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नवभारत टाइम्स

19 जुलाई 2022

डीआरडीओ ने भारतीय कंपनियों के साथ अब तक 1,464 प्रौद्योगिकी हस्तांतरण समझौते किए : सरकार

नयी दिल्ली, 19 जुलाई (भाषा) रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) ने भारतीय कंपनियों के साथ अब तक 1,464 'प्रौद्योगिकी हस्तांतरण' समझौतों पर हस्ताक्षर किए हैं। रक्षा राज्य मंत्री अजय भट्ट ने कहा कि डीआरडीओ देश में विकसित की गईं रक्षा प्रौद्योगिकी ''प्रौद्योगिकी के हस्तांतरण के लिए लाइसेंसिंग समझौते'' के जरिए भारतीय उद्योग को हस्तांतरित करता है। उन्होंने कहा कि डीआरडीओ ने अब तक उद्योगों के साथ 1464 प्रौद्योगिकी हस्तांतरण समझौतों पर हस्ताक्षर किए हैं।भट्ट ने एक सवाल के लिखित जवाब में राज्यसभा को यह जानकारी दी। उन्होंने कहा कि आत्म-निर्भरता घरेलू प्रौद्योगिकियों और उत्पादों से प्राप्त की जा सकती

इसके लिए, डीआरडीओ एक सतत प्रक्रिया के रूप में उद्योगों को घरेलू स्वदेशी अत्याधुनिक रक्षा प्रौद्योगिकियां प्रदान करके रक्षा क्षेत्र में आत्म-निर्भरता को बढ़ाने के लिए लगातार कार्य कर रहा है। उन्होंने एक अन्य सवाल के जवाब में कहा कि सरकार लड़ाकू जेट इंजनों के विकास और उत्पादन में सहभागिता के लिए एक विदेशी इंजन कंपनी के साथ सहयोग की संभावना तलाश रही है।

https://navbharattimes.indiatimes.com/india/drdo-has-so-far-signed-1464-technology-transfer-agreements-with-indian-companies/articleshow/92984818.cms

THE ECONOMIC TIMES

Tue, 19 Jul 2022

DRDO has Signed 1,464 Technology Transfer Agreements with Indian Companies Till Date: Government

The Defence Research and Development Organisation (DRDO) has signed 1,464 'transfer of technology' agreements with Indian companies till date, Minister of State for Defence Ajay Bhatt said on Monday. The DRDO is working relentlessly for enhancing self-reliance in defence sector by providing home grown indigenous state-of-the-art defence technologies to industries, as a continuous process, he said in his written reply to a question in Rajya Sabha. "The DRDO transfers indigenously developed defence technologies to Indian industries by signing the Licensing Agreement for Transfer of Technology. Till date, DRDO has entered into 1,464 ToT agreements with industries," the minister noted.

In reply to another question, the minister said that the government is looking for collaboration with a foreign engine company for co-development and co-production of combat jet engines, which will have thrust higher than 80 kiloNewtons (kNs), for India's advanced medium combat aircraft. Indigenous capability already exists with the DRDO and Indian industries for design, development and manufacturing of 80kN combat jet engine. He said the share of foreign procurement in the total defence procurement in 2021-22 was 36.25 per cent. In 2020-21 and 2019-20, the share of foreign procurement was 36.40 per cent and 41.18 per cent, respectively.

https://m.economictimes.com/news/defence/drdo-has-signed-1464-technology-transfer-agreements-with-indian-companies-till-date-government/amp_articleshow/92985418.cms

THE HINDU

Tue, 19 Jul 2022

APJ Award Presented to DRDO Scientist Tessy Thomas

Governor Arif Mohammed Khan on Tuesday presented the APJ Award instituted by Noorul Islam University to Tessy Thomas, scientist and Director General, Aeronautical Systems, Defence Research and Development Organisation (DRDO). The award, comprising a cash prize of ₹1,00,000 and a citation, was given away at a function held at the NIMS Medicity auditorium.

Dr. Tessy Thomas, also known as Missile Woman, was selected for the award for her role in developing indigenous missile systems. The jury was headed by Dr. A.P. Majeed Khan, chancellor of the university. Dr. Thomas interacted with the students of the university and spoke about the strides taken by the country in space and allied sectors and the road ahead.

Governor Arif Mohammed Khan presents the APJ award instituted by Noorul Islam University to DRDO scientist Dr. Tessy Thomas in Thiruvananthapuram on Tuesday. University Vice Chancellor Dr. Kumaraguru, Chancellor Dr. A.P. Majeed Khan and NIMS Medicity managing director M.S. Faisal Khan are also seen. | Photo Credit: Special Arrangement

NIMS Medicity managing director M.S. Faisal Khan, Noorul Islam University Pro-Chancellor Dr. Perumal Swami and Vice Chancellor Dr. Kumaraguru were among those present. The university also felicitated those who have put in exemplary service in different sectors.

https://www.thehindu.com/news/national/kerala/apj-award-presented-to-drdo-scientist-tessy-thomas/article65658626.ece

Defence News

Defence Strategic: National/International

IDN INDIAN DEFENCE NEWS
Global Defence, Aerospace & Security

Wed, 20 Jul 2022

Indonesia May Become Second ASEAN Member to Buy Brahmos; Talks in Advanced Stage Says a Report

India's Act east Policy will get a boost when another export order for shore based anti-ship variant of the BrahMos supersonic cruise missile by year end is Inked. "Talks with Indonesia are in advanced stage for the export of the Indo-Russian BrahMos supersonic cruise missile. The deal could have been signed earlier, however, due to internal matters of that country, by year end, or early next year the deal is expected to be sealed," reports The Financial Express.

First Strike: India's First Export Sale of The BrahMos To The Philippines

India’s sale to the Philippines of its BrahMos supersonic cruise missile marks a key strategic turning point, with India firmly wading into the South China Sea hot spot and Manila taking order of its first major cruise missile system. Significantly, both countries are locked in long-standing territorial disputes with China, which can now expect to see more of the much-vaunted BrahMos missile system on its disputed borders in the Himalayas with India and in the South China Sea with the Philippines Asia Times had reported. It is worthy to note in this context, due to India's strategic reticence, it had failed to export the highly accurate Prithvi surface-to-surface missiles to Vietnam. But things have changed under the more assertive Narendra Modi government, which aims to increase annual defence exports to $5 billion by 2025. If the deal goes through without any hiccups, Indonesia will become the second ASEAN member country after the Philippines to import these deadly missiles from India. Potential Expansion To India's Strategic Interests In The Indo-Pacific Region.

The BrahMos sale to Indonesia will potentially serve as a springboard for more concerted efforts by the Quadrilateral Security Dialogue (Quad) powers of India, US, Japan and Australia to enhance the deterrence capacity of smaller, aligned powers in the Indo-Pacific. People familiar with developments said that a team from the BrahMos Aerospace, that makes the weapon system visited a state-run shipyard in Surabaya, Indonesia in 2018 to assess the fitting of the missile on Indonesian warships. The highly dexterous supersonic missile system can be deployed on warships, submarines as well as fighter jets, giving the platform’s operators a wide range of options in its deployment. The BrahMos may be an effective system as Indonesian strategic planners hope, due to the dismal performance of Chinese HQ-9 defence which failed to detect and counter a rouge BrahMos missile fired inadvertently by India into Pakistan, though the Chinese system is said to boast of an advanced guidance systems and multi-target anti-jamming capabilities. The Indonesian and Indian armies have held exercises for several years and the first bilateral naval wargame was held last November. The first bilateral air force exercise is expected to be held in 2019, the people said.

http://www.indiandefensenews.in/2022/07/indonesia-may-become-second-asean.html?m=1

FINANCIAL EXPRESS
Read to Lead

Tue, 19 Jul 2022

Indonesia to Buy Brahmos Missile from India? Talks in Advance Stage

By Huma Siddiqui

The Asean nations had approached India for the BrahMos and Akash Missiles during the 10 ASEAN leaders met during the ASEAN-India Commemorative Summit in New Delhi in January 2018. Earlier this year, India and the Philippines had inked a USD 374.96 million contract for the supply of shore based anti-ship variant of the BrahMos supersonic cruise missile. This made the Philippines the first Asean member country to import missiles from India. The BrahMos missile that Indonesia is expected to import from India is going to be fitted onboard its warships. A team

from BrahMos Aerospace joint venture between New Delhi and Moscow has already visited Indonesia shipyard to study the possibility of fitting the missile.

The BrahMos is a short-range ramjet supersonic cruise missile and according to the company it can be launched from aircraft, ships, land platforms and submarines. And this missile can fly at a speed of 2.8 Mach, or equivalent to three times the speed of sound. The BrahMos which has been developed at a low budget of $300 million is also sought by other countries in the region including: Malaysia which is set to announce its final decision to buy Light Combat Aircraft (LCA), Singapore, Thailand, and Vietnam. Financial Express Online had reported earlier that Vietnam was in negotiations with India for both BrahMos and Akash missiles. Talks are also going on with Malaysia for BrahMos Missile, those it's just in the initial stage.

