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Press Information Bureau
Government of India

Ministry of Defence

Mon, 25 Jul 2022 3:20 PM

Self Reliance in Defence Manufacturing

The Government has taken several policy initiatives in the past few years and brought in reforms to encourage indigenous design, development and manufacture of defence equipment in the country, thereby expanding the production of indigenous defence equipment. These initiatives, inter-alia, include according priority to procurement of capital items from domestic sources under Defence Acquisition Procedure (DAP)-2020; Announcement of 18 major defence platforms for industry led design & development in March 2022; Notification of three 'Positive Indigenisation Lists' of total 310 items of Services and two 'Positive Indigenisation Lists' of total 2958 items of Defence Public Sector Undertakings (DPSUs) for which there would be an embargo on the import beyond the timelines indicated against them; Simplification of Industrial licensing process with longer validity period; Liberalization of Foreign Direct Investment (FDI) policy allowing 74% FDI under automatic route; Simplification of Make Procedure; Launch of Innovations for Defence Excellence (iDEX) scheme involving start-ups & Micro, Small and Medium Enterprises (MSMEs); Implementation of Public Procurement (Preference to Make in India) Order 2017; Launch of an indigenization portal namely SRIJAN to facilitate indigenization by Indian Industry including MSMEs; Reforms in Offset policy with thrust on attracting investment and Transfer of Technology for Defence Manufacturing by assigning higher multipliers; and Establishment of two Defence Industrial Corridors, one each in Uttar Pradesh and Tamil Nadu; Opening up of Defence Research & Development (R&D) for industry, start-ups and academia with 25% of defence R&D budget earmarked to promote development of defence technology in the country; Progressive increase in allocation of Defence Budget of military modernization for procurement from domestic sources, etc.

With these actions of the Government, the expenditure on defence procurement from foreign sources which used to be 46% of the overall expenditure has reduced to 36% in the last four years i.e. 2018-19 to 2021-22. This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Shri Vijay Pal Singh Tomar in Rajya Sabha today.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1844608>



**Press Information Bureau
Government of India**

Ministry of Defence

Mon, 25 Jul 2022 3:22 PM

FDI in Defence Sector

The Government vide Press Note No. 4(2020 Series) dated 17.09.2020, has liberalised and allowed FDI under automatic route up to 74% and up to 100% through Government route wherever it is likely to result in access to modern technology. Since the notification of revised FDI policy, the total FDI inflow reported till May, 2022 is approximately Rs. 494 Crores. The Department of Defence Production (DDP) has brought in number of Policy reforms for attracting investment:

- Higher multipliers assigned in Offset Policy to attract investment and Transfer of Technology for Defence manufacturing.
- Specific consultations are done regularly with Foreign Original Equipment Manufacturers (FOEMs).
- Two Defence Corridors have been established; one in Tamil Nadu and another in Uttar Pradesh which provide Plug & Play support to the industries including FOEMs in the Corridor. Under the Aerospace & Defence Policy notified by the two State Governments, Customized incentive packages are provided to investors based on investment, employment and project location which may include GST based refunds on sales, Stamp duty concessions on land allotment, Electricity Tax exemption, Capital subsidy and Training subsidy for training workers.
- Webinars are conducted with Friendly Foreign Countries (FFCs) under the aegis of DDP, Ministry of Defence (MoD) through Indian Missions abroad and Industry Associations with active participation from Indian Defence Industries. Webinars have been conducted with 27 FFCs till date.
- Defence Investor Cell has been created to provide all necessary information including addressing queries related to investment opportunities, procedures and regulatory requirements for investment in the sector. 1,445 queries have been addressed by the Cell till date.

This information was given by Raksha Rajya Mantri Shri Ajay Bhatt in a written reply to Shri K R Suresh Reddy in Rajya Sabha today.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1844610>

Tata Advanced Systems Successfully Delivered Indigenously Developed Quick Reaction Fighting Vehicle to Indian Army

Tata Advanced Systems Limited (TASL) successfully delivered the indigenously developed Quick Reaction Fighting Vehicle-Medium (QRFV) to the Indian Army on Monday. "TASL has successfully delivered the QRFV to the Indian Army," the TASL tweeted. It further said that the induction of this vehicle will enhance the operational capabilities of the Indian Army in future conflicts. "The induction of this vehicle developed by TASL would greatly enhance the operational capabilities of the Indian Army in future conflicts," it added. Earlier in the day, Minister of Defence for Defence Ajay Bhatt said that the BJP-led government in Centre has taken several policy initiatives in the past few years and brought in reforms to encourage indigenous design, development and manufacture of defence equipment in the country, thereby expanding the production of indigenous defence equipment.

In a written reply to Rajya Sabha, the MoS said that the initiatives taken by the Centre for to encourage the production of indigenous defence equipment have resulted in cutting the the expenditure on defence procurement from foreign sources from 46 percent of the overall expenditure to 36 percent in the last four years -- 2018-19 to 2021-22. In April, Chief of Army Staff General MM Naravane had inducted the first set of QRFV. As per a defence release, the Army Chief had inducted the QRFV, Infantry Protected Mobility Vehicle (IPMV), Ultra Long Range Observation System developed by TASL and Monocoque Hull Multi-Role Mine-Protected Armoured Vehicle developed by Bharat Forge.

