहीं देगा तो भारत को सीधी मदद भी नहीं करेगा। वैसे भी रूस अभी यूक्रेन युद्ध में फंसा है।

दोस्त पाकिस्तान : चीन, पाकिस्तान को भारत के खिलाफ दूसरा मोर्चा खोलने के लिए राजी कर सकता है।

2. अपने खिलाफ उठ रही आवाज दबाने के लिए युद्ध का धमाका कर सकते हैं शी जिनपिंग

राष्ट्रपति शी जिनपिंग चीन की इकोनॉमी और जीरो कोविड पॉलिसी को लेकर दबाव में हैं। 4 पाइंट्स में समझिए जिनपिंग की 4 सबसे बड़ी चुनौतियां, जिनसे निपटने के लिए वे भारत के खिलाफ एक सीमित युद्ध छेड़कर पूरे देश के अपने पीछे खड़ा करने की कोशिश कर सकते हैं। बैंकों को 17.6 लाख करोड़ का घाटा : दुनिया की जानी मानी इंवेस्टर्स बैंकिंग सर्विस UBS Group AG के मुताबिक, चीन में रियल एस्टेट में आई गिरावट के चलते देश के बैंकों को 212 अरब डॉलर, यानी करीब 17.6 लाख करोड़ रुपए का घाटा हो चुका है। 3.25% की ग्रोथ भी मुश्किल : 2013 में जब शी जिनपिंग राष्ट्रपति बने, तब चीन जापान को पीछे छोड़कर दुनिया की दूसरी बड़ी इकोनॉमी बन चुका था। तब चीन की ग्रोथ 7.85% थी, लेकिन 2019 तक घटते-घटते यह 5.95% पर आ गई। अब इस साल बमुश्किल 3.25% ग्रोथ का अनुमान है।

कर्ज लेने वाले 70% देश मुकरे : BRI यानी बेल्ट एंड रोड इनिशिएटिव के जरिए चीन ने लगभग 150 देशों को ऊंची ब्याज दरों पर 1 ट्रिलियन डॉलर, यानी 83 लाख करोड़ रुपए का कर्ज दे रखा है। 2022 तक इनमें से 70% देश डिफॉल्ट हो चुके हैं। दुनिया में गरीब देशों पर जो कर्ज बकाया है, उसका करीब 40% हिस्सा चीन

का है। यानी चीन ने जो पैसा निवेश किया था, वो डूब रहा है। कोविड पॉलिसी के खिलाफ प्रदर्शन : जिनपिंग की सख्त जीरो कोविड पॉलिसी से चीन के लोगों में काफी गुस्सा है। लाखों लोगों को घरों में कैद होना पड़ा। दिसंबर की शुरुआत में चीन के कई शहरों में जीरो कोविड पॉलिसी के खिलाफ लोग सड़कों पर उतर आए। जिनपिंग पद छोड़ो के नारे भी लगाए थे। दबाव में पहली बार जिनपिंग को जीरो कोविड पॉलिसी में ढील देनी पड़ी है।

3. चीनी सत्ता पर पकड़ मजबूत करने के लिए बड़ी उपलब्धि दिखाना चाहते हैं जिनपिंग

डिफेंस एक्सपर्ट लेफ्टिनेंट कर्नल (रिटायर) जेएस सोदी कहते हैं कि चीन 2027 तक अरुणाचल जैसी आक्रामक कार्रवाई करता रहेगा। इसकी मुख्य वजह है- 2027 में होने वाली कम्युनिस्ट पार्टी की मीटिंग। इसमें जिनपिंग चौथी बार राष्ट्रपति बनने की दावेदारी पेश करेंगे। ऐसे में जिनपिंग को अपने लोगों को बताना होगा कि उन्होंने ऐसा बड़ा क्या किया जिससे वह फिर से राष्ट्रपति बनना चाहते हैं? देखा जाए तो चीन का दुश्मन नंबर एक ताइवान है। लेकिन जिनपिंग ताइवान पर हमला नहीं करेंगे, क्योंकि अमेरिका ढाल बन कर खड़ा है। ऐसे में चीन का दुश्मन नंबर 2 भारत बचता है। चीन भले बेहद आक्रामक रुख अपनाए, लेकिन फिलहाल भारत बढ़ाना नहीं चाहता, 3 पॉइंट्स इसका इशारा कर रहे हैं...

1. अमेरिकी राजदूत का खुलासा : भारत में अमेरिका के राजदूत रह चुके केनेथ जस्टर ने मार्च 2022 में एक टीवी शो में कहा कि QUAD यानी अमेरिका, जापान, भारत और ऑस्ट्रेलिया के बीच नौसैनिक और कूटनितिक गठबंधन से जुड़ी प्रेस रिलीज या बातचीत में भारत चीन का जिक्र नहीं चाहता। भारत सीधे-सीधे चीन को पोक करने को लेकर काफी चिंतित रहता है।

2. UN में चीन की मदद : चीन के शिनजियांग में उइगर मुस्लिमों के मानवाधिकार पर यूनाइटेड नेशन्स ह्यूमन राइट्स काउंसिल में बहस के प्रस्ताव पर वोटिंग में भारत ने हिस्सा नहीं लिया। जबकि QUAD के बाकी तीनों देशों यानी अमेरिका, जापान और ऑस्ट्रेलिया ने बहस करवाने के पक्ष में वोट दिया। कुल मिलाकर 47 सदस्यों में 19 देशों ने बहस करवाने के खिलाफ वोट दिया और 17 ने पक्ष में, इस तरह चीन के खिलाफ वोटिंग नहीं हो सकी।

3. भारी कारोबारी घाटा : चीन भारत का सबसे बड़ा कारोबारी पार्टनर है। 2022 के शुरुआती 9 महीनों में भारत में चीन के इंपोर्ट में 31% का इजाफा हुआ। भारत ने चीन से रिकॉर्ड 89.66 अरब डॉलर का इंपोर्ट किया। इस दौरान भारत से चीन को किए गए एक्सपोर्ट में 36.4% की गिरावट हुई। भारत ने सिर्फ 13.96 अरब डॉलर का माल एक्सपोर्ट किया। यानी भारत को 75.7 अरब डॉलर का कारोबारी घाटा हुआ। इस कारोबारी घाटे के चलते भी भारत अक्सर चीन के खिलाफ कड़ा रुख अख्तियार नहीं कर पाता। अब आखिर में भारत के थलसेना प्रमुख जनरल मनोज पांडे का एक बयान। 12 नवंबर को एक इंटरव्यू में उन्होंने बताया कि दोनों सेनाओं के बीच 16 दौर की बातचीत के बावजूद चीन ने LAC से फौज कम नहीं की है।

सरहदी इलाकों में चीनी सेना लगातार इंफ्रास्ट्रक्चर खड़ा कर रही है। हालात तो स्थिर हैं, लेकिन कुछ कहा नहीं जा सकता है।

<https://www.bhaskar.com/db-original/explainer/news/china-xi-jinping-aggression-explained-india-army-pla-soldiers-clash-ladakh-arunachal-pradesh-130675642.html>

THE TIMES OF INDIA

Wed, 14 Dec 2022

Incursion, Drones, Border Infra Show China Unlikely to Back Off

The 'pre-planned manner' in which the People's Liberation Army (PLA) tried to alter the status quo at Yangtse last week and the recent spike in Chinese air activity in the region reinforces the Indian defence establishment's assessment that China has no intention of de-escalating tensions along the entire Line of Actual Control (LAC). "China will continue with its salami-slicing tactics to eat into Indian territory and keep us off-balance. After eastern Ladakh, the next target could be , especially the Tawang area, which China covets and claims as South Tibet," a source told TOI on Tuesday. While face-offs have taken place in the past at Yangtse, which is 25km north-east of Tawang, the number of Chinese troops involved in the December 9 incident was unusually large at around 300. "Such an action would require sanction right from the top PLA hierarchy," the source added.

China has also stepped up deployment of drones and helicopters along the LAC across Arunachal Pradesh in recent times, which led the IAF to scramble Sukhoi-30MKI fighters "two-three times over the last two-three weeks" as an air defence measure. "The drones did not violate Indian airspace but did come towards Indian troop positions along the LAC," another source said. Much like in Ladakh, China has also strengthened its military positions in the eastern sector of the LAC, especially across Tawang. China, in fact, claims 90,000sqkm of Indian territory in Arunachal Pradesh as 'South Tibet'. "New Chinese 'dualuse' border villages also keep on coming up in the disputed stretches of the LAC in the eastern sector. They are used to reinforce PLA positions," an officer said.