With the deal with Indonesia expected to be sealed year end/early next year, it will give India a strategic hold in the region as well as give a boost to the economy. The announcement of the sale of BrahMos Missile to the Philippines was initially made by the Russian side in New Delhi. Russia will have no objection to exporting to Indonesia as it is already selling Su-27 fighter jets as well as Kilo Class submarines to that country.

Indonesia & India Military Cooperation

The bilateral relations between the two countries have been deepening over the years. Indonesia is considered to be an important partner in India's "Act East" policy.In 2018, Financial Express Online had reported that the bilateral relations between the two countries have been elevated to "'Comprehensive Strategic Partnership' when Prime Minister Narendra Modi had visited that country. The main pillar of this partnership is based on maritime security and defence and security cooperation. And in 2018, the first ever Indian Navy – Indonesian Navy Bilateral Exercise 'Samudra Shakti' took place. This maiden drill focused on enhancing interoperability, expanding maritime co-operation, and to exchange best practices. India and Indonesia are Indian Ocean Littoral neighbours and the two sides have been working towards strengthening military ties.

In view of the growing Chinese presence in the Indian Ocean Region (IOR), and its activities near Natuna Islands, both India and Indonesia are working towards deepening maritime cooperation and ensuring secure sea lanes of communication in the larger Indo-Pacific.

https://www.financialexpress.com/defence/fe-exclusive-indonesia-to-buy-brahmos-missile-from-india-talks-in-advance-stage/2598803/lite/

IDN INDIAN DEFENCE NEWS
Global Defence, Aerospace & Security

Wed, 20 Jul 2022

A Drone that can Carry a Human; Unveiled in Presence of PM Modi

In a historic feat, India's first drone that can carry human payload of up to 130 kgs was unveiled in the presence of Prime Minister Narendra Modi during Naval Innovation and Indigenisation

Organisation (NIIO) seminar 'Swavlamban' in New Delhi. 'Varuna' country's first human carrying platform — pilot-less drone, has been indigenous developed by the Indian start-up Sagar Defence Engineering. The drone has the capacity to carry one person inside. During the demonstration the pilot-less drone flew around two meters above and then moved forwards before coming back to land. According to Sagar Defence Founder and CEO Nikunj Parashar, this is India's first electronic human carrying platform and the drone has been specially made for the Indian Navy, where the force can initially use it in transferring materials from one ship to another in future. A patient can also be taken to the hospital. In 'Varuna', there are four auto-pilot modes which enable it to continue flying even if some fans fail to function, he added.

Deciphering Varuna

Presently, undergoing the land-based trial, Varuna will hit the sea trials in the next three months. The personal air mobility vehicle has the capability to fly till the range of 25km while carrying a payload of 130 kilograms. Further, it can endure between 25- 33 minutes. Interestingly, Varuna has been developed in two parts – one being the technology, which helps the drone to land and take off from moving warships and the second being the platform itself. Notably, the landing and taking off technology has been developed in tandem with Indian Navy DSR. India's first human carrying drone is presently being developed along with NTDAC (Naval Technology Development acceleration cell). It is noteworthy that 30 Varuna drones which can land and take off from warships, have already been delivered to the Indian Navy, and it is also the first time ever that the Indian Navy is inducting drones on warships, Parashar added.

Initially it can be used for moving /transferring materials. There are four auto-pilot models which help the drone to continue flying even if some fans fail to function. This new vehicle has the capability to be used for inter-ship transfer of material and personnel. And is capable of carrying out autonomous take-off and landing even when the ships are moving. Besides using it to transfer materials from one ship to another, the drone can also deliver medical facilities like delivery of essential medicines to far off areas and medical evacuation. This means, in case of emergency, a person can be evacuated from sea, and immediately taken to the hospital. In June last month, Sagar Defence Engineering had given a demonstration of the new personal air mobility vehicle to the Deputy PM of Australia who had visited INS Hansa in Goa. Further, the start-up has already been awarded a contract for the development of an autonomous and intelligent underwater swarm of drones under Innovations for Defence Excellence (iDEX) by Defence Innovation Organisation (DIO) along with the development support from Mazagon Dock Limited (MD), who is the funding, testing as well as manufacturing partner.

http://www.indiandefensenews.in/2022/07/a-drone-that-can-carry-human-unveiled.html?m=1

IDN INDIAN DEFENCE NEWS
Global Defence, Aerospace & Security

Wed, 20 Jul 2022

IAF's 6 Squadrons of TEJAS MK-2; will be Much More Sophisticated, Equipped with State-of-the-Art Features

According to Air Chief Marshal Chaudhary, only aircraft made under the Make in India scheme will be included in the Indian Air Force in the future. These will include TEJAS MK-1A, TEJAS MK-2, and AMCA. 114 multi-role fighter aircraft will be inducted into the Air Force. The advanced version of the country-made fighter aircraft TEJAS will soon increase the strength of the Air Force. Air Chief Marshal VR Choudhary said that six squadrons of TEJAS MK-2, an advanced version of the Air Force Light Combat Aircraft (TEJAS), will be built. The Air Force has decided to buy 108 planes necessary for them. The IAF has already placed orders for four squadrons of TEJAS MK-1A. The TEJAS MK-2 fighter is not only more powerful than the existing MK-1, but the attacking systems in it are also highly advanced. The new version of the aircraft will be equipped with a BrahMos missile. It will also fit laser-guided bombs like the Mirage-2000. With this, the new TEJAS will be able to attack the enemy from air to land.

Indigenous Aircraft of Fifth Generation Will Also Be Available

After the production of TEJAS MK-2 starts, the Air Force will place orders for this fighter in large numbers. The TEJAS MK-2 fighter aircraft will replace the Mirage 2000 and Jaguar fighters after a decade. After this, there are plans to induct at least seven squadrons of the fifth generation Advanced Medium Combat Aircraft (AMCA) into the Air Force.

TEJAS MK-2 Will Be More Potent Against Enemies

In terms of design, the TEJAS fighter falls in the category of delta wing aircraft. That is, it will be less likely to crash when attacked. The wings of TEJAS MK-2 are 30cms bigger than that of MK-1 In the new model, canards have been given on both sides of the front of the wings of the aircraft so that the aircraft will be saved from enemy firing attacks. This feature was not in the current version of TEJAS MK-1. It is placed in the category of medium-weight fighters, while the MK-1 is in the light combat aircraft category. The increased weight is due to the advanced radar and necessary changes to the additional capability. The new version can fly up to an altitude of more than 56 thousand feet. The flying ceiling of TEJAS MK-1 is 50 thousand feet. The extra height will help in attacking the enemy. Missile approach warning system. If there is a missile attack from behind, then the aircraft will release so much smoke on the backside that the enemy missile will be confused, and its target will be missed. There is also a voice command in the cockpit. If the pilot does not have time to push the button, then he can launch a missile attack only by giving a sound. It is claimed that it will be more effective than Rafale in the attack

Powerful Weapons Will Be Installed In TEJAS MK-2

While there will be 11 hard points in the advanced version MK-2 of TEJAS, the weapons in it will be able to attack from air to the ground. Apart from these, the ability to protect itself at the time of the attack will also be present in the aircraft. These weapons will be installed in the new TEJAS.

- Air to Air Missile (BrahMos)
- Air To Surface Missile
- 30 MM Gun
- Anti-Radiation
- Air Weapon
- Laser Guided Bomb
- Air borne attack systems will also be Made in India

According to Air Chief Marshal Chaudhary, only aircraft made under the Make in India scheme will be included in the Indian Air Force in the future. These will include TEJAS MK-1A, TEJAS MK-2, and AMCA. 114 multi-role fighter aircraft will be inducted into the Air Force. The IAF has also decided that in the future, all surface-to-air weapon systems will also be Made in India. At present, many indigenous radars have been deployed in the operational areas.

TEJAS Fighter Jet Squadron Deployed In Sulur

In July 2018, Squadron No 45 Flying Daggers of indigenous fighter aircraft TEJAS was deployed at Sulur Air Force Station in Tamil Nadu. This is the first squadron to fly TEJAS. Earlier it was stationed in Bangalore and it was here that TEJAS was inducted in 2016.

http://www.indiandefensenews.in/2022/07/iafs-6-squadrons-of-tejas-mk-2-will-be.html?m=1

THE ECONOMIC TIMES

Mon, 18 Jul 2022

Prime Minister Urges Industry to Come Up with Local Innovations

Making a case for innovative solutions by the industry, Prime Minister Narendra Modi said that soldiers can achieve an edge in the battlefield only through indigenous efforts and that the era of import dependence was over with the active participation of the private sector and startups in the sector. "Innovation is critical and it has to be indigenous. Imported goods can't be a source of innovation," he said, addressing a naval seminar in the capital to kickstart the process of inducting 75 indigenous technologies. The PM said India has reduced its defence import bill by over 21% in the past 4-5 years and is fast moving towards becoming a major weapons exporter, nudging the industry and forces to prepare for all domains of future warfare.