<https://www.timesnownews.com/india/tata-advanced-systems-successfully-delivered-indigenously-developed-quick-reaction-fighting-vehicle-to-indian-army-article-93110988#:~:text=New%20Delhi:%20Tata%20Advanced%20Systems,Army,%E2%80%9D%20the%20TASL%20tweeted.>



सोमवार, 25 जुलाई 2022

भारत के S-400 डिफेंस मिसाइल सिस्टम के आगे कहीं नहीं टिकता पाक का HQ-9, जानिए S-400 की ताकत

भारत के अपने पड़ोसी देश चीन और पाकिस्तान के साथ रिश्ते तनावपूर्ण रहे हैं. भारत के न चाहते हुए भी चीन और पाकिस्तान की ओर से उकसावे वाली गतिविधियां होती रहती हैं. हाल के दिनों में चीन की ओर से पूर्वी लद्दाख में एलएसी (LAC) के पास फाइटर जेट उड़ाने के मामले सामने आए हैं. ऐसे में भारत भी चीनी

लड़ाकू विमानों की गतिविधियों पर पैनी नजर बनाए हैं. चीन अक्सर अपने स्वार्थ को लेकर पाकिस्तान की मदद करता रहा है. चीन ने पाकिस्तान (Pakistan) को स्वदेशी तकनीक पर विकसीत एयर डिफेंस सिस्टम HQ-9 दिया था. हालांकि ये भारत के एस-400 एयर डिफेंस मिसाइल सिस्टम (S-400 Defence System) के आगे कहीं नहीं टिकता है.

पाकिस्तान ने HQ-9 मिसाइल सिस्टम को चीन से लिया है. चीन के पास HQ-9 मिसाइल सिस्टम के कई वैरियंट मौजूद हैं. इसकी अधिकतम रेंज 100 किमी से 300 किमी के बीच है. वहीं, भारत में जो एस-400 एयर डिफेंस मिसाइल सिस्टम है वो रूसी कवच है और ये काफी ताकतवर है.

HQ-9 डिफेंस सिस्टम किसने बनाया?

पाकिस्तान में जो HQ-9 एयर डिफेंस सिस्टम मौजूद है, उसे चीन ने निर्माण किया था. इसकी शुरुआत ड्रैगन ने साल 2001 से की थी, जबकि भारत के S-400 डिफेंस मिसाइल सिस्टम की शुरुआत साल 2007 में हुई थी. हम कह सकते हैं कि रूस का एयर डिफेंस सिस्टम काफी आधुनिक है. स्टॉकहोम इंटरनेशनल पीस रिसर्च इंस्टीट्यूट के मुताबिक भी भारत में मौजूद रूसी कवच यानी S-400 दुनिया का सबसे एडवांस्ड एयर डिफेंस सिस्टम है.

S-400 के आगे कहीं नहीं टिकता HQ-9

रूस से भारत को मिलने वाली एस-400 मिसाइल डिफेंस सिस्टम काफी ही ताकतवर है. पहली फायरिंग यूनिट को पहले ही शामिल किया जा चुका है और जल्द ही इसकी सभी डिलीवरी पूरी होने की उम्मीद है. S-400 को रूस का सबसे एडवांस वर्जन माना जाता है. ये 600 किमी तक की रेंज में ट्रैकिंग करने में सक्षम है. इसमें फिट की गई मिसाइलें 400 किमी की दूरी में किसी भी टारगेट को भेदने में सक्षम है. वहीं, पाकिस्तान में मौजूद चीनी HQ-9 मिसाइल सिस्टम की अधिकतम रेंज 100 से 300 किमी तक ही है.

HQ-9 डिफेंस सिस्टम

HQ-9 डिफेंस सिस्टम की ऑपरेशनल रेंज महज 120 किमी है. हालांकि इसके कुछ और वैरियंट हैं जिसकी रेंज 300 किमी तक है. ये हाई टू मीडियम एयर डिफेंस सिस्टम है. इसमें भी लंबी दूरी तक सर्फेस टू एयर मार करने वाली मिसाइलें लगी होती हैं. इसकी लंबाई करीब 6.8 मीटर है. वहीं, वजन की बात करें तो ये 2000 किलो तक है. ये हेलीकॉप्टर, गाइडेड बम और बैलिस्टिक मिसाइल जैसे कुछ खतरों में रोक सकता है. एक्सपर्ट का कहना है कि ये रूस से एस-300 और अमेरिका के एमआईएम-104 पैट्रियट मिसाइल सिस्टम की तकनीक पर विकसीत है. ये अधिकतम 4.2 मैक की स्पीड से उड़ान भरने में सक्षम है.

कितना ताकतवर S-400 डिफेंस सिस्टम?

भारत को मिले रूसी कवच यानी एस-400 एयर डिफेंस मिसाइल सिस्टम (S-400 Air Defence System) रूस (Russia) के ही एस-300 का अपग्रेडेड वर्जन है. ये एक ही राउंड में 36 वार करने की ताकत रखता है.

भारतीय सीमाओं पर भी इसे तैनात किया जा रहा है. ये सिस्टम किसी भी हवाई हमले का पता पहले ही लगा सकता है और सेना अलर्ट हो जाती है. S-400 के रडार काफी आधुनिक हैं. ये 100 से 300 टारगेट एक साथ ट्रैक करने में सक्षम हैं. 600 किमी तक रेंज में ट्रैकिंग को संभव कर सकता है. इसमें जो मिसाइलें लगाई गई हैं, वो 30 किमी की ऊंचाई और 400 किमी की दूरी में किसी टारगेट को भेदने में सक्षम है. इसमें 12 लांचर लगे होते हैं.