In eastern Ladakh, China has so far refused to discuss troop disengagement at the two crucial face-offs at the strategically-located Depsang Plains and Charding Ninglung Nallah track junction at Demchok. India wants to take up the two "friction points" at the 17th round of corps commanderlevel talks but the date is yet to be finalised despite the last round being held on July 17. The most glaring pointer to China's recalcitrance is the way it continues to systematically strengthen military infrastructure like troop bunkers and helipads, gun and missile positions, roads and bridges, communication and radar sites all along the 3,488km LAC stretching from eastern Ladakh to Arunachal Pradesh.

The PLA, for instance, has completed the construction of a division-level headquarters, along with other infrastructure including shelters for troops, weapons and vehicles, near the 'no patrol buffer zone' created after the troop disengagement at Pangong Tso in February 2021. The PLA

has also constructed two bridges across the Pangong Tso in the Khurnak Fort area, illegally occupied by China since 1958, for better connectivity of its troops between the north and south banks of the brackish lake, as earlier reported by TOI. Similarly, dozens of new Chinese tents and other facilities have come up in the Depsang Bulge region, where the PLA has been actively blocking Indian soldiers around 18km inside of what India considers its own territory from going to their traditional patrolling points ever since April-May 2020. "The PLA, it seems, is there to stay," an officer said.

<https://timesofindia.indiatimes.com/india/incursion-drones-border-infra-show-china-unlikely-to-back-off/articleshow/96207761.cms>

THE ECONOMIC TIMES

Tue, 13 Dec 2022

Kalyani Rafael Advanced Systems Rolls out MRSAM Kit for Indian Armed Forces

Kalyani Rafael Advanced Systems Pvt Ltd (KRAS) on Tuesday rolled out the 100th Medium Range Surface to Air Missile Kit for delivery to the Indian Armed Forces. According to a release from the company, the kit is part of the MRSAM Air Defence Missile jointly developed by Rafael Advanced Defence Systems Ltd and DRDO and manufactured in collaboration with Indian industry comprising both private and public sector players including MSMEs. Speaking on the occasion, Baba N Kalyani Chairman, and Managing Director, Bharat Forge Ltd said KRAS is proud to accelerate the delivery of the 100th MRSAM Missile Kit for the Indian Armed Forces. "This delivery is not only a shining example of synergy between India & Israel and the private and public sector but also reinforces our commitment to Atma Nirbhar Bharat as envisioned by our Prime Minister Shri Narendra Modi".

He also added that "apart from the missile kits, we will extend our support in Maintenance and Repair Operations of in service Air Defence Missile Systems to the Armed Forces," Kalyani said. Yoav Har-Even President and CEO Rafael said the Israeli firm has been a reliable partner to the Indian Armed Forces for almost three decades and these missile kits are a testimony of our commitment to Aatma Nirbhar BharAT. KRAS, being a joint venture is a testament to the enhanced cooperation between Israel and India in the strategic defence sector, as it leverages the technology of Rafael with the engineering strength of the Kalyani Group, he added.

<https://economictimes.indiatimes.com/news/defence/kalyani-rafael-advanced-systems-rolls-out-mrsam-kit-for-indian-armed-forces/articleshow/96194612.cms>



Tue, 13 Dec 2022

100th Surface-to-Air Missile Kit Delivered to IAF

Kalyani Rafael Advanced Systems (KRAS) on Tuesday announced the rolling out of its 100th Medium Range Surface to Air Missile (MRSAM) mid-section kit. The kit was delivered to the Indian Air Force. The MRSAM kit is a collaborative effort of KRAS and the Defence Research

and Development Organisation (DRDO). CMD of Bharat Forge Ltd., Baba N Kalyani expressed his intentions to make the company a “missile house” that would produce modern weapons for the defence of India and also high-quality hardware for the Indian armed forces. He expressed confidence that the industry would soon surpass the target of achieving \$5 bn in defence exports by 2025. Speakers said that Tuesday’s development and the collaborative efforts between Indian and Israeli companies affirm the commitment to indigenisation and Prime Minister Narendra Modi’s vision of Atmanirbhar Bharat.

Distinguished scientist B.H.V.S. Narayana Murthy congratulated KRAS for delivering the 100th mid-section. He said that given the significant milestone, a speeding up of deliveries to the armed forces is required and expressed confidence that given the available infrastructure, that too would be achieved. Director of DRDO’s Research Centre Imarat U. Raja Babu congratulated both companies on the roll-out and also requested KRAS to accelerate deliveries. Speaking to the media on the sidelines of the event, Major General (retired) Yoav Har-Even said Rafael has supplied different kinds of missiles to the Indian armed forces. “We understood the vision and the mission of Make in India. This is why we established this joint venture with Kalyani Group almost six years ago and this is parallel with what we are doing with PSUs. Our mission at the end of the day is to be able to produce, supply and support all relevant systems that Rafael has,” he said. He said that the company has invested several million dollars and is willing to invest more according to the investment opportunities.

<https://www.thehindu.com/news/national/telangana/100th-surface-to-air-missile-kit-delivered-to-iaf/article66259131.ece>



Tue, 13 Dec 2022

Why the Modi Govt. Wants to Lighten the DRDO Chief’s Workload

By Pradip R. Sagar

After opening the doors of India’s premier defence research agency DRDO (Defence Research and Development Organisation) to private players, wherein they will operate government assets thus sparing them the need to invest in land, machinery or other support infrastructure, the Union government is now considering bifurcation of the post of DRDO chairman and secretary-research and development in the ministry of defence (MoD).

The DRDO operates with 8,000 scientists and about 50 laboratories and has an annual budget of about Rs 20,000 crore. Traditionally, the DRDO chief has held the post of secretary-R&D in addition to the post of scientific advisor to the defence minister. The Prime minister’s Office (PMO) is spearheading the change, which is aimed at achieving better efficiency and ease of functioning of the DRDO. However, some believe it’s an attempt by the ‘IAS lobby’ to take control of the premier defence research agency and maintain its supremacy in MoD. “Bifurcating the post of DRDO chairman and secretary-R&D appears to be the need of the hour as the DRDO’s track record of meeting project deadlines has not been up to the mark. With lesser responsibility, the DRDO chairman will be able to devote more time and energy on defence

programmes,” said a senior MoD official, adding that the success of any defence project depends on finance, utilisation of manpower and efficient movement of file within the bureaucracy.

In August this year, the Union government appointed scientist Samir V. Kamath as the new DRDO chief. Kamath took over from G. Satheesh Reddy, who was given the responsibility of scientific advisor to the defence minister. The Modi government had bifurcated the two posts in 2015. The broad impression is that defence scientists are experts in taking technical decisions but not well-versed with financial and other administrative matters, and that this often leads to project delays. Also, DRDO labs have to depend on cadre from the Armed Forces Headquarters Civil Services for financial and administrative tasks. Another senior MoD official said a bureaucrat holding the post of secretary-R&D can manage administrative and financial tasks better than a scientist. He proposed that DRDO be managed on the lines of other scientific institutions such as ISRO (Indian Space Research Organisation) and BARC (Bhabha Atomic Research Centre).

It is perceived that the reason for a large number of scientists approaching the Central Administrative Tribunal (CAT) and high courts to challenge their service rules or appointments is their limited understanding of administrative matters. Moreover, by bifurcating the DRDO chief’s post, the government wants to have a holistic approach towards the private sector when it comes to R&D. In the current Union budget, the government has earmarked 25 per cent of R&D funds of MoD for the private industry, start-ups and academia. The Narendra Modi government has taken several measures to boost indigenous defence manufacturing, through initiatives such as Aatma Nirbhar Bharat, and boost defence exports. MoD has set an ambitious defence exports target of Rs 35,000 crore by 2025.

<https://www.indiatoday.in/india-today-insight/story/why-the-modi-govt-wants-to-lighten-the-drdo-chiefs-workload-2308743-2022-12-13>

THE ECONOMIC TIMES

Tue, 13 Dec 2022

Indian Naval Chief Admiral kumar on Sri Lanka Visit to Strengthen Bilateral Maritime Ties

Indian Navy chief Admiral R Hari Kumar arrived here on Tuesday to strengthen the existing bilateral maritime relations between India and Sri Lanka and enhance capacity-building initiatives towards ensuring peace in the region. Earlier in the day, indigenous INS Sahyadri, a multi-role missile frigate of the Indian Navy, also made a port call at Colombo to complement the visit of the Chief of Naval Staff (CNS), according to a press statement. The ship would engage in training engagements with the Sri Lankan Navy and participate in Maritime Partnership Exercises with it. Admiral Kumar, who is on a four-day official visit to Sri Lanka, is in Colombo at the invitation of Sri Lanka Navy Commander Vice Admiral Nishantha Ulugetenne, the Indian High Commission here said. The visit of Admiral Kumar symbolises strong relations and close cooperation between the two neighbours, with Sri Lanka being accorded the status of 'Priority One' partner by India, the statement said.