"We have talent. It is not smart to let soldiers go to the field with the same weapons that the world has. That risk cannot be taken. The soldier should have (equipment) that the opponent will not even be able to think of," he added. The PM said that means of warfare are no longer limited to land, sea and sky but are moving towards space, cyberspace, economic and social domains. "As India is establishing itself on the global stage, there are constant attacks through misinformation, disinformation and false publicity, etc. Keeping faith, the forces that are harming India's interests, whether in the country or abroad, have to be thwarted in their every effort. National defence is no longer limited to borders, but is much broad he said. Modi said that

the defence budget in the past eight years has been increased and a large part of it has been earmarked for purchases from the Indian industry. He pointed out that last year, Rs 13,000 crore worth of defence exports were achieved, with 70% of these attributed to the private industry.

Defence minister Rajnath Singh said the Navy spent over 64% of its capital budget on domestic procurement in the last financial year, which is now expected to increase to 70%. He said the role of the Indian Navy will increase further in the Indian Ocean Region in times to come, adding that the nation is moving towards becoming a major exporter of weapon systems. "The self-reliance efforts in the defence sector have transformed India's image and we will soon become a global manufacturing hub," he said.

https://economictimes.indiatimes.com/news/defence/prime-minister-urges-industry-to-come-up-with-local-innovations/articleshow/92964735.cms

The Tribune

Mon, 18 Jul 2022

India to Make Diesel Engines for Ships

In an important announcement on military technology, the Ministry of Defence will manufacture diesel-powered marine engines used in ships and also design and develop a heavy-lift helicopter for the three services. Both projects will have participation of the private sector. The announcements were made at a seminar organised by the Naval Innovation and Indigenisation Organisation (NIIO) and the Society for Indian Defence Manufacturers here. Later,, PM Narendra Modi spoke at the same seminar, titled “Swavlamban” (self-reliance), and described the goal of self-reliance in the Indian defence forces.

“In the past four-five years, the defence imports have come down by 21 per cent. Today, we are moving fast to be a big exporter. Last year, Rs 13,000 crore worth of defence export was made,” Modi said. This figure of 21 per cent reduction, what Modi cited, is part of the report by Stockholm International Peace Research Institute in March. Comparing two five-year blocks — between 2012-16 and 2017-21 — it said Indian arms imports decreased by 21 per cent.

https://www.tribuneindia.com/news/nation/india-to-make-diesel-engines-for-ships-413614

FINANCIAL EXPRESS
Read to Lead

Tue, 19 Jul 2022

Laying the Keel of India’s Third Nuclear-Powered Aircraft Carrier

By Manish Kumar Jha

The fourth phase of Sea Trials for IAC has been successfully completed on 10 Jul 22, during which integrated trials of majority of equipment and systems onboard including some of the

Aviation Facilities Complex equipment were undertaken. The ship's delivery is being targeted in end Jul 22, followed by commissioning of the ship in Aug 22. While the Maiden Sea Trials of IAC were successfully completed in Aug 21, the debate for the 3rd aircraft carrier began to rise. Debate centres around the fact that India must develop its requisite maritime power due its defining feature and strategic lines around the Indian Ocean Region. Currently, India has operationalised only one conventional aircraft carrier, INS Vikramaditya, a modified Kiev-class carrier, on its western seaboard. INS Vikrant, India's second aircraft carrier is undergoing sea trials since August 2021 and is set to be commissioned this year. This is to be deployed on India's eastern seaboard after one year of infrastructural completion alongside INS Vikramaditya on the western coast.

While INS Vikramaditya was purchased from Russia for a price of US$ 2.35 billion in 2004, INS Vikrant is indigenously developed (IAC-1), the cost of the project has been estimated to be US$ 3.1-3.5 Billion. But in total, INS Vikramaditya cost India US$ 10-11 Billion. The quest for the 3rd aircraft carrier is based on nuclear powered propulsion system; A nuclear-powered carrier that can meet the space and size demands of IAC-2. The Indigenous design and construction of Aircraft Carrier by Indian Navy and Cochin Shipyard Ltd is a shining example in the Nation's quest for building warships of such size and scale with more than 76% indigenous content. This has led to growth in indigenous design and construction capabilities, besides development of large number of ancillary industries, with employment opportunities for over 2000 CSL personnel and about 12000 employees in ancillary industries.

The Specification of 3rd Aircraft Carrier

But if one looks at the industry requirements laid out by the Indian Navy in the letter of request it sent out to global shipbuilders in 2015, the displacement for IAC-2 was suggested as 300 metres (38 metres longer than IAC-1's 262-metre displacement), its weight was suggested to be 65,000 tonnes (as opposed to IAC-1's 45,000-tonne weight), and its intended speed was more than 30 knots or 56 km/h (against IAC-1's 28 knot or 52 km/h top speed). In this context, the technological sophistication and investment required in the development of IAC-2 will naturally have to be multiple steps ahead of the current level of indigenous capabilities. While INS Vikrant is 260 meters long and 60 meters wide vessel displacing 37,500 tonnes. The maximum speed of the ship is announced at 28 knots, with a range of 7,500 nautical miles at a speed of 18 knots. INS Vikrant is set to receive a large crew complement composed of 160 officers and 1,400 sailors. The STOBAR aircraft carrier will be able to accommodate up to 30 fighters and helicopters, including Mig-29K fighters' jets and Ka-31 helicopters.

Why India needed a third Next-Generation Aircraft Carrier

In the words of the former Indian Chief of Naval Staff Admiral Karambir Singh, for India, "Air power at sea is required here and now". The Indian Maritime Doctrine and Ensuring Secure Seas: Indian Maritime Security Strategy are two key official documents that deal with the subject of maritime security in India. While it is evolving the idea of strategic outreach is firmly entrenched. A third aircraft carrier is if you want one aircraft carrier to be ready all time then there must be three aircraft carriers. In the chain, one strike group remains for the maintenance, refit or major overhaul. The common debate on the carrier is like this: Modern warfare does not require such gigantic warships which is equally about the massive cost in tune of USD 4-5

billion. Instead, IN can build many destroyers and frigates– can strengthen the number of warships.

It is of utmost importance that debate on such critical issue of national consequence is laid out with clarity, assessing the broad argument. Where is the argument leading when it comes to the massive size of the warship in the era of unconventional warfare? Admiral Arun Prakash served as Naval Chief and Chairman Chiefs of Staff. An aviator by specialisation, during his 40-year career, he commanded a carrier-borne fighter-squadron, a naval air station and four warships; including the aircraft-carrier INS Viraat. Speaking with the author, Admiral Arun refers to the foundational shift in the projection and the way we have laid out our conduct on national security and sovereignty. He says: "Diplomats will testify that it is not the Indian army's 4000 tanks or IAF's 29 squadrons of combat aircraft that make India an attractive partner for the USA or the Quad nations. It is the Indian Navy's ability to project influence and power in distant reaches of the Indo-Pacific – largely via maritime air power."

So, it is the era of maritime and India's geography itself makes a compelling case for the maritime expansion and ties. The shift that we are talking about in the present context is too apparent that maritime leads the discourse in the geopolitics. The entire construct of foreign policies is now based on the strength of economic power. Admiral Arun Prakash finds much credence in this context as he refers to the global maritime powers, says: "The US Navy slogan, advertising its carriers as, "4.5 acres of sovereign territory," is an indicator of the value that a carrier brings to situations that require, 'presence,' 'show of force,' or humanitarian assistance and disaster relief,' (HADR)." In this context, there is no denying that regardless of the cost differential, no combination of destroyers, frigates or attack-submarines can quite substitute the combat power and maritime influence represented by an aircraft-carrier.

The case of maritime industry 4.0

India's maritime has 7,517 km- long coast line with nine major costal states that handle more than 2000 million tonnes of cargo every year. The realization that maritime is such an opportunity for the nations' economic growth has taken the center stage. India's maritime outlook is all about the discourse centered around trade, commerce, infrastructure, ecology and security. It is of course given greater attention in the context of Indo-Pacific strategy and India's core maritime initiatives called—SAGAR (Security and Growth for All in The Region). So that is where the India's maritime strategy calls for maritime infrastructure and capacity for a maritime security framework across the vast expanse of oceans to deter, project or combat transnational and other security challenges. How do we look at such an argument beyond the realm of security? Former Navy Chief looks at the need for the aircraft carrier from the scale of industrial activities in addition to the often-quoted debate based on the security perspective.