<https://www.abplive.com/news/india/defence-news-s-400-defence-system-more-powerfull-than-pakistan-chinese-made-hq-9-defence-system-2176035>

THE TIMES OF INDIA

Mon, 25 Jul 2022

India to Deploy 2nd S-400 Squadron at China Front as PLA Jets Buzz Near LAC

India's capability to detect and destroy hostile fighters, strategic bombers, missiles and drones at long ranges will get another major boost when a new squadron of the S-400 Triumf surface-to-air missile systems becomes operational along the northern borders with China in the next two to three months. Sources say deliveries of the second operational S-400 squadron through ships and aircraft are now underway from , the first since the Russia-Ukraine war erupted on February 24. The new S-400 deliveries come at a time when China has cranked up its air activity across eastern Ladakh, with Chinese fighters often flying close to the Line of Actual Control (LAC) in violation of the 10-km no-fly zone confidence building measure between the two sides. The first S-400 squadron, which was delivered through thousands of containers last December, is already deployed in northwest India to cater for aerial threats from both Pakistan and China. The IAF also got simulators and other equipment for a 'S400 training squadron' in April-May this year. The second operational S-400 squadron, in turn, will be positioned for air defence specifically on the China front.

Chinese fighter deployments and sorties have gone up along the 3,488-km LAC since mid-June, especially across Ladakh but also in other sectors like Arunachal Pradesh. There are often two-three Chinese fighter sorties near the LAC in a day," a source said. A Chinese jet had even flown over Indian troop positions at a friction point in eastern Ladakh on June 28, which led IAF to scramble its own jets and later raise the matter with China, amidst the over two-year-long military confrontation, as was reported by TOI.

China has systematically upgraded all its major air bases facing India like Hotan, Kashgar, Gargunsa and Shigatse, with extended runways, hardened shelters and fuel storage facilities for additional fighters, bombers and reconnaissance aircraft, over the last two years. It has also deployed two Russian-origin S-400 batteries and several other anti-aircraft systems to tackle any air strikes by India. Apart from matching the military deployments, India till now has also managed to stave off sanctions under the US law called CAATSA (Countering America's Adversaries through Sanctions Act), which seeks to prevent countries from buying Russian

weapons. India has scrapped a long-pending deal for 48 additional Mi17 V5 medium-lift helicopters as well as “deferred” the acquisition of 21 more MiG-29 and 12 Sukhoi-30MKI fighters from Russia. But India has told the US that the S-400 systems, the acquisition process for which began before CAATSA was enacted in 2017, are an “urgent national security requirement” to counter its hostile neighbours. The US, incidentally, had earlier slapped sanctions on China and Turkey for inducting S-400 systems. IAF is slated to get all the five operational squadrons of the highly-automated S400 systems, contracted under the \$5.43 billion (Rs 40,000 crore) contract with Russia in October 2018, by end-2023. Each squadron has two missile batteries with 128 missiles each, with interception ranges with interception ranges of 120, 200, 250 and 380-km, as well as long-range acquisition and engagement radars and all-terrain transporter-erector vehicles.

<https://timesofindia.indiatimes.com/india/india-to-deploy-2nd-s-400-squadron-at-china-front-as-pla-jets-buzz-near-lac/articleshow/93096672.cms>



Tue, 26 Jul 2022

China Continues its Aggression! Plans to Build G695 Highway through Aksai-Chin

China continues with its provocation, even after the recently concluded 16th round of Corps Commander talks which remained inconclusive. In an area which is considered to be of strategic importance to India, satellite images available in public domain have shown a fully functional village east of Doklam which is on Bhutan side. The talks last week took place to resolve almost two years of standoff between the armies of both countries in eastern Ladakh. The Chinese administration has plans to construct a new highway named ‘G695’. This highway will be passing through Aksai Chin, and this the area which India has been claiming for a long time. To further boost its strategic position in the disputed region, China has plans to construct the ‘G695’ highway which will connect Xinjiang and Tibet. “This means better connectivity in the region,” said sources in the Indian defence and security establishment.

This is the region where the armies of both countries were in a standoff which lasted for almost 73 days at the Doklam tri-junction in 2017. And at that time China was attempting to build a road inside the Bhutanese Territory. A report in the South China Post published from Hong Kong has indicated that this highway is expected to go through southern Tibet’s Cona County. This is located immediately north of the disputed India-Tibet border which has been demarcated by the Line of Actual Control (LAC). This is the region where the armies of both countries were in a standoff which lasted for almost 73 days at the Doklam tri-junction in 2017. And at that time China was attempting to build a road inside the Bhutanese Territory. In 2017, Indian Army troops had blocked the construction of a road by Chinese troops to Jhamperi ridge from Doklam plateau.

MEA says

Responding to media questions during the weekly briefing, MEA's official spokesperson Arindam Bagchi had said that a constant watch was being kept on all developments which have a bearing on national security. Adding, all necessary measures were taken to safeguard the country's interest. The belligerent administration of China has 345 construction plans which have been proposed in its new national programme. As per the Hong Kong-based South China Morning Post, by 2035, Xi-administration plans to construct around 461,000 km of highways and motorways. These will help in reviving its economy and also boost consumer spending through investment in infrastructure projects. Though there are no details of the construction of 'G695', experts believe that this highway could be very close to the existing friction points including the Depsang Plains, Hot Springs on the Line of actual Control (LAC) and Galwan Valley.

Has China built highways before?

Yes. In the 1950s, a national highway in the Aksai region 'G219' was built by China and today it controls around 38,000 sq km of land. This land India has been claiming as its own. In an effort to improve their efforts to improve logistics capabilities, both New Delhi and Beijing have stepped up infrastructure development along the LAC in eastern Ladakh. In recent years, India has managed to improve its border infrastructure and has been building new roads and tunnels which will help in faster movement of the military personnel and vehicles and also ease the life of the people in border villages.