The visit would strengthen the existing bilateral maritime relations between the two countries. Areas of common security concern and enhancing capacity and capability-building initiatives towards ensuring peace in the region would be discussed during the visit, it said. "The visit is also indicative of the growing camaraderie and friendship between the two nations in line with India's 'Neighbourhood First' policy," the statement added. Admiral Kumar was received by Vice Admiral Ulugetenne at the Naval headquarters here. The two leaders discussed several matters of importance and recalled the long-standing relationship between the two Naval forces, it said. During his visit, Admiral Kumar will call on President Ranil Wickremesinghe, Prime Minister Dinesh Gunawardena and Minister of State for Defence Pramitha Bandara Tennakoon. He will also meet the Defence Secretary, Chief of Defence Staff and Service Commanders.

Admiral Kumar will be the Chief Guest at the passing out parade of Naval and Maritime Academy at Trincomalee on December 15. Admiral Kumar's visit follows the Indian Navy's supply of a maritime reconnaissance aircraft to Sri Lanka Air Force in August 2022 to augment its maritime capabilities, the statement said. "Indian Navy is also providing customised and specialised training to Sri Lanka Navy, including in marine technology," it said. Admiral Kumar's visit comes nearly four months after the docking of a Chinese spy ship at Sri Lanka's Hambantota port triggered a diplomatic row between New Delhi and Colombo.

<https://economictimes.indiatimes.com/news/defence/indian-naval-chief-admiral-kumar-on-sri-lanka-visit-to-strengthen-bilateral-maritime-ties/articleshow/96197707.cms>



Tue, 13 Dec 2022

Op Doctrine and Mil Tech Must Be in Sync

By Col Ashwani Sharma (retd)

When the cold war era ended with the collapse of the Soviet Union in the early 1990s it was widely believed that the threat of a conventional war would gradually diminish and gradually make way for grey zone tactics. Come February 2022 and the multi pronged offensive on Ukraine changed all of that. It demonstrated that Russia remains a threat beyond the clandestine soft power approaches (grey zone). It is prepared to invade and attack; by extension, so are the militaries elsewhere in the world. The Ukraine conflict has provided a superb opportunity for military analysts to observe Russia on the battlefield. It has also provided a window into how today's wars require a level of agility, and rapid innovation and integration that has never before been executed at this scale by a nation's military.

Right from the start, Ukraine forces were outgunned and outnumbered. Theoretically speaking, this conflict should have been over months ago. President Putin and General Gerasimov predicted running over Ukraine in a flash. But the conflict continues to defy the predictions of experts. That is partly because Russia's military doctrine is nowhere near as advanced as suspected – their planning for this incursion was limited; and their command and control

capability has been lacking. Surprisingly, Russian tactics in 2022 are not significantly different from those of the 1970s.

The US and NATO have played a major part in stalling the Russian invasion by providing military, moral and psychological support to Ukraine. Constant and precise information about the Russian military's moves and manoeuvres to Ukraine, accompanied by easy to use precision weapons and missiles to strike the targets inflicted heavy casualties on the Russian military. Social Media networks, owned and operated by the West ran narratives favourable to the Ukrainian cause (and theirs') and denied Russia the use of such platforms. Russia was flat footed in dealing with Information warfare; it has been a one sided affair. Credit of course is due to the ability of Ukraine's forces to embed agile principles into their approach to defending their country. The mind-set of facing an existential threat can also not be underestimated. Embracing rapid innovation, trying new and inventive things quickly, and accelerating the integration of novel ideas and approaches to repel Russia's military advantage all have made a significant difference to how this conflict has developed. This has been most obvious in three areas – technology, training, and doctrine.

The use of advanced communications, drones and other autonomous assets would normally require years of planning and adaptation – but in Ukraine, that adaptation is happening in the field and it is proving successful. They have also been given access to SpaceX's Starlink, allowing Ukrainian military command to talk to its frontline soldiers on a secure link and direct them in operations. Here, Ukrainian forces have demonstrated impressively rapid innovation and integration. They have quickly improved the efficacy of their existing military capabilities by using the tools given to them. For example, they have combined radars and quantum computing to work out the exact location of Russian artillery. It uses algorithms to track the trajectory of Russian missiles and calculate where they originated and then counterattack with accuracy.

Are all these techs changing the nature of warfare?

The answer is yes. Is it changing war? Not really. The principles of war remain much the same as they existed during the times of Chanakya, Alexander the great, Yom Kippur or Operation Desert storm. In the last 100 years we have moved from Positional warfare to blitzkrieg, counter blitz, Rapid Action Force, Extended defences (Geographical and time dimensions which now stand annulled) to AirLand battle and now NCW. AirLand battle became the primary battleplan of US NATO in the early 80s. Its roll-out required upgrades to the C4I, along with similar changes in the command and control structures to take advantage of the massive information the new C4I assets would be generating. Today, we embrace a new doctrine- the NCW made possible by the digital revolution.

Should we Adopt and induct New tech?

Yes, because that obviously is the way forward. But not in a hurry because we need the necessary infrastructure in place before we do that. By that I mean a doctrine, tech sustainment facility, training etc. The challenge posed by the above situation is that warfare has evolved faster than the warfighter. Today, a nation's or military's ability to incorporate new technologies with an effective supporting infrastructure is critical to achieving its objectives which will ensure victory, whether on the tactical, kinetic contact battlefield or in the realm of non-kinetic statecraft and psychological dominance. The recent events(Syria, Armenia, Ukraine) have alluded to the resurgence of force on force, highly kinetic warfare and the role that technology along with its enabling infrastructure will play in the outcome.

‘Enabling Infrastructure’ transcends from the tactical to the strategic realm depending on the type and impact of the technology. Including intrinsic tactical parts like development, testing, procurement, maintenance, training and technical capability building to more operational and strategic elements like coordination with other technologies, systems, forces, impact on objectives etc should help evolve tactical and strategic doctrines. The fact that technology plays a vital role in the warfare and the infrastructure required to enable technology to be an effective weapon is undeniable. Increasingly, the world is moving toward Artificial Intelligence, Augmented Reality, Stealth Systems, Drones, and Robotics et al. These new age domains require an even more effective and robust enabling infrastructure to be able to shape the battlefield.

Innovative Training

Training is another area where speed of innovation and integration has enabled success beyond expectations. Ukraine’s forces now employ NLOS, Javelin missiles and multiple launch rocket systems (MLRS) to fend off Russian attacks. A regular soldier would have undertaken 16 to 20 weeks of basic training, a further 8 to 10 weeks of specialised training on these weapons before firing one in earnest. For the Ukrainian conflict, this has been compressed to less than six weeks. The training does not appear less effective, it is simply less time consuming, less reliant on basic training experience, and being deployed at the speed of relevance. It has also been adapted for use by members of the public, who put themselves at risk alongside practised soldiers on the battlefield to bolster combat mass. The existential threat has created the need, but surely the successes provide vital lessons in training efficiency and optimisation going forward.

Effective Doctrine

Innovations are happening in parallel. There are numerous examples of departure from established military doctrine with great success. Conventional wisdom says that to stop enemy tanks requires using your own armour and creating solid defensive networks. Yet, during the early battles around Kyiv, Ukrainians were simply given anti-tank weapons and told to use their initiative to seek and destroy, with great success to date. Against the might of the Russian military, Ukrainian forces have been able to slow Russia’s progression, expose their tactical deficiencies, and even win back certain parts. Ukraine’s response to Russia’s invasion has involved civilian support, advanced technology from overseas and novel training methods – all designed to accelerate successful effects. But it is the shift in mindset, away from the protracted procurement, integration and training programmes so typical of most militaries today, in favour of a more iterative approach to ‘combat innovation’ that has had the greatest impact. In conclusion, it will be right to state that whilst having the right tools is important, having the agility and innovativeness to try new things in different ways, adopt and use them at the relevant pace is what generates unexpected outcomes and success.