In fact, he commanded the aircraft-carrier INS Viraat, a flagship of the Indian Navy before INS Vikramaditya was commissioned in 2013. The Royal Navy's HMS Hermes in her new avatar—INS Viraat was sold to India in 1987 which served for almost 30 years. He talks about the such maritime industrial opportunities for the projected 3rd aircraft carrier. "It will also go a long way in skilling our youth and creating job-opportunities by the thousands. Concurrently, it would, also, strengthen the supporting industrial base for the Indian Navy," he says. Take the case of IAC-1 when we analyse the sheer scale of industrial production and ancillary activities in the process. According to the Officials from the Ministry of Defence (MoD), over 76 per cent of the

material and equipment on board IAC-1 is indigenous, including "21,500 tonnes of special grade steel developed indigenously and used in Indian Naval Ships for the first time".

According to report which actually talks about the scale of economic gains in taking such exercise for emerging maritime power like India, Indian Navy has elaborated that over 50 Indian manufacturers were directly involved in the project, which is a result of the labours of more than 40,000 people who were employed directly or indirectly in its construction. "More than three-fourths of the total project cost about INR 23,000 crore (85 percent of the carrier's project cost) has been reinjected into the Indian economy," reports add. The carrier also directly employs on average 2,000 people every day. Besides, it is about the technology and skills which only five or six countries have the capability of designing and executing the construction of an aircraft carrier. The 3rd aircraft carrier will put India firmly as the blue water marine power with inherent advanced capability in the area of shipbuilding.

N- Powered Indian Aircraft Carrier

Why do we not look at nuclear-powered aircraft carrier as a third option? What is the best fit if we look at the future of warfare especially in IOR and beyond? Aircraft carriers powered by nuclear energy and assisted by logistical escort vessels to sustain the needs of crew on deck, can truly transform the narrative of establishing a blue water navy by functionalising a renewable, long-lasting, and self-sustainable source of energy to keep the carrier moving for over 10-20 years, with a 50-year lifespan in total. A nuclear-powered (N-powered) aircraft carrier may still appear on shore only to restock its fridges, but not to undergo the lengthy Refuelling and Complex Overhaul (RCOH) processes that aviation-fuel powered aircraft carriers would require. N-powered carriers need RCOH only once in their mid-life stage (at up to 25 years after being commissioned).

Admiral Prakash makes a compelling case for it. He says: "A nuclear-powered aircraft carrier would be an ideal solution for the navy's sea control and power projection tasks in the Indo-Pacific. Indeed, it is about building the advanced capabilities, leveraging on the existing know-how that we have gained over the years. For example, the critical propulsion system which we learnt by working on the submarines must be put to test in building next generation system for aircraft carrier. The quest for developing indigenous capabilities in advanced areas is actually about realizing such constant endeavours. Else, our technological strength would be limited to the tested areas especially in defence. In fact, many of the existing technologies will be utterly useless in the new dimensions of the modern warfare. The 3rd aircraft will provide a great opportunity to develop next generation propulsion machinery, electrical & electronic suites, deck machinery, lifesaving appliances, ship's Navigation and Communication systems among other critical system and sub-systems.

China as a factor

Should we take China as a factor in our assessment for the 3rd IAC? Whilst we are aware of the economic disparity with China? India's $ 3.1 trillion is pitted against China's $17.7 trillion but it does warrant a objective assessment. China puts its Indigenously produced aircraft carriers as important component of military modernization drive. More so, it puts aircraft top of its national security and military strategies. China has already embarked on a strong naval presence—established naval ports in the Indian Ocean as an integral component of its maritime strategy. China has already launched its third aircraft carrier, named Fujian (18) this year. And this is the

right approach for the capability build-up on the existing technologies. The 80,000-ton carrier improves upon as China builds its first flat deck carrier and uses Electromagnetic Aircraft Launch System (EMALS)-powered catapults to launch its aircraft, in contrast to the ski jump of its other two carriers. The EMALS system can launch heavier aircraft and in much shorter timeframe.

Commodore Sujeet Samaddar, Founder SAMDeS and former adviser to Niti Aayog put it straight: "By 2030 the PLAN can deploy two 80000 DWT carriers with 100 fighters, 40 multi role helicopters, dozens of UCAVs, supported by 60-70 Frigates, Destroyers and assault ships 6 nuclear submarines and 30 conventional submarines for sea control in the IOR after having reserved twice this number for sea denial of their own sea areas. This is enough to completely disrupt the SLOCs and the national economy competing for ever scarce resources and commodities. As per the capability roadmap, Indian Navy planned a fleet of 200 ships by 2027, which would include three aircraft carriers. Its current strength is 137 vessels, with only one aircraft carrier in service. China has already built up a 355-vessel fleet and its is already larger than the US navy. Admiral Prakash gives the realistic overview says, we do not have the economic or technological capability to engage in a naval/armament race with China. And yet, our force-planning must take into account; (a) our vital national interests and (b) the threats that we face. In this calculus, China will certainly count as a factor.

https://www.financialexpress.com/defence/laying-the-keel-of-indias-third-nuclear-powered-aircraft-carrier/2598992/lite/

Hindustan Times

Wed, 20 Jul 2022

Spotlight on Theaterisation Again as More Delays Loom

The debate over the theaterisation model, which moved to the back-burner after India's first chief of defence staff (CDS) General Bipin Rawat was killed in a helicopter crash last December, was reignited last week. The Indian Air Force's (IAF) lingering concerns about the current theaterisation model indicate that interservice differences have still not been reconciled, and raised concerns that the lack of consensus on joint structures may further delay the military reform needed to best utilise resources for future wars and operations, people familiar with the matter said on Tuesday. The debate over the theaterisation model, which moved to the back-burner after India's first chief of defence staff (CDS) General Bipin Rawat was killed in a helicopter crash last December, was reignited last week when IAF chief Air Chief Marshal Vivek Ram Chaudhari fully backed close coordination between all elements of the armed forces to counter a range of aerial threats, but said the creation of a separate air defence command "may prove counterproductive".

The model under discussion seeks to set up four new integrated commands for synergy in operations — two land-centric theatres, an air defence command, and a maritime theatre command. To be sure, the air force's concerns about the theaterisation model, including the air defence command, are not new, and have been flagged at different times by Chaudhari's predecessors too. "The air chief has expressed a view. There should be a discussion on it to find

a solution to take theaterisation forward. The military reform is a work in progress," said a senior officer, one of the people cited in the first instance, who asked not to be named. Chaudhari, who is also the officiating chairman of the chiefs of staff committee, argued last week that air defence operations were closely related to offensive aerial operations, and separating the two could affect the execution of any joint strategy.

"IAF has multiple aircraft, including the Rafale and Sukhoi-30s, which can perform multiple roles in the same mission. They can be used for offensive and air defence missions. Segregating the aircraft for strike and air defence roles will be counterproductive and lead to under-utilisation of potent and costly assets," said Air Marshal Anil Chopra (retd), director general, Centre for Air Power Studies, backing the argument that a separate air defence command was not operationally viable. There should be full consensus within the three services before the final theaterisation model is rolled out for maximum joint combat effectiveness, he said. "Rushed implementation is best avoided. Timelines can always be revised." In July 2021, Chaudhari's predecessor, Air Chief Marshal RKS Bhadauria, flagged concerns about the theaterisation model, arguing that it was critical to first get the structure right, even as Rawat gave out details of the plan to achieve jointness and brushed aside the air force's reservations.

While IAF's reservations are not new, the air chief's latest comments indicate that differences over what the joint structures should be like still need to be ironed out, said military affairs expert Lieutenant General DS Hooda (retd). It is also critical to appoint the next CDS at the earliest to steer military reforms, Hooda added. Rawat was spearheading the military's theaterisation drive to enhance the effectiveness of the armed forces and reshape the conduct of future operations. His demise seven months ago was seen as a setback to the ongoing military reforms. The government had given Rawat, who took charge as CDS on January 1, 2020, the mandate to bring about integration of the three services in a three-year time frame (by January 2023). The reform was, however, moving behind schedule. At the time of his death, the raising of theatre commands was projected to begin only in 2023-24.

"It's clear more discussions are needed and the three services have to be fully on board. The theaterisation reform has to be driven by CDS as the services tend to have their specific interests. If even CDS cannot find a solution, the political leadership will have to get involved to build consensus and drive the reform," said Hooda. The armed forces currently have 17 single-service commands spread across the country. The army and IAF have seven commands each, while the navy has three. Creating theatres would involve merging the existing commands.