<https://www.financialexpress.com/defence/china-continues-its-aggression-plans-to-build-g695-highway-through-aksai-chin/2605969/lite/>

ThePrint

Mon, 25 Jul 2022

China's Pressure Tactics along LAC Continue, Aim to 'Keep the Pot Simmering'

From Chinese fighter jets repeatedly violating agreements along the Line of Actual Control (LAC) — forcing the Indian Air Force (IAF) to scramble its own — to building a new highway that will connect all the current friction points and speed up deployment of new military equipment close to the borders, China is keeping up the pressure in the over two-year-long standoff with India. Sources in the defence and security establishment told ThePrint that the Chinese intent is to “keep the pot simmering” and not go in for any actual de-escalation as wanted by India. The ongoing provocation by the Chinese is being done through an air exercise under which their fighters and even drones are repeatedly violating the 10-km Confidence Building Measure (CBM) agreement between the two sides.

According to this agreement, both sides are to avoid their fighters from coming within a 10-km radius of the LAC. However, the provocation has continued. Sources said the violation was raised by the Indian side during the last Corps Commander level talks held on 17 July. They said the Chinese jets have flown within the agreed radius even after the talks. “There has not been any Indian airspace violation by the Chinese that has violated the local agreement. We are on alert

and take tactical steps whenever we notice something,” a source in the defence and security establishment said. Another key provocation by the Chinese is their plan to build a new highway near the LAC that will run through the disputed territory of Aksai Chin and the existing flashpoints in Eastern Ladakh.

Referred to as the G-695 national expressway, the highway is part of China’s newly unveiled national programme that aims to build 345 new infrastructure projects, totalling 4,61,000 km of highway and motorway, by 2035. The highway will give China another access point to quickly mobilise and move troops to forward locations at the LAC when required. It will also ensure smoother logistics management for the troops of the People’s Liberation Army (PLA) posted along the border. The tension isn’t just limited to the 1,597-km border in Ladakh but stretches to the Eastern Sector where the Chinese are busy building infrastructure, including villages, close to the LAC.

Chinese soldiers gaining experience

Speaking about the Chinese development, sources said that China is trying to counter its disadvantage in the Tibet region, in terms of its Air Force. They have spent the last two years building up the infrastructure at its bases close to the LAC, including the ones at Shigatse, HJotan, Kashgar among others. These bases have now got longer runways, hardened and underground shelters, besides deployment of a larger number of aircraft. Sources also said that China has been constantly inducting their latest series of armoured personnel carriers, artillery and air defence systems along the Line of Actual Control. The Chinese have also rolled out G5 connections on its side of the border to speed up their communication networks and are switching their surveillance equipment to this frequency.

“China is also carrying out faster rotation of troops. While we also do a planned rotation of troops, the Chinese also rotate their equipment unlike us,” a second source said. The sources said that Chinese have been focusing on building road infrastructure besides thousands of billets for its soldiers at multiple locations to ensure there can be faster deployment of men and equipment. “Faster rotation of troops is being done to ensure that a large number of soldiers get to experience the situation and learn. This will be beneficial for them in the long run because they are not used to such a situation,” a third source said.

<https://theprint.in/defence/chinas-pressure-tactics-along-lac-continue-aim-to-keep-the-pot-simmering/1054168/>

THE TIMES OF INDIA

Mon, 25 Jul 2022

Theatre of Reform: India Needs Joint Commands & it Needs a CDS. The Two are Linked, & Both are much-Delayed

Speaking in Jammu on Sunday, Rajnath Singh re-emphasised that joint theatre commands are a defence reform priority. But while GoI’s intent seems to be on track, little headway has been made so far. Arguments for theatre commands are known. Warfare is changing, and one modern response is joint commands that amalgamate manpower and resources of the three services. Arguments against are known, too. Currently, India has 17 single-service commands spread

across a wide geography. Converting them into joint theatre commands would require a radical change in the culture of armed forces. One of the theatrisation models under consideration involves the establishment of four new integrated commands – two land-centric commands, one air defence command and one maritime command – to optimise the military’s resources. But the air force had previously expressed reservations about splitting assets, arguing that of the 42 sanctioned combat squadrons, IAF operates with just about 30. And since air force assets have dual offensive and defensive roles, distribution among the prospective joint commands has to be done judiciously.

It is to iron out these issues that the Centre had formed an eight-member panel under then Chief of Defence Staff General Bipin Rawat in June 2021. And the deadline for submitting reports on finalising the new joint structures was April this year. But Gen Rawat’s death last December set back the entire process. And matters haven’t been helped by the CDS post lying vacant since then. Meanwhile, GoI’s other defence reform – the Agnipath scheme to recruit future soldiers, change the manpower profile of the armed forces, and cut down on the ballooning defence salary and pension bill – met with furious protests. The scheme is on, but its critics are still sceptical. GoI held its nerve as Agnipath protests roiled various cities. Hopefully, facing down young military aspirants hasn’t affected GoI’s determination to force through the theatre of command reform. India’s security challenges have become increasingly complex with the rise of the China-Pakistan axis. Add to this the strategic complications wrought by the Ukraine war. China in the last decade radically transformed its military by successfully implementing both rationalisation of manpower – PLA retrenched 3 lakh troops – and establishing five theatre commands. GoI has moved on the first step through Agnipath. It must now quickly appoint the next CDS and move full steam on theatrisation.

<https://timesofindia.indiatimes.com/blogs/toi-editorials/theatre-of-reform-india-needs-joint-commands-it-needs-a-cds-the-two-are-linked-both-are-much-delayed/>



Mon, 25 Jul 2022

France’s Aircraft Carrier Fighter Rafale-M Jet that Makes Russia Sweat

The Omnivorous “Omnirole” Fighter – “Flexibility is the key to airpower,” quoth the 20th century Italian airpower strategic Gen. Giulio Douhet (1869 – 1930), and this is a tenet that’s hammered into the heads of young aspiring U.S. Air Force officers early on during their training phases as cadets in the Air Force Academy and Reserve Officers Training Corps (AFROTC) or as trainees at Officer Training School (OTS). However, ours isn’t the only nation’s air force to take Gen. Douhet’s dictum to heart. The French Air Force (Armée de l’air et de l’espace) and French Naval Aviation (Force maritime de l’aéronautique navale, or simply Aéronavale for short) alike are embodying the Douhet doctrine in the form of the Dassault Rafale “Omnirole” (a fancy adjective for multirole) fighter. Let’s take a closer look at the Rafale, with a particular emphasis on the Rafale M naval variant.

