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The EurAsian Times

Fri, 18 Feb 2022

India's LCA Tejas steals the 'Thunder' as Sino-Pak JF-17 Jet again takes a back seat at Singapore Air Show

The Indian Light Combat Aircraft (LCA) — Tejas demonstrated 'exceptional flying capabilities' once again, this time at the Singapore Air Show 2022, which began on February 15. However, its regional rival, the Chinese-Pakistani JF-17 'Thunder' gave the aerial display a miss.

The flying displays are the most exciting and highly anticipated part of every major air show. LCA Tejas, which had enthralled the audience not too long ago at the Dubai Air Show made a stunning appearance in Singapore and the Indian Air Force tweeted and called it 'A Diamond In The Sky'.

The Indian Air Force Tejas performs at the opening ceremony of the Singapore Air Show on February 15, 2022.

However, the one aircraft that is usually pitted against Tejas did not participate in the air show. The JF-17 Thunder skipped the flypast once again even as Pakistan has been boastful about inducting the new Block III variant of the fighter jet.

The Chinese state-owned China National Aero-Technology Import & Export Corporation, however, displayed a variety of military aircraft, including JF-17 fighters, helicopters, and drones, at the air show that kicked off on February 15.

AVIC promoted the JF-17B Thunder twin-seat fighter trainer as its main product. The company also displayed the pure fighter version of the JF-17, the L-15 fighter trainer, the FTC-200G fighter trainer, and the K-8 trainer aircraft.

The JF-17 Thunder multirole fighter's adaptability for numerous mission sets was praised by the organization. The platform's flight performance characteristics at medium and low altitudes, integrated avionics, and armament systems were featured in a booklet. However, despite much pomp and vigor, the JF-17 Thunder was benched.

The Curious Case of JF-17 Withdrawal

The pullout of JF-17 Thunder from aerial displays or simply not participating in events that feature the LCA Tejas has become a pattern in the past few years.

At the Dubai Air Show 2021, Pakistan's JF-17 'Multi-Role Combat Aircraft,' which was supposed to be pitched against the Tejas, withdrew at the last minute for no cogent reason. It appeared to be an attempt at avoiding direct comparisons with the LCA Tejas, both at the ground and in the air.

This was a recurrence of the JF-17's sudden withdrawal from the Langkawi International Maritime and Aerospace Exhibition (LIMA) 2019, in which the Indian Tejas also took part. In the

Bahrain Air Show of 2016, where these two rival jets were given slots next to each other at the Tarmac for static display, the JF-17 did not show up due to reasons best known to its promoter.

Ever since the Bahrain Air Show of 2016, this Sino-Pak fighter jet has avoided being seen next to the Indian LCA that has become the poster aircraft of the Modi government's indigenization initiative and has gained great traction in the past few years.

However, it was perceived as heartburn in Pakistan as its 'Thunder' has been under the scanner owing to various technical concerns, especially with its engines, as previously explained by the EurAsian Times. This is also believed to be the reason behind Pakistan's purchase of JC-10 fighters from China.

Further, the JF-17 which was earlier seen as a major contender for the Malaysian LCA tender alongside India's Tejas was surprisingly dropped from the list of final contenders that featured only six names. Indian Tejas remains a frontrunner for the Malaysian contract.

LCA Tejas Vs Pakistani JF-17

The Tejas is a single-engine fourth-generation light combat aircraft designed by India's state-owned Hindustan Aeronautics Limited (HAL).

The aircraft was designed for the Indian armed forces by the Aeronautical Development Agency (ADA) in partnership with HAL's Aircraft Research and Design Centre (ARDC). In July 2016, the aircraft was commissioned into the Indian Air Force. The fighter jet is outfitted with a variety of cutting-edge avionics and weaponry.

The Tejas Mk-1A and Mk-2 are enhanced versions of the LCA. HAL secured a Rs 48,000-crore contract from India's Ministry of Defense (MoD) last year to provide 83 new Tejas Mk-1A fighter planes.

HAL gained confidence in the fighter jet's export potential as a result of this purchase. However, The EurAsian Times had previously analyzed the challenges Tejas faces in terms of foreign sales.

The JF-17, on the other hand, is a medium-sized multi-role fighter plane designed jointly by China's Chengdu Aircraft Corporation (CAC) and Pakistan Aeronautical Complex (PAC) to suit the Pakistan Air Force's airpower requirements.

The fighter jet is available in single and twin-seat versions, with a total length of 14.9 meters. The plane is 4.77m height, 9.45m wide, and has a 24.4m2 wing area. The JF-17's empty weight is 6,441 kilograms, its maximum take-off weight (MTOW) is 12,700 kilograms, its loaded weight is 9,100 kilograms, and its maximum landing weight is 7,802 kilograms. The fuel weight of the plane is 2,268kg.

The Klimov RD-93 turbofan engine or WS-13 turbofan engine with a dry thrust capacity of 49.4 kN and a thrust afterburner of 84.4 kN powers the JF-17. The fighter jet has a maximum speed of 2,205 kilometers per hour, a range of 3,480 kilometers, an operational radius of 1,352 kilometers, and a service ceiling of 16,920 meters.