The theaterisation drive slowed down after Rawat's death and providing it impetus will be one of the top priorities for his successor, officials said. The next CDS could be one of the three serving chiefs, any serving three-star officer, any retired chief who is below 62, or any retired three-star officer also below the same age, after the government in June amended the Army, Air Force and Navy rules to broaden the pool from which the CDS will be selected.

https://www.hindustantimes.com/india-news/spotlight-on-theaterisation-again-as-more-delays-loom-101658255584380.html

Tue, 19 Jul 2022

23 Years After Kargil War, India's Defence Reforms See an Upsurge Under PM Modi

By: Rasal Singh

Twenty-three years have passed since the day, July 26, 1999, when India emerged victorious in the Kargil war. On Kargil Vijay Diwas, the nation pays homage to the 527 soldiers martyred and over 1,100 soldiers wounded at the Kargil heights in the nearly three-month-long conflict with Pakistan from May-July 1999. On this day, the brave soldiers of the Indian Army, fighting against insurmountable odds, successfully restored a situation that had the potential of escalating into a nuclear holocaust. The situation was contained by a mature and restrained response under the leadership of then prime minister Atal Bihari Vajpayee that won international acclaim and gave India, not only a military victory, but also a moral ascendancy over Pakistan.

The remembrance and homage to the sacrifice and valour of India's martyrs in Kargil on 'The Kargil Vijay Diwas' will be in the right spirit if we can affirmatively say it won't happen again. However, whenever security reversals occur, gaps in our security system get exposed, especially in critical areas, the focus is too much on dealing with crises based on past pretexts, rather than future objectives. Thus, there are flaws in our security systems that need to be addressed. No adversary, especially a defeated one, ever employs the same strategy as they had in the past. What India must be prepared for is the revenge of a wily adversary who has time and again witnessed defeats at our hands yet continues to seek retribution.

e 1999 Kargil War was triggered by a territorial incursion by Pakistani military forces in the winter of 1998-99 across the Line of Control (LoC). It all started when the then overambitious Pakistan army chief, General Pervez Musharraf, conspired with his 'clique of generals'. The plan aimed at targeting the supposedly unimportant Kargil sector to interdict the Srinagar-Zojila-Kargil Road so that the maintenance of Ladakh and, by implication, of the Indian Army deployment at Siachen glacier would become near impossible. The intrusions would further give Pakistan control over substantial tracts of strategic land area across the LoC, thereby, enabling Islamabad to negotiate from a position of strength.

The reprehensible designs of a pugnacious neighbour (Pakistan) to violate the territorial integrity of the nation were impeded by a full-on combined military action, which involved all forces in cohesion and has no parallel in the chronicles of military history. Known as 'Operation Vijay', it was a series of attritional battles fought by the Indian forces at heights of 16,000-18,000 feet to evict the Pakistan Army's intrusion across the Line of Control on a frontage of almost 130 km.

Wars are not fought only by the armed forces, but by the entire nation, the government and all its organs, the political class, media, and people in an integrated and unified manner. The Kargil war was one such event that unified the nation. The political, diplomatic and military insights gained during the conflict have tremendous learning value for our politico-military structures and processes. Over the past decade, the Indian military has incessantly articulated the need to fight a

"two-front war"- an understatement signalling a shift from the Pakistani border towards focusing more broadly on the threat posed by China.

The Indian military faced its most serious military crisis with China in over 50 years. Chinese troop deployment in 2020-21 amid the pandemic surprised the Indian military, and clashes along the disputed border led to both Indian and Chinese casualties. While there has been some drawdown of forces, the crisis is by no means over. In the wake of the Kargil War in 1999, India also started seriously thinking of reforming and modernising its defence forces and command and control structures, while the Ladakh crisis highlighted the importance of new-age technologies, primarily drones and cyber warfare, to the Indian military.

Going by data from the Stockholm International Peace Research Institute, India has the distinction of being the world's largest arms importer over the past four decades. This makes it extremely vulnerable to external influence in times of war. Further, achieving some level of self-sufficiency in defence production will not materialise quickly. Rather, it will take decades and tremendous efforts to get it down to the more respectable figure of producing 70% of our defence requirements and importing just 30%. It was with this purpose of learning lessons and sharpening our higher defence management that the Kargil Review Committee was formed in the aftermath of the war. While the past governments have acknowledged this problem, their policy remedies have proven to be ineffective.

ATMANIRBHAR BHARAT

However, the present Modi government has placed emphasis on building India's domestic defence industry. Under the Atmanirbhar Bharat initiative, the current dispensation has prioritised defence production. Despite opposition from labour unions, the government has gone ahead with politically contentious issues such as the corporatisation of ordnance factories. Crucially, policies favour both state-owned and private sector defence enterprises amid an ongoing effort to encourage foreign firms to participate in this sector. Perhaps, the biggest achievement has been a mindset change engineered within the military and in the defence industry towards working with each other. Previously, this relationship was marked by finger-pointing, mistrust, mutual allegations of corruption, and even incomprehension. Now, these stakeholders are encouraged to work together, and the private sector is no longer imagined as a den of vice. The government has also pushed the defence industry to focus on exports, which, according to one count, have grown by over 700% from 2016 to 2020.

L&T, in partnership with Korea's Samsung, had procured a Rs 5,400-crore order to manufacture 100 artillery guns (155/52 mm K-9 Vajra tracked SP) and is also going to manufacture the Lakshya-1 and Lakshya-2 pilotless target aircraft with the Defence Research and Development Organisation (DRDO). The DRDO has tied up with Bharat Forge and General Dynamics to manufacture FICVs and Tata Strategic Division is joining hands with Airbus Industries to manufacture medium transport aircraft. Reliance Industries, Mahindra Defense Systems, Dynamatic Technologies, TVS Logistics, MKU, and others have also entered the defence market for manufacture. Two defence industrial zones are also coming up, which augurs well for the Make in India initiative. Further, several key purchases that were pending for years were made. Be it the new SiG 716 rifles from the US for the infantry, the Rafale jets from France for the Air Force or the Chinook heavy lift and Apache attack helicopters, or the S 400 air defence system from Russia, the Modi government has pushed for better equipment.

THE REFORMS

Among a slew of reforms that the Kargil Review Committee recommended, one pertained to the recruitment practices of the armed forces. It stated: “The Army must be young and always fit. Therefore, instead of the present practice of having 17 years of colour service (as has been the policy since 1976), it would be advisable to reduce the colour service to a period of seven to ten years and, thereafter, release these officers and men for service here.” Not just the Kargil committee, the Indian Army had also proposed a recruitment scheme like the Agnipath scheme to save manpower cost. In 2020, the Army had proposed “tour of duty” scheme to recruit youths for three years. The current scheme has several similarities with this proposal, while the service term has been fixed at four years instead of three.

The Agniveer recruitment reform brought by the current dispensation must be contextualised in the backdrop of the larger canvas of defence reforms and a reorganisation of the armed forces into theatre commands to promote jointness and synergy. These include the appointment of a Chief of Defence Staff (CDS), establishment of the Department of Military Affairs (DMA), implementation of One Rank One Pension after 40 years, establishment of the Defence Space and Cyber Agencies, Special Operations Division, and the corporatisation of the Ordnance Factories (OFs) into seven DPSUs. Furthermore, with active border disputes with two hostile neighbours that have led to hand-to-hand combat in recent years, the need for a young force, particularly for the Indian army, could hardly be ignored. Thus, the Agnipath scheme heralds a new era of bold reforms to strengthen India’s defence preparedness. This recruitment reform will help in right-sizing the armed forces and is accepted globally by many countries. Further, considering Beijing’s expansionist agenda, it will certainly tend to increase more military pressure on the disputed border. According to experts, the Agnipath scheme can prove to be a masterstroke to answer China, as India’s youth and tech-savy Agniveer, will prove to be a real threat to the dragon on the LAC.

India has come a long way from what we were in 1999, but there is still a great deal of work ahead of us to see that our nation is secure. Robust higher defence management is critical to ensure that the Indian military is well-equipped, trained, and has clarity on its broader military objectives from the civilian leadership. These go to the issue of civil-military relations, security strategy, and better synergy and jointness among the three military services. The current political dispensation in the past few years has not only focused on the modernisation of the armed forces on a priority basis through fast-track acquisitions, but has made transformative changes in policy initiatives to increase the domestic defence industry. Make in India initiatives aimed at ensuring an “India First” policy are in keeping with India’s aspirations to fulfil its destiny as a major power in the 21st century. Further, the future of warfare entails a lighter human footprint, with soldiers equipped with state-of-the-art weaponry, supported by cutting-edge technology to fight a war in a highly informative environment.