Omnivorous Omnirole

The Dassault Rafale (literally meaning “gust of wind” and “burst of fire”) series fighters are built by Dassault Aviation S.A, which is arguably the most time-honoured name in French military aviation manufacturing, dating back to 1929. As stated by Dassault’s official info page on the Rafale, “Lessons learned from the latest conflicts where air power was used, can be summarized into four overarching expectations about weapon systems by political decision makers,” those being Versatility, Interoperability, Flexibility (Gen. Douhet must be smiling down from Heaven at that one), and Survivability.

The Website Elaborates From There:

“The ‘Omnirole’ Rafale combines all these advantages: it is relevant against both traditional and asymmetrical threats, it addresses the emerging needs of the armed forces in a changing geopolitical context, and it remains at the forefront of technical innovation...Thanks to its versatility, its adaptability and its ability to meet all air mission requirements, the Rafale is the ‘poster child’ transformational fighter which provides a way forward to air forces confronted to the requirement of doing ‘more’ with ‘less’, in an ever-changing strategic and economic environment...Of a moderate size, yet extremely powerful, superbly agile and very discrete, the latest type of combat aircraft from Dassault Aviation does not only integrate the largest and most modern range of sensors, it also multiplies their efficiency with a technological breakthrough, the ‘multi-sensor data fusion.’”

Accordingly, Dassault currently builds three variants: the Air Force single-seat Rafale C, the Air Force two-seat Rafale B, and the Navy single-seat Rafale M. All of the variants have the commonalities of twin-engines and canard delta wings. There was also the Rafale A demonstrator variant, which made her maiden flight on 4 July 1986, followed by the Rafale C on 4 May 1991. Whilst my own research has been unable to pin down the date of the Rafale M naval variant’s maiden flight, I can ascertain that the first two such seagoing warbirds were delivered to the Aéronavale in December 2000. On 18 May of the following year, the plane officially went operational with the squadron Flottille 12F — which had previously operated the American-made F-8 Crusader — and a total of 42 Rafale Ms have been delivered to the French Navy.

The M variant, at an empty weight of 10,600 kilograms (23,400 pounds), outweighs the Rafale C by about 500 kilograms (1,100 pounds) due to the extra beefing up needed for carrier operations. These beefed-up features include a strengthened airframe, longer nose gear to support a more nose-up attitude (literally, that is, not a metaphorical reference to stereotypes of Parisian snobbishness), larger tail-hook between the engines, and a built-in boarding ladder. The plane is 15.27 meters (50.1 feet) in length, 5.34 meters (17.5 feet) in height, 10.80 meters (35.4 feet) in wingspan, and boasts a max airspeed of Mach 1.8 (1,912 kph/ 1,188 mph/ 1,032 knots). Armament consists of a single 30 mm (1.2 in) GIAT 30/M791 autocannon with 125 rounds, and 13 hardpoints with a capacity for 9,500 kg (20,900 pounds) of ordnance, such as Magic II air-to-air missiles, GBU-12 Paveway-II and MK-82 bombs, the infamous Exocet anti-ship missile...and, in doomsday scenarios, the ASMP-A nuclear missile.

Going back to those principles of Versatility, Flexibility, and Interoperability, the Rafale M is the only non-US-designed fighter plane cleared to operate from the decks of US carriers, as demonstrated in 2008 during a joint Franco-American naval exercise involving the USS Theodore Roosevelt.

Rafales Vs. The Russians?

The Rafale-M has seen combat, as in 2016, Rafales operating from the nuclear-powered aircraft carrier Charles de Gaulle struck targets associated with the Islamic State AKA ISIS/ISIL/Da'esh. Though, so far, the Rafale has only been used in the air-to-ground role, the looming spectre of air-to-air engagement against Russian adversaries exists as at least an outside chance. The de Gaulle, which hosts 30 of the Rafale M warbirds, was dispatched in March of this year — on the heels of Vladimir Putin's commencement of his "special military operation" in Ukraine — in support of NATO's enhanced Vigilance Activities in the Black Sea region. Given Putin's latest provocation in Odesa, which threatens to worsen a global food shortage, time will tell if this escalates into a direct confrontation between Russia and the NATO powers; if worse comes down to worse, then the Aéronavale Rafale drivers may very well soon find themselves testing their mettle against the MiG- and Sukhoi-driving counterparts. We will find out soon enough, for better or for worse. Stay tuned, ladies & gentlemen.

<http://www.indiandefensenews.in/2022/07/frances-aircraft-carrier-fighter-rafale.html?m=1>

THE ECONOMIC TIMES

Mon, 25 Jul 2022

Ukraine Says it has Destroyed 50 Russian Ammunition Depots Using Himars

Ukraine said on Monday its forces had used U.S.-supplied HIMARS rocket systems to destroy 50 Russian ammunition depots since receiving the weapons last month. In comments on national television, Defence Minister Oleksiy Reznikov underlined the growing impact that the High Mobility Artillery Rocket Systems (HIMARS) are having as Ukraine tries to repel Russia's invasion. "This cuts their (Russian) logistical chains and takes away their ability to conduct active fighting and cover our armed forces with heavy shelling," Reznikov said. Reuters could not independently verify Reznikov's remarks. Russia did not immediately comment. Reznikov said Ukrainian artillery crews had conducted "precise" strikes on several bridges. He gave no details but was apparently referring to three river crossings in Russian-occupied Kherson region which local occupation authorities say were attacked by HIMARS over the past week.