<https://www.financialexpress.com/defence/op-doctrine-and-mil-tech-must-be-in-sync/2911421/>

चीन ने भेजे परमाणु हमला करने वाले फाइटर: 24 घंटे में 18 H-6 बॉम्बर ने की घुसपैठ, ताइवान बोला- यह हम पर हमला करने की कोशिश

9 दिसंबर को भारत के अरुणाचल प्रदेश में घुसपैठ की नाकाम कोशिश के बाद अब चीन ने ताइवान में अपने लड़ाकू विमान भेजे हैं। मंगलवार सुबह ताइवान के रक्षा मंत्रालय ने इसकी पुष्टि की है। मंत्रालय ने बताया कि पिछले 24 घंटों में चीन ने 18 H-6 बॉम्बर ताइवान के एयर डिफेंस जोन में भेजे हैं। जो परमाणु हमला करने में माहिर हैं। मंगलवार को एयर डिफेंस में आए 18 लड़ाकू विमानों को ताइवान में 2020 के बाद चीन की अब तक की सबसे बड़ी घुसपैठ के तौर पर देखा जा रहा है। दरअसल दोनों देशों के बीच संबंध लगातार खराब होते जा रहे हैं। इसी के चलते पिछले दिनों चीन ने ताइवान से आयात किए जाने वाले खाने, शराब और सी फूड जैसी कई चीजों पर भी बैन लगा दिया था। ताइवान पर चीन ने व्यापार के अंतर्राष्ट्रीय नियमों का उल्लंघन करने के आरोप लगाए थे।

चीन और ताइवान के बीच लगातार बिगड़ रहे हालात

H-6 चाइना का लंबी दूरी तक हमला करने वाला सबसे मुख्य बॉम्बर है। AFP की रिपोर्ट के मुताबिक ताइवान लगातार चीन की तरफ से होने वाली घुसपैठ पर हमले की चिंता जाहिर कर रहा है। ताइवान के विदेश मंत्री जोसेफ वू ने 'द गार्डियन' को दिए इंटरव्यू में कहा कि चीन अब ताइवान में घुसपैठ के लिए बहाने ढूंढ रहा है।

<https://www.bhaskar.com/international/news/18-h-6-bombers-infiltrated-in-24-hours-taiwan-said-it-is-trying-to-attack-us-130674329.html>



Tue, 13 Dec 2022

China Sends Record Wave of Bombers into Taiwan Defence Zone

China sent a record 18 nuclear-capable bombers into Taiwan's air defence zone, Taipei said Tuesday, just days after Beijing banned more Taiwanese imports in the latest sign of deteriorating ties. Democratic Taiwan lives under the constant threat of invasion by China, which sees the self-ruled island as part of its territory to be seized one day. Beijing has ramped up military, diplomatic and economic pressure since the 2016 election of Taiwanese President Tsai

Ing-wen, who rejects its stance that the island is part of China. In a daily update on Tuesday morning, Taiwan's defence ministry said 21 aircraft entered the island's southwest air defence identification zone (ADIZ) over the last 24 hours, including 18 nuclear-capable H-6 bombers. That represents by far the largest daily sortie by H-6 bombers since Taipei first began releasing daily incursion data in September 2020, according to a database maintained by AFP.

The wave came after China slapped fresh import bans on Taiwanese food, beverages, alcohol and fishery products last week, prompting Premier Su Tseng-chang to accuse Beijing of violating international trade rules and "discriminating" against the island. The H-6 is China's main long distance bomber and is able to carry nuclear payloads. It is rare for China to send more than five H-6 bombers in one day. But sorties have increased dramatically in recent weeks. Until recently October 2021 was the month with the largest number of H-6 flights on record at 16. But last month China sent 21 of the bombers into Taiwan's ADIZ. And the current tally for December stands at 23.

Many nations maintain air defence identification zones (ADIZ), including the United States, Canada, South Korea, Japan and China. They are not the same as a country's airspace. Instead, they encompass a much wider area, in which any foreign aircraft is expected to announce itself to local aviation authorities. Taiwan's ADIZ is much larger than its airspace. It overlaps with part of China's ADIZ and even includes some of the mainland.

<https://www.thehindu.com/news/international/china-sends-record-wave-of-bombers-into-taiwan-defence-zone/article66258652.ece>



Wed, 14 Dec 2022

Analysing U.S.-China Bilateral Ties

Anand V., Uday Nitin Patil

The story so far: U.S.-China relations have witnessed an unprecedented downturn in 2022. Nancy Pelosi's historic visit to Taiwan in August has deeply upset bilateral ties. The imposition of heavy restrictions on China's semiconductor industry by the U.S. in October has fanned the flames of rivalry further. Amid this escalation, the U.S. President Joe Biden and Chinese President Xi Jinping had their first in-person interaction on the sidelines of the G-20 summit in Bali in November, signalling a probable relaxation of the growing tensions.

How did relations sour between U.S. and China?

The U.S. and China, ever since the establishment of diplomatic relations in the later part of the Cold War, have worked toward enmeshing their economic systems from the perspective of economic complementarity and strategic convergence. As a result, China rose to the status of the second largest economy and got itself ingrained into the global economy. This eventually translated into China's growing economic competence as well as its rising political ambition and might. China then started to systematically undermine U.S. global dominance through military and diplomatic means. This happened at a time when there was a growing perception of U.S.

decline amidst the global financial crisis and its entrenchment in the “forever wars” of Afghanistan and Iraq.

Under Xi Jinping, China’s assertiveness rose further, as its quest for primacy in the world stage became increasingly apparent. With Donald Trump’s entry into the White House, the U.S. concerns about the threat from China reached critical levels. The Trump administration took progressively confrontational steps towards China, with growing bipartisan backing. The administration’s imposition of tariffs on China’s exports turned into a “trade war” which started to reverse the trajectory of U.S.-China relations. Though Mr. Biden succeeded Mr. Trump, the policy on China did not change significantly, as the momentum for “decoupling” bilateral relations did not just continue, but kept on gathering pace. China’s crackdown in Xinjiang and Hong Kong, its “wolf warrior diplomacy” during the COVID-19 blame game, its evident support to Russia during the Ukraine crisis, and its escalating offensive posturing towards Taiwan, made it imperative for the U.S. to continue with a confrontational posture towards China.

The year 2022 witnessed the relations descend into an abysmal trajectory with the Speaker of the U.S. House of Representatives, Nancy Pelosi visiting Taiwan. The visit was extremely significant in light of sabotaging the U.S.’s stated commitment to the One China Policy as well as bolstering its commitment towards the defence of Taiwan. China expressed its exasperation through large scale military drills seemingly aimed at blockading Taiwan and signalling the U.S. of its intent to respond in kind. China has been going on an overdrive to gain technological dominance in the fourth Industrial Revolution over the U.S. In order to undercut China’s growing technological prowess, the U.S. imposed a series of restrictions on China targeting its semiconductor chip industry. With tensions reaching a peak, the G-20 summit held at Bali provided an opportunity for the leaders of both the countries to hit the pause button on the deterioration of ties.

What was discussed between the two leaders on the G-20 sidelines?

Mr. Biden and Mr. Xi discussed outstanding matters related to U.S.-China relations for nearly three hours at Bali. There was no joint statement released after the meeting, although both sides provided their own perspectives on issues of mutual concern. Easing tensions and reopening channels of communication were agreed upon by both the leaders. The U.S. President expressed that both the countries should “manage the competition responsibly and maintain open lines of communication”, and that the U.S. is not looking for conflict with China. However, he said that the U.S. “will continue to compete vigorously” with China. Mr. Biden proposed promoting U.S.-China cooperation on the issues of climate change, global macroeconomic stability, as well as global health and food security. He also underlined the human rights concerns surrounding China’s activities in Xinjiang, Tibet and Hong Kong.

On the other hand, the Chinese President stated that the relationship should not be seen by the U.S. through the prism of “democracy versus authoritarianism”. Mr. Xi also re-emphasised Taiwan’s position as being at “the very core of China’s core interests” as well as the “the bedrock of the political foundation of China-U.S. relations”, which the U.S. needs to respect. Meanwhile, Mr. Biden reiterated that the U.S.’s commitment to the One China Policy had not changed, and that it will oppose “any unilateral changes to the status quo by either side”. This is despite Mr. Biden’s several previous statements which contradicted this stance. Mr. Xi also noted the “five noes” previously mentioned by Mr. Biden — not seek a new Cold War; not seek to change China’s system; not to revitalise its alliances against China; not to disturb the cross-

Strait status quo; and not look for conflict with China. Mr. Xi stressed that both the countries needed to “explore the right way to get along”.

What does the future hold?

The recent meeting between the two heads of states certainly imply that there is a move toward bringing in more stability into bilateral relations. However, to what extent could this move be aimed at taking the relations to where it was before the trade war remains questionable. For one, China has not moved away from its path to attain its long term goal of centrality in the international system. In fact, Xi Jinping has at multiple times underlined China’s time bound aspiration to achieve such a goal through phased modernisation of the country. China’s more specific objectives like the reunification of Taiwan with the mainland has been underscored by Mr. Xi most recently in November during the 20th National Congress of the Chinese Communist Party, where he consolidated his exceptional third leadership term. Further, it has to be noted here that the “new era” of Xi Jinping is marked by China’s efforts to project rather than conceal its capabilities.