Agnipath is a much-needed reform as it has molded into the imperatives of the fifth generation/ hybrid warfare. These radical reforms were long overdue and are in the interest of the country’s preparedness in the face of emerging threats. This momentum will have to be sustained, for which an effective institutionalised interface between the Ministry of Defence (MoD), the services, and the private sector is required at the policy-making level.

https://www.news18.com/news/opinion/23-years-after-kargil-war-indias-defence-reforms-see-an-upsurge-under-pm-modi-5585401.html

THE ECONOMIC TIMES

Tue, 19 Jul 2022

India-China Military Talks to Resolve Ladakh Standoff 'Constructive, Forward-Looking', Says Beijing

China on Tuesday termed as "constructive and forward-looking" the 16th round of Sino-India talks to resolve the outstanding issues on the remaining friction points in the eastern Ladakh border and said a joint statement issued by both sides commented "positively" about the meeting. The latest round of military-level talks took place on Sunday at the Chushul Moldo meeting point on the Indian side of the LAC (Line of Actual Control). The Indian delegation at the talks was led by Lt-Gen Anindya Sengupta, the commander of the Leh-based 14 Corps, while the Chinese team was headed by South Xinjiang Military District Chief Major General Yang Lin. China-India Corps Commander Level Meeting was held in a "constructive and forward-looking manner", Chinese Foreign Ministry spokesman Zhao Lijian told a media briefing here while replying to the question that there was no breakthrough at the talks. "They had a candid and in-depth exchange of views..., in keeping with the guidance provided by the State Leaders to work for the resolution of the remaining issues at the earliest," Zhao said.

The two sides agreed to maintain the security and stability on the ground in the Western Sector, he said, adding that the two sides also agreed to stay in close contact and maintain dialogue through military and diplomatic channels and work out a mutually acceptable resolution of the remaining issues at the earliest. "A joint press release was issued by both sides which commented positively on the meeting," he said. About reports that India had lodged a protest over Chinese aircraft which flew close to contested border areas, he said "I do not have information about the specific question you raised"."I want to stress that China always conducts normal activities in the border areas in accordance with relevant agreements signed between China and India. In the meantime, we always ask the Indian side to abide by these agreements," he said. The state-run PLA Daily, the official newspaper of the Chinese military, reported on Monday actual combat-oriented aerial exercises by the Chinese Air Force at a high altitude on the "northwest border" in the first 10 days of July. "The situation in the air is constantly changing. If you fail to lock down and launch an attack within a short 'time window', you may be shot down by your opponent at any time," it quoted one pilot as saying.

It is understood that this method of warfare has been tried and proved many times in the past, but failed in the last exercise, the report said. "The effectiveness of combat skills must be tested on the training ground," it said. Since he came to power in 2012, Chinese President Xi Jinping who also heads the military has been pressing the People's Liberation Army (PLA) to carry out real combat exercises with troops designated as rival forces. Also, the Hong Kong-based South China Morning Post reported on Tuesday that China's military tested advanced rocket launch system at high altitude. The PLA used the PCL191 multiple launch rocket system - which is mounted on a

truck - to hit a target several kilometres away at a desert shooting range in the west of China during a recent test, the post quoted a state TV report.

The advanced, long-range rocket launch system made its public debut at China's National Day parade in October 2019. According to the Chinese military magazine Modern Ships, it can carry eight 370mm rockets - each with a range of 350km or two 750mm Fire Dragon 480 tactical ballistic missiles - each capable of flying up to 500km, the report said. The 15th round of military dialogue took place on March 11 and it too failed to yield any significant outcome. It is learnt that the Indian delegation also sought resolution of pending issues in Depsang Bulge and Demchok. India has been consistently maintaining that peace and tranquillity along the LAC were key for the overall development of the bilateral ties. The 16th round of military talks was held 10 days after External Affairs Minister S Jaishankar met his Chinese counterpart Wang Yi in Bali.

At the one-hour meeting on the sidelines of a conclave of foreign ministers of the G20 nations, Jaishankar conveyed to Wang the need for early resolution of all the outstanding issues in Eastern Ladakh. The eastern Ladakh border standoff erupted on May 5, 2020, following a violent clash in the Pangong lake areas. Both sides gradually enhanced their deployment by rushing in tens of thousands of soldiers as well as heavy weaponry. As a result of a series of military and diplomatic talks, the two sides completed the disengagement process last year on the north and south banks of the Pangong lake and in the Gogra area. Each side currently has around 50,000 to 60,000 troops along the Line of Actual Control (LAC) in the sensitive sector.

https://m.economictimes.com/news/defence/india-china-military-talks-to-resolve-ladakh-standoff-constructive-forward-looking-says-beijing/amp_articleshow/92986534.cms

THE HINDU

Tue, 19 Jul 2022

China Steps Up LAC Air Drills as Talks Stall

China on After Chinese aircraft flew close to contested areas along the LAC, India scrambled aircraft in response and also raised the matter with the Chinese side, according to reports. Mr. Zhao did not comment on the air drills, but said Sunday's talks saw both sides "agree to maintain the security and stability on the ground in the Western Sector" and "stay in close contact and maintain dialogue through military and diplomatic channels and work out a mutually acceptable resolution of the remaining issues at the earliest". Tuesday defended its stepped-up military activity near the Line of Actual Control (LAC) as "normal", amid concerns from India on Chinese aircraft flying close to the contested areas even as border talks remain in a stalemate.

"I want to stress that China always conducts normal activities in the border areas in accordance with relevant agreements signed between China and India," Foreign Ministry spokesperson Zhao Lijian said, in response to questions about the Chinese People's Liberation Army's (PLA) air drills in late June and early July in border areas. The 16th round of talks between military commanders ended without a breakthrough or agreement to disengage at Patrolling Point 15 in Hot Springs. China has also been reluctant to even discuss the two other remaining disputes at

Demchok and Depsang, while India has made clear its stand of full disengagement from all the friction areas.

In a reflection of Beijing's priorities, on Monday, the official PLA Daily did not mention the talks but carried a report on its front page on air force drills being undertaken by the Western Theatre Command, which is responsible for the India border, in an unspecified high-altitude border area. The aim, the report said, was to increase combat efficiency. Separately, the Hong Kong-based South China Morning Post reported on Tuesday that the PLA had carried out tests of its new rocket launch system with precision strike capability, the PCL191 system, at high-altitude areas with the aim of deploying them along the India border.

Artillery brigade

"The system was being used by an artillery brigade in the Western Theatre Command's Xinjiang military district in April last year, according to the official PLA Daily," the report said. "The brigade was deployed to an area 5,200 metres (17,000 feet) above sea level in the Himalayas, near the border with India," it said. The aim was to show that "the PCL191 brigade could be deployed anywhere in the country, from the coast to the Himalayas, and take on challenges like the border dispute with India, or even a Taiwan contingency", military commentator Song Zhongping told the Post.

https://www.thehindu.com/news/international/china-steps-up-lac-air-drills-as-talks-stall/article65658830.ece

IDN INDIAN DEFENCE NEWS
Global Defence, Aerospace & Security

Wed, 20 Jul 2022

China's New Variant of J-10 Fighter Spotted; Social Media Calls It Regular Chinese Propaganda

Photos of a new configuration of China's primary medium-weight fighter, the J-10, possibly representing a new J-10D model, have begun circulating online. The images show the aircraft with a relatively familiar modification — an enlarged fairing running along the length of the jet's spine reports Emma Helfrich, Tyler Rogoway of TheDrive. Similar to specific export variants of the F-16D and F, the snapshots show the J-10 in a prominent dorsal "big spine" configuration. This addition could potentially house a variety of systems, including expanded countermeasure and electronic warfare systems, as well as communications and passive sensors, not to mention the cooling needed to support those features. It could also potentially provide additional space for fuel, but this is less likely. The extra room is especially important for two-seat fighter derivatives that usually give up extra space and fuel for a second crewman. This means the J-10D can house additional electronics and fuel, helping the jet to carry more electronic warfare equipment.

The internet, on the other hand, is not convinced with the images and says it is a standard Chinese disinformation/propaganda tactic. On the other hand, a popular Pakistani channel analysing Chinese defence aerospace issues, claims the image for real and is a modified J-10B

may be used as a testbed. The leaked images show the jet with a single-piece canopy design enhancing the stealth capabilities, while the delta wing appears straight unlike the twisted surface on the older J-10, J-10B and J-10C variants. This, again, adds to stealth, drag and aerodynamic abilities. Considering the recent appearance of the big spine, that mission is now suspected by some to be in the realm of electronic warfare and potentially suppression of enemy air defences (SEAD). China is investing heavily in this space of its tactical jet portfolio, with the J-16 electronic attack variant based on the Flanker heavy fighter being rolled out not too long ago. It also uses the 'D' designation — J-16D.

The J-10D will most likely get the avionics from the J-10C, which has an Active Electronically Scanned Array (AESA) radar, with 1,200 TR (transmitter/receiver) modules. The Dassault Rafale gets RBE2 AESA radar with 838 TR modules but has a more advanced real-time generation of three-dimensional maps for terrain-following management system, extended range capabilities supporting low-observable target detection and greater waveform agility for SAR (Synthetic Aperture Radar) imaging and improved resistance to jamming. Unlike the Chinese J-10 the Rafale is equipped with the OSF (Optronique secteur frontal) long range optoelectronics system. With its narrow field, the visible waveband capability is truly valuable to identify targets in situations where visual contact is required by the rules of engagement. It allows target tracking, through IR (infra-red search) and visual sensors. The J-10D can be counted as a Gen 4 jet, keeping it less aligned with Rafale and TEJAS from India and F-16 from the US but it would be supplementing the J-20s.