Reznikov also said Ukraine had received three Gepard anti-aircraft armoured fighting vehicles, the first of 15 expected, and that Kyiv was expecting to take delivery of several dozen Leopard tanks. Russia says it has destroyed several of the HIMARS systems though Ukraine has denied this. In the latest such report, Russia's Defence Ministry said on Monday its forces had destroyed an ammunition depot for HIMARS systems in the Khmelnytskyi region in western Ukraine. Ukrainian officials have said repeatedly that Western supplies of weapons are critical to Ukraine's military effort, and underlined the importance of the HIMARS because of Russia's artillery supremacy in terms of numbers and ammunition.

HIMARS have a longer range and are more precise than the Soviet-era artillery that Ukraine had in its arsenal. Russia has criticised the United States in particular for providing Ukraine with

instructors to help Ukrainian forces use HIMARS. Russia, which invaded Ukraine on Feb. 24, has captured a chunk of territory in southern Ukraine and used its artillery supremacy in the east to make gradual territorial gains.

<https://economictimes.indiatimes.com/news/defence/ukraine-says-it-has-destroyed-50-russian-ammunition-depots-using-himars/articleshow/93111446.cms?from=mdr>

Science & Technology News

पंजाब केसरी

सोमवार, 25 जुलाई 2022

अंतरिक्ष स्टेशन पर उतरे चीनी अंतरिक्ष यात्रियों का प्रयोगशाला के मॉड्यूल में प्रवेश

चीन के निर्माणाधीन अंतरिक्ष स्टेशन में मौजूद उसके तीन अंतरिक्ष यात्री सोमवार को अपने देश की प्रयोगशाला के मॉड्यूल में सफलतापूर्वक प्रवेश कर गए। आधिकारिक मीडिया की खबर में यह जानकारी दी गई है। चीन ने वेंटियन नामक अपनी अंतरिक्ष प्रयोगशाला रविवार को शुरू की। चीन देश के अब तक के सबसे बड़े अंतरिक्ष यान को तियांगोंग नामक अंतरिक्ष स्टेशन का हिस्सा बनने के लिए पृथ्वी की कक्षा में भेज रहा है जो वर्तमान में निर्माणाधीन है। नियोजित कक्षा में प्रवेश करने के बाद सोमवार को तड़के अंतरिक्ष स्टेशन के सामने वाले हिस्से के साथ वेंटियन मॉड्यूल को संबद्ध किया गया।

पहली बार चीन के दो 20-टन-स्तर के अंतरिक्ष यान ने कक्षा में संबद्ध होते हुए डॉकिंग प्रक्रिया का संचालन किया है। यह भी पहली बार है कि अंतरिक्ष यात्रियों के अंतरिक्ष स्टेशन में प्रवास के दौरान अंतरिक्ष में मुलाकात और डॉकिंग प्रक्रिया संपन्न हुई। “चाइना मेन्ड स्पेस एजेंसी” (सीएमएसए) ने आधिकारिक मीडिया को यह जानकारी दी। समाचार एजेंसी शिन्हुआ की खबर के अनुसार, डॉकिंग के बाद, अंतरिक्ष स्टेशन का निर्माण कर रहे तीन अंतरिक्ष यात्रियों ने प्रयोगशाला में प्रवेश किया।

मिशन के योजनाकारों ने कहा कि आने वाले हफ्तों में, वेंटियन की एक रोबोट उपकरण के माध्यम से जगह बदली जाएगी और नयी जगह पर आने के बाद यह वहीं रहेगी तथा दीर्घकालिक संचालन के लिए तैयार होगी। चाइना डेली की खबर में बताया गया है कि नया लैब मॉड्यूल कोर मॉड्यूल के बैकअप और एक शक्तिशाली वैज्ञानिक प्रयोग मंच के रूप में काम करेगा।

<https://www.punjabkesari.in/international/news/pti-international-story-1643863>



**Press Information Bureau
Government of India**

Ministry of Science & Technology

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Capacity Building can Make India Global Leader in Good Laboratory Practice: DST Secretary

Secretary, Department of Science and Technology (DST), Dr S Chandrasekhar, highlighted that with Government's commitment and emphasis on further capacity building on Good Laboratory Practice (GLP) in the country, India is destined to be a global leader in the area. "On March 3, 2011, India received the status of full adherence to the Mutual Acceptance of Data (MAD), which gave global recognition to India's non-clinical safety data by tremendously augmenting its credibility and acceptability across the globe," said Dr Chandrasekhar at the opening meeting of the evaluation team from OECD, which is visiting the country for On-Site Evaluation (OSE) of the procedures and practices of the National GLP Program. MAD is a set of decisions that harmonises national approaches to regulation of laboratory practices developed by the Organisation for Economic Co-operation and Development (OECD), an international organisation that works to build better policies. The MAD status has not only boosted the confidence of Indian GLP Testing Facilities (TFs) but also led to removal of technical barriers to trade," Dr Chandrasekhar pointed out.