On the other hand, the Biden administration has continued with intensifying the U.S.’s rivalry with China by expanding it beyond trade and into avenues like technology and political freedoms. It has also utilised multilateral approaches like strengthening the Quad in the Indo-Pacific, and the founding of the Indo-Pacific Economic Framework. However, the administration has coated these efforts with a veneer of moderation and accommodation to demonstrate some distinctiveness with the previous administration. For instance, the current U.S. administration’s China policy outlined in May by the Secretary of State Antony Blinken identified China as the “most serious long-term challenge” to the international order. Nevertheless, it presented a three-pillar approach towards China — “invest, align, compete”. This showcases the Biden administration’s intent to deal with the threat posed by China without sliding into an inadvertent conflict. Thus, the long-term trajectories of both countries do not seem to be poised for a reset; rather, both seem to be buying time and reducing unnecessary risks while the strategic rivalry unfolds.

<https://www.thehindu.com/news/international/explained-analysing-us-china-bilateral-ties/article66260034.ece>



Wed, 14 Dec 2022

The UK Defense Chief Read out the Numbers on Russia's War Losses, and They're Bleak

After nearly 10 months of war in Ukraine, the UK's defense chief revealed this week a bleak set of figures on Russian military losses. "We can say that we estimate over 100,000 Russians are either dead, injured, or have deserted," UK Defense Secretary Ben Wallace said on Monday as he delivered updates on the war to London's House of Commons. This figure reflects a similar estimate from top US Gen. Mark Milley, who said in early November that over 100,000 Russian soldiers had been "killed and wounded" since Moscow launched its large-scale invasion on

February 24. At the time, he noted that Ukraine's military has "probably" seen similar casualties. Additionally, Wallace noted Russia has lost 4,500 armored vehicles, 63 fixed-wing aircraft, 70 helicopters, 150 unmanned aerial vehicles (UAVs), 12 naval vessels, and over 600 artillery systems. He did not specify the make and model of each of these weapons systems.

According to the open-source intelligence operation Oryx, Russian forces have lost over 8,400 vehicles or pieces of equipment — meaning it was either destroyed, damaged, abandoned, or captured. Specifically, the country has lost over 1,500 tanks, more than 700 armored fighting vehicles, 160 multiple rocket launchers, and nearly 300 self-propelled artillery systems. Russian troops abandoned massive amounts of weaponry, ammunition, and equipment during Ukraine's lightning-fast counteroffensive in the country's northeast Kharkiv region. The blitz-style campaign saw Kyiv liberate thousands of square miles of territory earlier in the fall that was previously under Russian occupation.

As they quickly fled their positions in the face of the advancing Ukrainians, Russian forces abandoned an overwhelming amount of military equipment. And adding to its many problems, Russia has been rapidly burning through its stockpiles of munitions faster than it can replenish them, forcing it to rely on older, less reliable weapons and ammunition pulled from storage and to turn to pariah states like Iran and North Korea for assistance. Beyond just weapons and personnel, Wallace said that Russia has also "failed to capture a single one of its major objectives from day one," adding that Russian President Vladimir Putin's "three-day war, 'or special operation,' ... turns out to be a disaster for him and his army." His remarks appear to reference Putin's pre-war expectations that Kyiv would fall in a matter of days and the term "special military operation" that the Russian leader has used to avoid calling the conflict what it actually is — a war. Months later, the bloody campaign continues to show no signs of slowing down. The Kremlin rejected a Ukrainian call for Russia to withdraw troops at Christmas.

In November, Colin Kahl, the undersecretary of defense for policy at the Department of Defense, said that the Russian military has "suffered a massive strategic failure" in Ukraine, adding that "Russia will emerge from this war weaker than it went in."

https://www.businessinsider.in/international/news/the-uk-defense-chief-read-out-the-numbers-on-russias-war-losses-and-theyre-bleak/amp_article/show/96207989.cms



Tue, 13 Dec 2022

US Fears Russia could Sell its ‘Most Advanced’ S-400 Air Defense System to Iran on Top of SU-35E Fighters

With the growing defense partnership between Russia and Iran, Western officials anticipate that Moscow could supply some of its best military equipment to Tehran. While the most widely speculated system is the Su-35E fighter jet, there are reports that Moscow could also be negotiating to supply the S-400 air defense system to Tehran. According to US Officials, Russia could shed its past inhibitions and finally decide to sell its ‘most sophisticated’ air defense systems to Iran in return for a massive supply of drones and missiles. Last week, the US National

Security Council spokesman John Kirby told The Washington Post, “We are concerned that Russia intends to provide Iran with advanced military components.” Even though he did not specify which system but agreed “that could include air defense.” Since Iran already operates the S-300 air defense system provided by Russia, the natural speculation is that S-400 could be considered for sale to the country.

S-400 is a mobile, surface-to-air missile system (SAM) that can engage aircraft, unmanned aerial vehicles (UAVs), cruise missiles, and ballistic missiles at their terminal stages. It is the fourth generation of long-range Russian SAMs, which China, India, and Turkey also operate. In October 2020, Russia’s then-ambassador to Iran said his country would have “no problem” selling Tehran an advanced air defense system when the UN arms embargo on the Islamic Republic is lifted. At the time, the Russian Ambassador Levan Dzagharyan told an Iranian publication, “As you know, we have provided Iran with S-300. Russia has no problem delivering S-400 to Iran, and it did not have any problem before either.” A Pentagon report titled Iran Military Power in 2020 said that Iran would try to rebuild its military by purchasing arms from Russia.

“Iran has also shown interest in acquiring S-400 air defense systems and Bastian coastal defense systems from Russia,” the report said. However, Iran has iterated that it does not need the Russian S-400 air defense systems, thanks to its domestic capabilities. In August 2021, Iran’s Tasnim News Agency reported that the country was going to unveil its most advanced and indigenously developed air defense system that would outdo the capability of the Russian S-400. Named Bavar-373, the system is reportedly a long-range air defense system capable of detecting up to 100 targets, tracking 60 of them, and engaging with six concurrently. However, given the strengthening relationship between Moscow and Tehran, the speculations among Western officials have grown manifold.

A Full Fledged Defense Partnership

According to the US, Moscow has reportedly been providing Iran with various weaponry assets, including unidentified helicopters, air defense systems, and other support, such as the Su-35 training jet. As part of this military trading between the two sanction-hit countries, the Russian government allegedly wants to acquire additional kamikaze drones and hundreds of Iranian short-range ballistic missiles. Additionally, Moscow intends to collaborate with Iran on weapons development, with one potential joint venture being establishing a drone manufacturing facility in Russia. John Kirby said that US intelligence assessments supported the latest allegations and that Russia gave Iran unprecedented military and technological support, transforming their relationship into a full-fledged defense partnership.

Moscow and Tehran had secretly agreed to start producing Shahed-136 kamikaze drones using Iranian designs on Russian soil. However, with Russia’s supply running low and the start of production still months away, Iran has promised in recent weeks to significantly increase its supply of unmanned aerial vehicles to Moscow for the conflict in Ukraine, according to the US and its allies’ officials. At least two talks between military and diplomatic representatives from Russia and Iran took place in November. According to reports, Iran had committed to providing up to 6,000 aircraft, predominantly Shahed, according to a senior military officer briefed on the nature of the talks. Iran had also acknowledged that it would be shipping its ballistic missiles to Moscow.

Against that backdrop, Western officials fear Iran would get Russia to sell some cutting-edge equipment to Tehran. As previously reported by EurAsian Times, a potential sale of a Su-35E fighter jet has unnerved the West. However, there has been no official acknowledgment of such a sale by either side yet. That being said, the Russian defense industry is currently reeling under tough sanctions. Half the world is unwilling to buy military equipment due to the ongoing war and the burgeoning Western pressure. Therefore, a deal with Iran for high-end military equipment could be on the cards.