Being that China exported a number of J-10C fighters to Pakistan just this year, some are theorizing that the modification is one being carried out at the request of the Pakistani Air Force, which already enjoys a similar setup on their aforementioned F-16Ds. This could manifest itself in new build aircraft destined for Pakistan or possibly as a retrofit option. By Pakistan acquiring J-10C, the PAF has got another frontline fighter apart from the F-16s. India, on the other hand, has the deadly Sukhoi Su-30MKIs, Mirage-2000s, MiG-29s and the Rafale fighters. Pakistan's JF-17 which is used for point defence, ground attack is no match to India's advanced TEJAS and hence, Pakistan would be eagerly waiting for the J-10D to go in production

http://www.indiandefensenews.in/2022/07/chinas-new-variant-of-j-10-fighter.html?m=1

IDN INDIAN DEFENCE NEWS
Global Defence, Aerospace & Security

Wed, 20 Jul 2022

India-Bound: Pratt & Whitney to Open Bengaluru Engineering Centre in 2023

All the major global aerospace companies are expected to make key announcements at this year's Farnborough Air Show, and Pratt & Whitney made a few of its own on the first day. Among them was its plan to set up an engineering centre in India, strengthening its ties with the country and making use of its vast engineering resources reports Gaurav Joshi of Simple Flying.

New Engineering Centre In Bangalore

Pratt & Whitney announced on Monday that it is setting up a state-of-the-art India Engineering Centre (IEC) in Bangalore. The US aerospace manufacturer made the announcement on the sidelines of the ongoing Farnborough Air Show and said that the centre is slated to commence operation in January 2023. The IEC will focus on providing contract engineering services and is expected to employ 500 engineers and professionals when fully staffed. Geoff Hunt, Senior Vice President, Engineering, Pratt & Whitney, commented, “Pratt & Whitney’s India Engineering Centre will be the first-of-its-kind investment for our company in India. The IEC will help Pratt & Whitney leverage the engineering skills our future Indian workforce will deliver, as Pratt & Whitney continues to advance the world’s only fielded geared turbofan and develop sustainable propulsion for the next generation of propulsion.”

Co-Located With Supply Chain Support Centre

The IEC will be co-located in Yelahanka, Bangalore where the company established the Pratt & Whitney India Capability Centre (ICC) earlier this year. The ICC is a world-class global supply chain support and operations centre, established in 2022 as part of United Technologies Corporation India Pvt Ltd (UTCIPL), employing nearly 200. The latest engineering centre will be integrated with Pratt & Whitney's global engineering operations and will work closely with the US, Canada, Puerto Rico, and Poland centres. The IEC has already started recruiting its first set of engineers and professionals. Paul Weedon, executive director, Engineering, Pratt & Whitney Canada, has also welcomed the announcement and said that the IEC will allow them to synergize with existing Pratt & Whitney Operations' capabilities in India.

Pratt & Whitney In India

Pratt & Whitney has had a long-standing presence in India for almost seven decades. Its association with the country goes back to 1960 when Air India received delivery of its first Boeing 707 powered by Pratt & Whitney's JT3D engines. Currently, its product portfolio in India spans across commercial aviation, regional/ business aviation, and military applications. Regarding the IEC, Ashmita Sethi, managing director of UTCIPL, said, “Pratt & Whitney’s growth in the country represents our strong ties and deep respect for the skills India offers, skills needed for the future of aviation.” Indeed, with India slated to become the third-biggest aviation market soon and with all its engineering talent, Pratt & Whitney's increasing presence in the country seems to be a step in the right direction.

http://www.indiandefensenews.in/2022/07/india-bound-pratt-whitney-to-open.html?m=1

DefenseNews

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US Marine Corps Successfully Tests Iron Dome-Based Air Defense

By Seth J. Frantzman

The U.S. Marine Corps has successfully tested an air-defense package incorporating Israel's Iron Dome Tamir missile, according to Israel's Ministry of Defense. "This test has proven the Iron Dome Tamir interceptor and associated ground components can be integrated quickly and efficiently in any relevant defense architecture and intercept various aerial threats successfully in complex and advanced scenarios," said Moshe Patel, the head of the Israel Missile Defense Organization. According to a statement from the Israel Ministry of Defense, the test involved the Marine Corps' Medium-Range Intercept Capability (MRIC) prototype hitting several simultaneously-launched cruise missile representative targets coming from different directions and angles at White Sands Missile Range in New Mexico.

"At its peak, numerous in-air targets, each with its own unique flight trajectory and velocity, surrounded the MRIC prototype," a Marine Corps statement reads. "Upon firing, MRIC successfully hit each target using the Tamir missile." Patel said Israel "looks forward to further partnerships with the U.S. armed forces on Air and Missile Defense." The most recent test followed another one that took place in December 2021. Iron Dome maker Rafael said in a statement that the test results were in line with prior simulations done by Marine Corps analysts.

Shachar Shohat, a vice president at the company, told Defense News that the Tamir interceptor can easily be integrated with other radar and command and control systems. The system's open architecture capability enables the interceptor, which called SkyHunter in the U.S. military under a joint venture with Raytheon, to be plugged into various setups, he explained. Rafael was contracted for the engineering and adaptation of Iron Dome to Marine Corps requirements and associated testing support. The Tamir interceptor is capable of shooting down cruise missiles, unmanned aerial systems, rockets, artillery, and mortar threats, the Israel Ministry of Defense said.

https://www.defensenews.com/land/2022/07/19/us-marine-corps-successfully-tests-iron-dome-based-air-defense/

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Grain Shape Influences Liquefaction of Sand, A Major Earthquake Hazard

Scientists have found that the shape of sand grains influences the liquefaction of sand, one of the major factors behind the collapse of structures during earthquakes. Liquefaction of sand is a phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking or other rapid loading and leads to the collapse of structures resting on the liquefied ground. As natural sand with regular shape liquefies easily, the scientists have concluded that natural sand used in structures like slopes and retaining walls can be replaced with irregular manufactured sand to improve the stability and sustainability. Though the qualitative effects of grain size and grain shape on the resistance of sand to liquefaction are well established, quantitative correlations between them are elusive. Most of the studies in this direction used conventional methods to quantify the grains' size and shape, including sieve analysis and visual observations.

In a breakthrough study, researchers at the Indian Institute of Science (IISc) used digital image analysis for grain shape characterizations and related them to the liquefaction potential of the sands. They found a strong relation between the two. This is because the shear force (unaligned forces pushing one part of a body in one specific direction and another part of the body in the opposite direction) required to break the inter-particle locking is more for the grains with relatively irregular shapes. Microscopic images of sand particles were analyzed through computational algorithms developed in MATLAB (MATrix LABoratory), which is a high-performance computing platform for analyzing data to determine their shape parameters. Cyclic simple shear tests in which specimens are subjected to simulated earthquake conditions of alternate cycles of tension and compression were carried out on sand samples to determine their potential to liquefy under specific earthquake conditions.

For these tests, the scientists used the cyclic simple shear test setup (GCTS USA make) procured through Department of Science and Technology – Fund for Improvement of S&T Infrastructure in Universities and Higher Educational Institutions (FIST) funding. The study has been accepted for publication in Indian Geotechnical Journal, for carrying out cyclic simple shear test.The research team found that glass beads, which have regular shape with higher roundness and sphericity, liquefied first in the cyclic shear tests, while river sand, whose roundness and sphericity (how much of an even sphere it is) fall between glass beads and manufactured sand, liquefied next, followed by manufactured sand, whose shape is relatively irregular. These tests clearly highlighted the important effects of grain shape on the liquefaction potential of granular soils.

As the shape of the particles becomes irregular, with their overall form deviating from that of a sphere and their corners becoming sharper, they get interlocked with each other during shearing. Interlocking provides additional resistance to shear, and hence the tendency to get separated from each other to float in the fluid becomes lesser for particles with irregular shapes. Further, tortuosity, or the deviation in the fluid path, increases with the irregular shape of the particles. Greater tortuosity decreases water flow through the pore network and decreases the chance for water to separate the particles.

https://www.pib.gov.in/PressReleasePage.aspx?PRID=1842680

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Scientists Find an Exotic Black Hole Deemed A 'Needle in a Haystack'

Astronomers have spotted in a galaxy adjacent to our Milky Way what they are calling a cosmic "needle in a haystack" – a black hole that not only is classified as dormant but appears to have been born without the explosion of a dying star. Researchers said on Monday this one differs from all other known black holes in that it is "X-ray quiet" – not emitting powerful X-ray radiation indicative of gobbling up nearby material with its strong gravitational pull – and that it was not born in a stellar blast called a supernova. Black holes are extraordinarily dense objects with gravity so intense not even light can escape. This one, with a mass at least nine times greater than our sun, was detected in the Tarantula Nebula region of the Large Magellanic Cloud galaxy and is located about 160,000 light years from Earth. A light year is the distance light travels in a year, 5.9 trillion miles (9.5 trillion km).