The National GLP Compliance Monitoring Programme of India is implemented through the National GLP Compliance Monitoring Authority (NGCMA), under the administrative control of DST with Secretary, DST as its Chairman. Compliance Monitoring Authorities (CMAs) of OECD member and fully adherent non-member countries are evaluated as per OECD's guidance document on 'Procedures and processes for the on-site evaluation of National GLP compliance monitoring programmes'. The guidance document mandates On Site Evaluation (OSE) of GLP Compliance Monitoring Programs of OECD countries and full adherent non-member countries every 10 years through Mutual Joint Visits (MJV). Dr Chandrasekhar informed that currently 52 test facilities in the country have been certified by NGCMA as GLP Compliant, which includes 3 Government labs - NIPER (Mohali), Indian Institute of Toxicology Research, Lucknow and Central Drug Research Institute, Lucknow. "The spectrum of activities of Indian GLP TFs is wide, involving ten (10) types of chemicals/test items and nine (9) areas of expertise. The National GLP program has not only helped to build a network of GLP TFs in the country but also created a huge quantum of highly competent human resources," he added.

Dr Akhilesh Gupta, Senior Adviser, DST said that the last OSE of Indian NGCMA was conducted in 2010. Based on the observations of the evaluation team, the NGCMA undertook an exercise to further enhance the robustness and transparency of the GLP inspections by rigorous training and evaluation of the NGCMA inspectors. "We look forward to this evaluation and to inputs from the team to further strengthen our compliance monitoring procedures," he added. Dr Ekta Kapoor, Head, Good Laboratory Practices, DST briefed about the programme and its achievements and future plans.

The opening meeting was attended by Dr. Fadhilah Hasbullah, Senior Principal Assistant Director, Ministry of Health, Govt. of Malaysia (Lead Evaluator), Ms. Naoko Moritani, Deputy Director, Chemicals Evaluation Office, Environmental Health Department, Ministry of the Environment, Government of Japan, Dr. Yusuke Oku, Policy Analyst, Environment, Health and Safety Division, Environment Directorate, OECD and Dr. Yoshio Sugaya, Guest Researcher, National Institute for Environmental Studies, Japan (Observer) along with the NGCMA inspectors and officials from DST.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1844717>



Mon, 25 Jul 2022

As India Celebrates Chandrayaan-2's 3-Year Anniversary, A Look Back on the Challenges ISRO Overcame

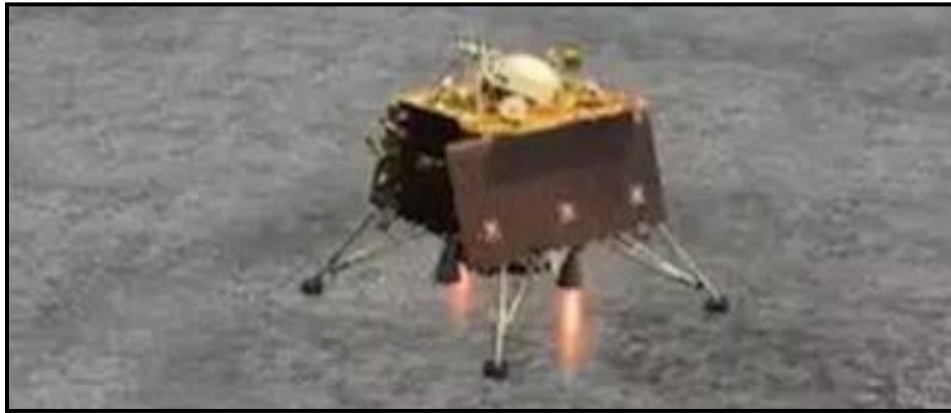
Chandrayaan-2, India's second moon spacecraft was launched on June 22, 2019. Three years ago on this date, the spacecraft made history as it was inserted into the lunar orbit on August 20, 2019. Though the soft-landing attempt of the lander Vikram was not successful, the orbiter, which was equipped with eight scientific instruments, was successfully placed in lunar orbit. The mission has accomplished the objective of expanding lunar scientific knowledge through a detailed study of topography, mineralogy, surface chemical composition, thermo-physical characteristics and tenuous lunar atmosphere leading to a better understanding of the origin and evolution of the moon, it added.

what were the objectives of the chandrayaan-2 project

- Studying and mapping the lunar terrain
- Mineralogical analysis of rocks and soil
- Studying the lunar ionosphere
- Measuring moon-quakes and studying the lunar crust and mantle
- Challenges that ISRO faced before the launch

The Indian Space Research Organisation faced many challenges during the launch of the historic spacecraft. Trajectory: Ensuring trajectory accuracy over 384,400km to Moon is difficult, especially while navigating the non-uniform gravitation pull of the Earth, the Moon, and other astronomical bodies. Deep space communications: The communication with earth will be only through weak radio signals with heavy background noise due to the heavy distance from where the orbiter will be inserted. Trans-lunar injection: To get to the lunar orbit for landing on the Moon, Chandrayaan-2 had to perform a series of complex burns to change orbit. Lunar orbit: Lunar gravity is lumpy due to uneven mass, influencing Chandrayaan's orbit. Lunar dust: Firing engines close to the lunar surface results flow of dust, which is negatively charged and sticks to most surfaces and can cause disruption in the deployment of solar panels, sensors etc.

Temperatures: A lunar day sees extreme variation in surface temperatures, along with the vacuum which in turn made the environment hostile for operations.



Though the soft-landing attempt of the lander Vikram was not successful, the orbiter, which was equipped with eight scientific instruments, was successfully placed in lunar orbit

Is Chandrayaan 3 Going To Be Launched Soon?

Chandrayaan-3, India's lunar mission, is likely to be launched during the quarter of 2022, Union minister Jitendra Singh said earlier, stressing that its progress was hampered due to the COVID-19 pandemic. Singh added that the realisation of Chandrayaan-3 involves a various processes, including finalisation of configuration, subsystems realisation, integration, spacecraft level detailed testing and a number of special tests to evaluate the system performance on earth. Chandrayaan-3 is critical for the Indian Space Research Organisation (ISRO) as it will demonstrate India's capabilities to make landings for further interplanetary missions.