<https://eurasianimes.com/us-fears-russia-could-sell-its-most-advanced-s-400-air-defense-system/>



Wed, 14 Dec 2022

US, S Korea, Japan to Curb Illicit N Korea Cyber Activities

Senior diplomats from the United States, South Korea and Japan agreed Tuesday to boost efforts to curb North Korea's illicit cyber activities and other methods to finance its nuclear programme and evade international sanctions. Meeting in Indonesia's capital, the three envoys in charge of North Korea's nuclear programme also agreed to strengthen their trilateral security cooperation in the face of North Korea's advancing nuclear and missile arsenals. In his opening remarks, Sung Kim, the US envoy who also serves as Washington's ambassador in Jakarta, said that North Korea's provocative run of missile tests this year has proven yet again that the North “presents one of the most serious security challenges in the region and beyond.” Calling North Korean threats “a global issue,” Sung Kim said the challenges posed by North Korea can only be addressed when the international community stands together and speaks with one voice.

After the meeting, South Korea's Foreign Ministry said in a statement that the three envoys decided to “double down their efforts to block North Korea's financing of nuclear and missile programmes via cyber activities and other means and its attempt to evade sanctions on the North.” North Korea has been under 11 rounds of United Nations sanctions imposed over its repeated nuclear and missile tests since 2006. South Korean officials said recently that North Korea has been turning to cybercrime and covert ship-to-ship transfers of unauthorised goods as a way to violate those UN sanctions. In recent months, North Korea test-fired dozens of missiles, including powerful ballistic weapons that flew over Japan and demonstrated a potential to reach the American mainland. But the UN Security Council has failed to adopt fresh sanctions on North Korea because of opposition from China and Russia, two veto-wielding members that are locked in confrontations with the United States.

Kim Gunn, the South Korean envoy, said North Korea's nuclear ambitions would only undermine its own security, prolong its diplomatic isolation and worsen its economic hardships. He expressed hopes that North Korea would return to denuclearisation talks while repeating a demand for China, the North's last major ally and economic pipeline, to play a constructive role to help resolve the North Korean nuclear issue. Takehiro Funakoshi, the Japanese envoy, said that North Korea's recent intercontinental ballistic missile test prompted Tokyo to increase its defence budget. “We will examine all options, including counter-strike capabilities,” Funakoshi

said. He said that Japan will be more vigilant against malicious cyber activities by North Korea though it remains committed to seeking dialogue with the North.

<https://www.dailypioneer.com/2022/world/us--s-korea--japan-to-curb-illicit-n-korea-cyber-activities.html>

THE TIMES OF INDIA

Tue, 13 Dec 2022

US Plans to Send Patriot Missiles to Ukraine

The United States is finalizing plans to send the missile defense system to Ukraine, a decision that could be announced as soon as this week, three US officials told Reuters on Tuesday. Ukraine has asked its Western partners for air defenses, including US-made Patriot systems, to protect it from heavy Russian missile bombardment including against its energy infrastructure. Ground-based air defense systems such as Raytheon Technology Corp's Patriot are built to intercept incoming missiles. The Patriot is considered to be one of the most advanced US air defense systems and is usually in short supply, with allies around the world vying for it.

It's very, very significant," said Alexander Vindman, a retired Army lieutenant colonel who led Ukraine policy at the White House during the Trump administration. "These are going to be quite capable of dealing with a lot of different challenges the Ukrainians have, especially if the Russians bring in short-range ballistic missiles" from Iran. Two of the officials, speaking on condition of anonymity, said the announcement could come as early as Thursday but was awaiting formal approval from US Defense Secretary Lloyd Austin and President Joe Biden. The Pentagon declined comment on reports about the Patriot system at a news briefing. There was no immediate comment from Ukrainian officials, but Kyiv held high-level military talks on Tuesday with Washington, Ukraine President Volodymyr Zelenskiy's office said. One of the officials said Ukrainian forces would likely be trained in Germany before the Patriot equipment was sent to Ukraine. Vindman said the training could take several months. Details such as the version of the Patriot missile defense system, its range or how many units would be sent were not immediately available. It was unclear if the United States would limit how the Ukrainians employ the Patriot system. Washington has restricted use of High Mobility Artillery Rocket System (HIMARS) launchers to targets inside Ukraine.

Russia warning

Former Russian President Dmitry Medvedev has warned NATO against providing Ukraine with Patriot missile defenses, and it is likely Moscow will view the move as an escalation. The Pentagon says Russia's recent surge in missile strikes in Ukraine is partly designed to exhaust Kyiv's supplies of air defenses so it can dominate the skies above the country.

For that reason, the United States and its allies have been delivering more air defenses for Kyiv, providing everything from Soviet-era systems to more modern, Western ones. For the United States, this has included NASAMS air defense systems that the Pentagon says have flawlessly intercepted Russian missiles in Ukraine. Milley, chairman of the Joint Chiefs of Staff, publicly raised the possibility of NATO allies sending Patriot systems to Ukraine in October. The Patriot

system is usually used against more advanced threats including aircraft, cruise missiles and ballistic missiles and typically includes launchers along with radar and other support vehicles. The United States has provided Ukraine with \$19.3 billion in military assistance since Russia's invasion of Ukraine started on February 24.

<https://timesofindia.indiatimes.com/world/us/us-plans-to-send-patriot-missiles-to-ukraine/articleshow/96212730.cms>

DefenseNews

Tue, 13 Dec 2022

Slovakia Readies Transfer of Upgraded MiG-29 Warplanes to Ukraine

In a potentially major reinforcement of Ukraine's air combat capability, Slovakia's Foreign and European Affairs Minister Radoslav Káčer has announced his country is preparing to transfer Soviet-made Mikoyan MiG-29 fighter jets to the Ukrainian Air Force in coordination with the United States. "We have not yet handed [Ukraine] the MiG-29s. But we are ready to do it. We are talking with our NATO partners about how to do it," Káčer told local news agency Interfax Ukraine. "And ... we had a very meaningful conversation with [Ukraine's] president. My defense minister explained to [the Ukrainian] president how we can do this. And I think that, in the coming weeks, a Ukrainian delegation will come to Slovakia, and we will work together with our American friends to make this reality."

In total, Slovakia secured 24 single-seater and twin-seater MiG-29s following Czechoslovakia's dissolution, according to data from the country's Defence Ministry. Of these, the 11 remaining operational fighter jets were withdrawn from service last August. "The MiG-29s were upgraded in the years 2004-2006, including with NATO-compatible communication and navigation systems," the Defence Ministry said in a statement. "Slovakia's 11 remaining MiG-29s will reach the projected end of service life between 2029-2035." Káčer's statement indicates Slovakia is in talks with the U.S. over the best way in which the jets could be transferred to Ukraine. This suggests Bratislava intends to avoid a similar situation to that from earlier this year when Poland unveiled plans to transfer its MiG-29s to the Ukrainian Air Force. However, the initiative was derailed after Polish and U.S. officials engaged in a public discussion over Washington's potential role in the procurement.

Poland offered to transfer the fighters to the United States which could then handle their delivery to Ukraine, but eventually the two allies failed to reach an agreement. The Slovak Air Force is awaiting the delivery of 14 F-16 Block 70/72 fighters that are to safeguard the country's airspace. Deliveries are expected to begin in 2024. In the meantime, the Czech and Polish air forces are policing Slovak skies until at least Dec. 31, 2023.

<https://www.defensenews.com/global/europe/2022/12/13/slovakia-readies-transfer-of-upgraded-mig-29-warplanes-to-ukraine/>

See the Weapons on Display at Vietnam's First Defense Expo

Vietnam showed off its upgraded Cold War-era, Soviet-made air defense systems at its first defense expo, improving their capabilities against modern threats such as cruise missiles and drones. An upgraded ZSU-23-4M Shilka tracked, self-propelled anti-aircraft gun and S-125 Pechora-2M medium-range surface-to-air missiles were on static display during the Vietnam International Defence Expo, which took place Dec. 8-10 at Gia Lam Airport in the capital Hanoi. The upgraded ZSU-23-4M featured an electro-optical system fitted with a laser rangefinder. It also included daylight and thermal cameras capable of automatic target tracking in lieu of its turret mounted RPK-2 Tobol fire-control radar (NATO designation Gun Dish) for its quadruple 23mm autocannons.

The tracking system is linked to a new digital fire-control system made by state-owned defense company Viettel, which says the technology enables the tracking of aircraft up to a range of 20 kilometers (12 miles) and allows the engagement of low-altitude targets. It is also fitted with four Russian-made Igla short-range surface-to-air missiles, increasing the engagement range from 2,500 meters to 5,500 meters, and at target altitudes of up to 3,500 meters (an increase from 1,500 meters). The four-year upgrade program began in 2014, although not all of Vietnam's ZSU-23-4Ms received upgrades, with a video of an air defense exercise in 2021 showing the radar-equipped vehicles still in service.