An extremely luminous and hot blue star with a mass about 25 times that of the sun orbits with this black hole in a stellar marriage. This so-called binary system is named VFTS 243. The researchers believe the companion star eventually also will become a black hole and could merge with the other one. Dormant black holes, thought to be relatively common, are hard to detect because they interact very little with their surroundings. Numerous prior proposed candidates have been debunked with further study, including by members of the team that uncovered this one. "The challenge is finding those objects," said Tomer Shenar, a research fellow in astronomy at Amsterdam University, lead author of the study published in the journal Nature Astronomy. "We identified a needle in a haystack."

"It's the first object of its kind discovered after astronomers have been searching for decades," said astronomer and study co-author Kareem El-Badry of the Harvard & Smithsonian Center for Astrophysics. The researchers used six years of observations from the European Southern Observatory's Chile-based Very Large Telescope. There are different categories of black holes. The smallest, like the newly detected one, are so-called stellar-mass black holes formed by the collapse of massive individual stars at the ends of their life cycles. There also are intermediate-mass black holes as well as the enormous supermassive black holes residing at the center of most galaxies. "Black holes are intrinsically dark objects. They do not emit any light. Therefore, in

order to detect a black hole, we usually look at binary systems in which we see one luminous star moving around a second, not-detected object," said study co-author Julia Bodensteiner, a postdoctoral research fellow at the European Southern Observatory in Munich.

It is typically assumed that the collapse of massive stars into black holes is associated with a powerful supernova explosion. In this case, a star perhaps 20 times our sun's mass blew some of its material into space in its death throes, then collapsed in on itself without an explosion. The shape of its orbit with its companion offers evidence for the lack of an explosion. "The orbit of the system is almost perfectly circular," Shenar said. Had a supernova occurred, the blast's force would have kicked the newly formed black hole in a random direction and yielded an elliptical rather than circular orbit, Shenar added. Black holes can be mercilessly ravenous, guzzling any material – gas, dust and stars – wandering within their gravitational pull.

"Black holes can only be mercilessly ravenous if there is something close enough to them that they can devour. Usually, we detect them if they are receiving material from a companion star, a process we call accretion," Bodensteiner said. Shenar added, "In so-called dormant black hole systems, the companion is far enough away that the material does not accumulate around the black hole to heat up and emit X-rays. Instead, it is immediately swallowed by the black hole."

https://indianexpress.com/article/technology/science/scientists-find-an-exotic-black-hole-deemed-a-needle-in-a-haystack-8038378/

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New Technology Gives AI Human-Like Eyes

The technology might result in highly developed artificial intelligence that can instantaneously understand what it sees and has uses in robotics and self-driving cars. Researchers at the University of Central Florida (UCF) have built a device for artificial intelligence that replicates the retina of the eye. The research might result in cutting-edge AI that can identify what it sees right away, such as automated descriptions of photos captured with a camera or a phone. The technology could also be used in robots and self-driving vehicles. The technology, which is described in a recent study published in the journal ACS Nano, also performs better than the eye in terms of the range of wavelengths it can perceive, from ultraviolet to visible light and on to the infrared spectrum.

Its ability to combine three different operations into one further contributes to its uniqueness. Currently available intelligent image technology, such as that found in self-driving cars, needs separate data processing, memorization, and sensing. The researchers claim that by integrating the three procedures, the UCF-designed device is much faster than existing technology. With hundreds of the devices fitting on a one-inch-wide chip, the technology is also quite compact. "It will change the way artificial intelligence is realized today," says study principal investigator Tania Roy, an assistant professor in UCF's Department of Materials Science and Engineering

and NanoScience Technology Center. “Today, everything is discrete components and running on conventional hardware. And here, we have the capacity to do in-sensor computing using a single device on one small platform.”

The technology expands upon previous work by the research team that created brain-like devices that can enable AI to work in remote regions and space. “We had devices, which behaved like the synapses of the human brain, but still, we were not feeding them the image directly,” Roy says. “Now, by adding image sensing ability to them, we have synapse-like devices that act like ‘smart pixels’ in a camera by sensing, processing, and recognizing images simultaneously.” For self-driving vehicles, the versatility of the device will allow for safer driving in a range of conditions, including at night, says Molla Manjurul Islam ’17MS, the study’s lead author and a doctoral student in UCF’s Department of Physics. “If you are in your autonomous vehicle at night and the imaging system of the car operates only at a particular wavelength, say the visible wavelength, it will not see what is in front of it,” Islam says. “But in our case, with our device, it can actually see in the entire condition.”

“There is no reported device like this, which can operate simultaneously in ultraviolet range and visible wavelength as well as infrared wavelength, so this is the most unique selling point for this device,” he says. Key to the technology is the engineering of nanoscale surfaces made of molybdenum disulfide and platinum ditelluride to allow for multi-wavelength sensing and memory. This work was performed in close collaboration with YeonWoong Jung, an assistant professor with joint appointments in UCF’s NanoScience Technology Center and Department of Materials Science and Engineering, part of UCF’s College of Engineering and Computer Science. The researchers tested the device’s accuracy by having it sense and recognize a mixed wavelength image — an ultraviolet number “3” and an infrared part that is the mirror image of the digit that were placed together to form an “8.” They demonstrated that the technology could discern the patterns and identify them both as a “3” in ultraviolet and an “8” in infrared.

“We got 70 to 80% accuracy, which means they have very good chances that they can be realized in hardware,” says study co-author Adithi Krishnaprasad ’18MS, a doctoral student in UCF’s Department of Electrical and Computer Engineering. The researchers say the technology could become available for use in the next five to 10 years.

https://scitechdaily.com/new-technology-gives-ai-human-like-eyes/amp/

PHYS.ORG

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New Model Predicts How Temperature Affects Life from Quantum to Classical Scales

Every biological process depends critically on temperature. It's true of the very small, the very large, and every scale in between, from molecules to ecosystems and across every environment. A general theory describing how life depends on temperature has been lacking—until now. In a paper pubished in the Proceedings of the National Academy of Sciences, researchers led by Jose

Ignacio Arroyo, a Santa Fe Institute Postdoctoral Fellow, introduce a simple framework that rigorously predicts how temperature affects living things, at all scales. "It is very fundamental," says SFI External Professor Pablo Marquet, an ecologist at the Pontifica Universidad Catolica de Chile, in Santiago. Marquet, Arroyo's Ph.D. thesis advisor, also worked on the model. "You can apply this to pretty much every process that is affected by temperature. We hope it will be a landmark contribution."

Marquet notes that such a theory could help researchers make accurate predictions in a range of areas, including biological responses to climate change, the spread of infectious diseases, and food production. Previous attempts to generalize the effects of temperature on biology have lacked the "big picture" implications built into the new model, says Marquet. Biologists and ecologists often use the Arrhenius equation, for example, to describe how temperature affects the rates of chemical reactions. That approach successfully approximates how temperature influences some biological processes, but it can't fully account for many others, including metabolism and growth rate. Arroyo initially set out to develop a general mathematical model to predict the behavior of any variable in biology. He quickly realized, however, that temperature was a kind of universal predictor and could guide the development of a new model. He started with a theory in chemistry that describes the kinetics of enzymes, but with a few additions and assumptions, he extended the model from the quantum-molecular level to larger, macroscopic scales.

Importantly, the model combines three elements lacking in earlier attempts. First, like its counterpart in chemistry, it's derived from first principles. Second, the heart of the model is a single, simple equation with only a few parameters. (Most existing models require a plethora of assumptions and parameters.) Third, "it's universal in the sense that it can explain patterns and behaviors for any microorganisms or any taxa in any environment," he says. All temperature responses for different processes, taxa, and scales collapse to the same general functional form. "I think that our ability to systematize temperature response has the potential to reveal novel unification in biological processes in order to resolve a variety of controversies," says SFI Professor Chris Kempes, who along with SFI Professor Geoffrey West, helped the team bridge the quantum-to-classical scales.

The PNAS paper describes predictions from the new model that align with empirical observations of diverse phenomena, including the metabolic rate of an insect, the relative germination of alfalfa, the growth rate of a bacterium, and the mortality rate of a fruit fly. In future publications, Arroyo says, the group plans to derive new predictions from this model—many of which were planned for the first publication. "The paper was just getting too big," he says.

More information: José Ignacio Arroyo et al, A general theory for temperature dependence in biology, Proceedings of the National Academy of Sciences (2022).

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https://phys.org/news/2022-07-temperature-affects-life-quantum-classical.html