<http://www.indiandefensenews.in/2022/07/as-india-celebrates-chandrayaan-2s-3.html?m=1>



Mon, 25 Jul 2022

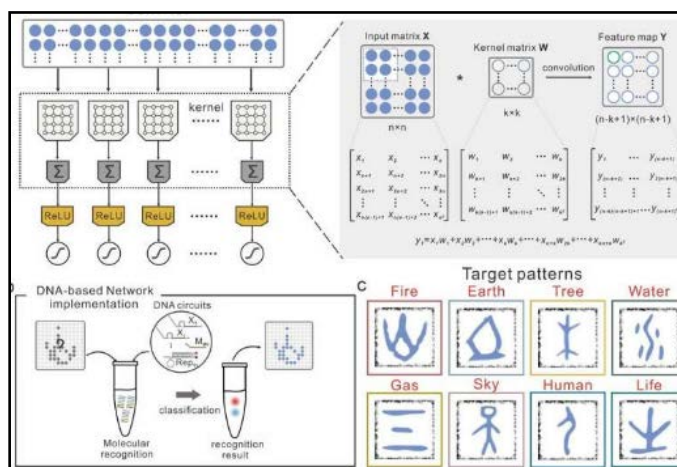
The Molecular Implementation OF A Dna-Based Artificial Neural Network

Molecular computing is a promising area of study aimed at using biological molecules to create programmable devices. This idea was first introduced in the mid-1990s and has since been realized by several computer scientists and physicists worldwide. Researchers at East China Normal University and Shanghai Jiao Tong University have recently developed molecular convolutional neural networks (CNNs) based on synthetic DNA regulatory circuits. Their approach, introduced in a paper published in *Nature Machine Intelligence*, overcomes some of the challenges typically encountered when creating efficient artificial neural networks based on molecular components.

"The intersection of computer science and molecular biology is a fertile ground for new and exciting science, especially the design of intelligent systems is a longstanding goal for scientists," Hao Pei, one of the researchers who carried out the study, told TechXplore. "Compared to the brain, the scale and computing power of developed DNA neural networks are severely limited, due to the network size limitations. The primary objective of our work was to scale up the computing power of DNA circuits by introducing a suitable neural network model for DNA molecular systems." While conducting their research, Pei and his colleagues found that could be particularly promising for modeling DNA circuits, due to their sparse topological connectivity, which resembles that of real biological neural networks. They thus decided to use CNNs to devise a large-scale DNA-based neural network comprised of 512 synthetic DNA strands. Notably, their proposed network produces thousands of chemical reactions and generates hundreds of molecular species.

"Our group has been focused on the precisely engineering and programming of nucleic acids molecules, and we have designed and constructed a series of dynamic DNA nanostructures that could potentially be used as regulatory elements for the construction of large circuits," Pei explained. "In this work, we make use of a dynamic DNA nanostructure called switching gate, which is functionally similar to the riboswitches in gene regulatory circuits, all consisting of two independent functional domains that sense and respond to external inputs."

The switching gate in the researchers' network allows them to independently control its signal transmission functions and weight assignment functions through a process known as intramolecular conformational switching. This process is particularly suited for the weight-sharing and sparse connectivity of CNNs.



Molecular convolutional neural networks with DNA regulatory circuits.

The DNA circuits operate within the researchers' network, where all computing units are ready to respond to inputs. Once the inputs are fed to the solution, single DNA strands will trigger cascaded strand displacement reactions in order. These reactions, driven by the Gibbs free energy or entropy in the system, generate corresponding fluorescent signals. The researchers' encoded all test patterns using a set of single DNA strands and each of the generated fluorescence signals represents one of these test patterns. "We have extended the key feature of the CNN—sparse topology and weight-sharing architecture to a DNA neural network, which can effectively reduce complexity and parameters of network architecture through sparsely

connected neurons," Pei said. "To implement these features, we have designed switching gate architecture composed of two independent functional domains (weight tuning domain and recognition domain). With this design, we can easily change the sequence design of corresponding functional domain respectively to fit the adjust of network architecture."

The CNN-based approach has several advantages over previously proposed molecular computing methods. Firstly, its switching gate architecture could be used to embed ligand-responsive molecular switches. This would allow the network to adapt its functions in response to environmental changes, potentially enabling the development of molecular circuits that resemble biological neural networks and capable of "intelligent" behavior. In addition, the inherently parallel nature of DNA molecules could enable the autonomous parallelization of the CNN's operations. This could be particularly valuable for achieving scalable information processing. "We have proposed a systematic strategy for implementing the ConvNet algorithm at the molecular level," Pei said. "We feel that our method is a major advancement in artificial molecular information-processing systems, as it achieved rapid and accurate classification tasks that could classify 32 molecular patterns within 30 min, which might be the fastest and the most powerful and complex artificial chemical computing system to date, as far as we know."

The recent work by Pei and his colleagues introduces an alternative DNA-based architecture that could inform the design of new molecular computing systems. In the future, their approach could be used to create various molecular diagnostic devices for biomedical applications. "By interfacing sensory inputs, the DNA-based ConvNet could in principle use hundreds of targets as inputs and facilitate broader applications in disease diagnostics, profiling expression patterns, and precision medicine," Pei added. "Based on this DNA-based ConvNet model, we now plan to construct molecular classifier that can be used for multi-disease diagnostic classification."

More information: Xiewei Xiong et al, Molecular convolutional neural networks with DNA regulatory circuits, *Nature Machine Intelligence* (2022). [DOI: 10.1038/s42256-022-00502-7](https://doi.org/10.1038/s42256-022-00502-7)
<https://techxplore.com/news/2022-07-molecular-dna-based-artificial-neural-network.html>