The Pechora-2M system on display at VIDEX was mounted on a fixed launcher with four missiles. Vietnam upgraded its missiles with assistance from Belarus and Russia in the early-2010s to the Pechora-2M standard. The Southeast Asian nation says the upgraded missiles can be used to engage cruise missiles. Other improvements to the missiles reportedly include shorter engagement times, improved performance against electronic jamming and improved kill probability. The original S-125 and ZSU-23-4 were first introduced by the Soviet Union in the 1960s, with the former used in the Vietnam War against American jets. Vietnam also currently operates newer Russian air defense systems such as the S-300 surface-to-air missile.

The country has also started looking beyond its traditional Russian suppliers in recent years, having acquired air defense systems from Israel that saw the introduction of the short- and medium-range Spyder surface-to-air missiles. Vietnam has reportedly expressed interest in the Barak 8 system, made by Israel Aerospace Industries.

<https://www.defensenews.com/industry/techwatch/2022/12/12/see-the-weapons-on-display-at-vietnams-first-defense-expo/>



Tue, 13 Dec 2022

UK Signs Plan for Defence Cooperation with Saudi Arabia

The Secretary of State for Defence, the Rt Hon Ben Wallace MP, met His Royal Highness Prince Khalid bin Salman, the Minister for Defence of the Kingdom of Saudi Arabia, in London today (13 December 2022). The Defence Ministers reflected on the strength of the historic UK-Saudi defence partnership of over half a century, based on a shared commitment to peace, stability, and the strengthening of mutual and regional security. The Defence Secretary and His Royal Highness welcomed the signing of a Plan for Defence Cooperation which will enhance bilateral defence and security cooperation to address shared security challenges, including through regular dialogue and consultation, education and training, and capability-building. It reaffirms the UK's enduring commitment to working with the Kingdom of Saudi Arabia on promoting regional security and stability.

Defence Secretary Ben Wallace said:

It is a pleasure to sign this Plan for Defence Cooperation, bringing us even closer to one of our most important partners. It is a key milestone between our two nations, as we look to enhance our defence partnership further in support of mutual and regional security.

<https://www.gov.uk/government/news/uk-signs-plan-for-defence-cooperation-with-saudi-arabia>



Tue, 13 Dec 2022

The NATO Military Committee Visits the NATO Communications and Information Agency (NCI Agency)

The NATO Military Committee visited the NATO Communications and Information Agency (NCI Agency) in The Hague, Netherlands. During the visit, the Military Committee were briefed on current and future NCI Agency work and challenges. Welcomed by the NCI Agency General Manager, Mr. Ludwig Decamps, and the Chief of Staff, Major General Hans Folmer, the Military Committee received briefings on NCI Agency's latest projects. "The speed of technological change has never been higher, and delivery for today must be adaptable to ensure success for tomorrow. Thus, it is crucial that NATO's armed forces are able to communicate at the speed of relevance. The NCI Agency is able to provide this support due to the continued commitment and partnership with the Military Committee, Military Representatives and Nations who fill key military positions in the Agency. Together we are maintaining NATO's technological edge," said the General Manager of the NCI Agency Mr. Decamps.

During his opening remarks, the Chair of the Military Committee stated, "The NCI Agency is a strategic asset for the Alliance. With digital transformation being at the heart of tomorrow's

warfare, NCI Agency experts are critical to NATO and ensuring it can fulfil its core tasks of deterrence and defence; crisis prevention and management; and cooperative security”.The NCI Agency is assisting with the execution of the Concept for the Deterrence and Defence of the Euro-Atlantic Area and the NATO Warfighting Capstone Concept, the two key military strategies ensuring the Alliance is ready not only for today, but tomorrow’s challenges. The concepts place greater importance on interoperability, accelerated decision-making, and cross and multi domain operations. These areas are all enabled and underpinned by technological solutions. Admiral Bauer stressed during the visit, “The warfare of tomorrow will be a fusion of modern and traditional warfighting. It will be as much about mud and blood as it will be about bits, bytes, and bots. The Alliance needs to be ready to counter it all, while maintaining a decisive military advantage.”

The NCI Agency supports NATO by providing the systems, services and expertise to ensure that the Alliance can work together to safeguard peace and security for nearly 1 billion citizens. Amongst other things, it defends NATO networks 24/7, provides critical technology for air command and control and ballistic missile defence, and helps NATO explore emerging technologies like Artificial Intelligence and Space innovation.

https://www.nato.int/cps/en/natolive/news_210058.htm?selectedLocale=en

Science & Technology News



Tue, 13 Dec 2022

Scientists Reveal 3 Keys to Keeping Your Brain Healthy

Your brain is really rather amazing. Around 100 billion nerve cells collaborate to keep you nimble and quick-thinking. However, like with the rest of the body, as you age your brain may not be nearly as sharp. You may need to write things down, miss appointments, or have trouble watching TV without straining to understand the dialogue or action. Fortunately, you can also exercise your brain. “The keys to our nervous system are the grey and white matter,” says Hermundur Sigmundsson, a professor at the Norwegian University of Science and Technology’s (NTNU) Department of Psychology.

Generally speaking, the white matter provides the contacts between the cells (myelinated axons) and contributes to the transmission speed and distribution of the signals, whilst the grey matter is made up of the nerve cells, or neurons, and dendrites.

Three factors contribute to good brain health

A new study in the journal *Brain Sciences* brings together a lot of what we know from prior studies on the subject of brain health. The researchers went to great measures to include 101

references to studies on how to maintain the health of our grey and white matter in their theoretical perspective paper. “Three factors stand out if you want to keep your brain at its best,” says Sigmundsson.

These factors are:

- Physical exercise.
- Being social.
- Having strong interests. Learn new things and don’t hold back from new challenges.

1. Motion

This is probably the biggest challenge for many of us. Your body gets lazy if you sit on your bum too much. Unfortunately, the same is true for the brain too. “An active lifestyle helps to develop the central nervous system and to counteract the aging of the brain,” according to Sigmundsson and his colleagues. So it’s important not to get stuck in your chair. This requires effort, and there’s no way around it. If you have a sedentary job, go to school or when you’re done work, you need to activate yourself, including physically.

2. Relationships

Some of us are happiest alone or with just a few people, and we know that “hell is other people” – if we translate writer-philosopher Jean-Paul Sartre’s phrase a little loosely. (Although his version was admittedly somewhat more involved.) But in this regard, you have to steel yourself. “Relationships with other people, and interacting with them, contribute to a number of complex biological factors that can prevent the brain from slowing down,” says Sigmundsson. Being with other people, such as through conversation or physical contact, supports good brain function.

3. Passion

This last point may have something to do with your personality, but if you’ve read this far, chances are good that you already have the necessary foundation and are probably willing to learn. “Passion, or having a strong interest in something, can be the decisive, driving factor that leads us to learn new things. Over time, this impacts the development and maintenance of our neural networks,” Sigmundsson says.

Stay curious.

Don’t give up and just let everything run its course the same way all the time. You’re never too old to do something you’ve never done before. Maybe now is the time to learn to play a new musical instrument.

Use it or lose it

Sigmundsson collaborated with master’s student Benjamin H. Dybendal and associate professor Simone Grassini at the University of Stavanger on the comprehensive paper. Their research thus presents a similar picture for the brain as for the body. You have to exercise your brain so that it doesn’t decay. “Use it or lose it,” as the saying goes. “Brain development is closely linked to lifestyle. Physical exercise, relationships, and passion help to develop and maintain the basic structures of our brain as we get older,” says Sigmundsson. These three factors thus offer some of the keys to maintaining a good quality of life – and hopefully – aging well.

<https://scitechdaily.com/scientists-reveal-3-keys-to-keeping-your-brain-healthy/>

NASA Keen on Sharing its Expertise with ISRO for Gaganyaan

The National Aeronautics and Space Administration (NASA) is looking forward to sharing data and expertise with the Indian Space Research Organisation (ISRO) for India's upcoming Gaganyaan, human space flight programme. Kathryn Lueders, Associate Administrator, Space Operations Mission Directorate (SOMD) at NASA told reporters here on Tuesday after delivering a talk on Future of Human Space Exploration, that the US space agency will share its experience in the human space flight regime. "One of the reasons I am here is to establish and build on the NASA-ISRO Human Space Flight Working Group. Right now we are just working on exchange of data, we can share any experience we have in the human space flight regime. But part of the next step is for us to identify what may be ways for us to share training protocols and our data that we both get from human space flight perspective," said Ms. Lueders.

She added that NASA was looking forward to the next bi-annual meet between the two space agencies in February next year. "One of the things which we really are trying to do is to look at what are the next concrete steps that we can work together from human space flight perspective and other potential collaborations across the board. We have these two space-faring nations and we really feel like it's important for us to be working together," she added. According to ISRO, the Gaganyaan project envisages demonstration of human spaceflight capability by launching a crew of three members to an orbit of 400 km for a 3-day mission and bringing them back safely to earth, by landing in Indian sea waters.

The first trial (uncrewed flight) for Gaganyaan is being planned by the end of 2023 or early 2024. This will be followed by sending Vyom Mitra, a humanoid and then with the crew onboard. The two space agencies are also working on the NASA-ISRO SAR (NISAR) Mission which will measure the Earth's changing ecosystems, dynamic surfaces, and ice masses providing information about biomass, natural hazards, sea level rise, and groundwater.

<https://www.thehindu.com/news/national/karnataka/nasa-keen-on-sharing-its-expertise-with-isro-for-gaganyaan/article66258966.ece>

THE TIMES OF INDIA

How Fusion Breakthrough at US Lab can Clean Up Our Air

Development of a nuclear fusion reactor is the Holy Grail of clean energy that scientists have been striving to find for decades. So reports about scientists at California-based Lawrence Livermore National Laboratory (LLNL) achieving a "net energy gain" from an experimental fusion reactor signal a game changer. That's because, for the first time, a fusion reaction has produced more energy than it consumes.

What exactly is this breakthrough?

Fission and fusion are two different types of nuclear reactions that produce energy. Fission-based power plants have been around since the 1950s, and India has several of its own. But scientists have been working for years to develop a reactor based on nuclear fusion, which is touted as a clean, abundant and safe source of energy that could eventually allow humanity to break its dependence on fossil fuels that are driving a global climate crisis. Fusion is the same nuclear process that powers the Sun and other stars. It essentially involves two atoms joining or “fusing” together to form an atom of a heavier element. For example, inside the Sun two hydrogen atoms fuse to form one helium atom. The latest discovery shows that it might eventually be possible to replicate this process in a commercial power plant.

How is fusion better than fission?

Both fission and fusion use the binding energy of protons and neutrons in the nuclei of atoms to release an enormous amount of energy. The main difference between them is that fission is the splitting of a heavy and unstable nucleus into two smaller nuclei while fusion involves joining two light nuclei together.

A nuclear fission reactor uses uranium, which is not commonly found, as fuel. When a uranium atom becomes excited and unstable with exposure to neutron radiation, it splits into smaller atoms of elements like barium and krypton, and releases more neutron radiation, which, in turn, excites and breaks apart more uranium atoms, causing a chain reaction. The energy that is released is used to boil water to produce steam and run turbines for producing electricity. The biggest problem with fission is that some of its byproducts remain radioactive for tens of thousands of years, and have to be disposed of in special facilities. Also, reactor accidents can release radioactive material into the environment, as happened at Three Mile Island in 1979 and at Chernobyl in 1986.

Nevertheless, nuclear fission now provides about 10% of the world’s electricity from about 440 reactors, as per worldnuclear.org. Over 50 countries use nuclear energy in about 220 research reactors that are also used to make medical and industrial isotopes. With 92 reactors, the US is the world’s largest producer of nuclear power, accounting for over 30% of global nuclear generation of electricity. Fusion scores over fission because it can yield several times more energy without producing highly radioactive byproducts. But so far, fusion reactions in the lab have been difficult to sustain because of the tremendous pressure and temperature needed to fuse nuclei together. A fusion reaction consumes vast amounts of energy because it occurs at temperatures of 100 million degrees Celsius or higher. The only way to make it self-sustaining is to get more energy out than goes in, and to do so continuously instead of for brief moments. Once fusion is commercialised, we would have virtually carbon-free electricity without any radioactive byproducts. It will help in the fight against climate change. Secondly, because nuclear fusion reactors require only universally abundant hydrogen, they could be set up anywhere – unlike fission reactors that require rare radioactive substances like uranium.

Can’t it occur at normal temperatures?

Like the Sun and the stars, the fusion experiment at LLNL used “hot” fusion, employing ultra-high temperatures. However, some scientists have theorised that ‘cold’ fusion is possible at or near room temperature. In 1989, electrochemists Martin Fleischmann and Stanley Pons reported that their apparatus had produced anomalous heat (excess heat) of a magnitude that was only

possible through a nuclear process. They also reported measuring small amounts of nuclear reaction byproducts, including neutrons and tritium. Their small tabletop experiment involved electrolysis of heavy water – water made up of heavier hydrogen atoms – on the surface of a palladium electrode. While their reported results raised hopes of a cheap and abundant source of energy, they could not be replicated.

It could be real in 10 years

Fusion technology has drawn billions in investments from backers, including Jeff Bezos, Bill Gates and . In recent years it has also won support from sovereign wealth funds, national development banks and venture capitalists. Fusion attracted \$2.8 billion over the past year, compared with around \$2 billion over the previous decade. The Fusion Industry Association said more than 93% of companies that responded to its survey believe fusion power will be feeding electricity into power grids by the 2030s.

<https://timesofindia.indiatimes.com/home/science/how-fusion-breakthrough-at-us-lab-can-clean-up-our-air/articleshow/96211381.cms>



बुधवार, 14 दिसंबर 2022

14 दिसंबर की रात हर घंटे आसमान से गिरेंगे 120 उल्कापिंड, ऐसे देख सकते हैं ये खूबसूरत नजारा

14 दिसंबर 2022 को साल में एक बार होने वाली अद्भुत आकाशीय घटना होने वाली है. हर घंटे 120 उल्कापिंडों की बारिश होगी. इसे जेमिनिड मेटियोर शॉवर (Geminid Meteor Shower) कहते हैं. भारत में लोग इसे शाम साढ़े छह बजे के बाद देख सकते हैं. अगर आसमान साफ रहेगा तो आपको आसमानी आतिशबाजी देखने को मिलेगी! बेहतरीन नजारा शाम को अंधेरा होने के बाद ही देखने को मिलेगा. जेमिनिड उल्कापिंडों की बारिश 4 दिसंबर 2022 से शुरू हुई है. यह 17 दिसंबर को खत्म हो जाएगी इस पूरे समय में आसमान में उल्कापिंडों की बारिश होती दिखेगी. लेकिन 14 दिसंबर की रात यह ज्यादा तीव्र और सबसे अधिक खूबसूरत होगी. यह उल्कापिंड जेमिनी नक्षत्र से आ रहे हैं.

आपको यह खूबसूरत नजारा 14 दिसंबर की देर रात तक देखने को मिल सकता है. यानी ठंडी के बेहतरीन कपड़े पहनकर चाय-वाय लेकर आप छत या बालकनी पर बैठकर इस आकाशीय घटना का मजा ले सकते हैं. जैसे-जैसे धरती घूमती जाएगी, उल्कापिंडों की बारिश दूसरे देशों को दिखती जाएगी. आपकी आंखों से ओझल होती चली जाएगी. दिन में भी बारिश हो रही है लेकिन सूरज की रोशनी में यह दिखती नहीं है. आसमान जितना ज्यादा साफ होगा. अंधेरे वाला होगा... उल्कापिंडों की ये बारिश अत्यधिक स्पष्ट दिखाई देगी. हालांकि आप अपने टेलिस्कोप या दूरबीन का भी इस्तेमाल कर सकते हैं. उल्कापिंडों की

बारिश तब दिखाई देती है, जब पृथ्वी सूरज की उस कक्षा में पहुंचती है, जहां पर उल्कापिंडों की बड़ी बेल्ट है। ये उल्कापिंड जब पृथ्वी के गुरुत्वाकर्षण शक्ति की वजह से हमारे वायुमंडल में प्रवेश करते हैं, तो ये जलते हुए दिखाई देते हैं। ऐसे लगता है कि आसमानी बारिश हो रही है।

जेमिनिड उल्कापिंडों की बारिश पथरीले धूमकेतु 3200 फ़ैथॉन (3200 Phaethon) के पीछे छोटे हुए पत्थरों के टुकड़े हैं। यह धूमकेतु 5.8 किलोमीटर का बेहद बड़ा आसमानी पत्थर है। जब यह सूरज के करीब से गुजरता है तब इसके टुकड़े तेजी से पीछे निकलते जाते हैं। अंतरिक्ष में उल्कापिंडों के रूप में बनते चले जाते हैं। पृथ्वी जब इनके करीब से निकलती है तो ये आसमानी बारिश करते हैं। फ़ैथॉन से निकलने वाले पत्थर 1.27 लाख किलोमीटर प्रतिघंटा की गति से धरती के वायुमंडल में प्रवेश करते हैं।

<https://www.aajtak.in/science/story/geminid-meteor-shower-on-december-14-how-to-watch-it-tstr-1594335-2022-12-13>