The jet is equipped with 1 x 2 mm GSh-23-2 twin-barrel cannons, 57mm and 90mm unguided rocket pods, short-range AIM-9L/M, PL-5E, PL-9C, and beyond visual range (BVR) PL-12/SD-10 air-to-air missiles, and beyond visual range (BVR) PL-12/SD-10 air-to-air missiles. The MAR-1 anti-radiation missile, AM-39 Exocet anti-ship missile, and Ra'ad ALCM cruise missile are among the anti-surface missiles carried by the aircraft.

The JF-17 flew for the first time in 2003 and entered service in 2007. The Black Spider squadron was the first operational fighter fleet with 14 JF-17s inducted in 2010. The Block III prototype flew for the first time in 2020 and is now being inducted into Pakistan's Air Force.

While both aircraft have also had their share of hard times, the China-Pakistan joint product seems to be reeling under pressure and avoiding sharing the scene with its Indian counterpart.

https://eurasiantimes.com/indias-lca-tejas-steals-the-thunder-as-sino-pak-jf-17-jet-again-takes-a-back-seat-at-singapore-air-show/

asianet newsable

Fri, 18 Feb 2022

'Made in India' Tejas, the show-stopper at Singapore airshow 2022

LCA Tejas, which participated for the first time at the air show in Singapore, demonstrated its superior flying manoeuvres and capability that began on February 15.

By Anish Kumar

India's indigenous light combat aircraft Tejas was the show-stopper at the four-day Singapore airshow 2022 at the Changi Exhibition Center.

LCA Tejas, which participated for the first time at the air show in Singapore, demonstrated its superior flying manoeuvres and capability that began on February 15. IAF deployed three LCA Tejas at the show.

Three months ago, the country's homegrown aircraft LCA Tejas had participated during the Dubai air show in 2021 and enthralled the audience out there.

As per the expert, India is attempting to tap the light combat aircraft market in Southeast Asian nations. Tejas is a strong contender for the Malaysian Air Force's tender for 18 fighter jets.

LCA Tejas is a single-engined, highly agile, lightweight, and multi-role supersonic fighter aircraft. It has been designed for air combat and offensive air support with reconnaissance and anti-ship as its secondary roles.

Powered by a GE F404-GE-IN20 engine, the LCA Tejas can carry a payload of 3.5 tonnes.

Prior to this, LCA Tejas had participated in Bahrain International Air Show in 2016, Langkawi International Maritime and Aerospace Exhibition in 2019 in Malaysia, Dubai Air Show in 2021, and had displayed its skills.

Just after LIMA in 2019, the Malaysian Air Force had evinced interest in the LCA Tejas.

s[*https://newsable.asianetnews.com/india-defence/made-in-india-tejas-the-show-stopper-at-singapore-airshow-2022-r7g6r3*](https://newsable.asianetnews.com/india-defence/made-in-india-tejas-the-show-stopper-at-singapore-airshow-2022-r7g6r3)

नवभारत टाइम्स

Fri, 18 Feb 2022

DRDO और ISRO में क्या है अंतर, जानें इतिहास व महत्व

DRDO भारत सरकार के रक्षा मंत्रालय के लिए कार्य करती है जबकि ISRO भारत सरकार के अंतरिक्ष एजेंसी के लिए कार्य करता है।

By Neha Upadhyay

हाइलाइट्स

- ***DRDO का गठन 1958 में किया गया था और अंतरिक्ष गतिविधियां 1960 में शुरू हुईं।***
- ***DRDO का मिशन है आत्मनिर्भरता और सफल स्वदेशी विकास।***
- ***वहीं ISRO का मिशन है भारत के लिए अंतरिक्ष तक पहुंच प्रदान***

रक्षा अनुसंधान और विकास संगठन (DRDO) **भारत सरकार के रक्षा मंत्रालय में रक्षा अनुसंधान और विकास विभाग के तहत कार्य करने वाली प्रमुख एजेंसी है जबकि** ISRO **यानी भारतीय अंतरिक्ष एजेंसी भारत सरकार के अंतरिक्ष विभाग के तहत काम करती है। यह विश्व स्तर पर प्रतिस्पर्धी विज्ञान और**

प्रौद्योगिकी आधार स्थापित करने के लिए काम करता है। वहीं इसरो भारत के अंतरिक्ष कार्यक्रमों के लिए काम करता है। आइए जानते हैं दोनों के मध्य अंतर।

क्या है DRDO

रक्षा अनुसंधान और विकास संगठन यानी DRDO वह संगठन है जो भारत के लिए विश्व स्तर पर प्रतिस्पर्धी विज्ञान और प्रौद्योगिकी आधार स्थापित करने के लिए काम करता है। इसके साथ ही सशस्त्र बलों की आवश्यकताओं के अनुसार अत्याधुनिक हथियार प्रणालियों और उपकरणों से लैस करता है। DRDO की स्थापना 1958 में हुई जब भारतीय सेना के तकनीकी विकास प्रतिष्ठान (TDE) और तकनीकी विकास और उत्पादन निदेशालय (DTDP) को रक्षा विज्ञान संगठन (DSO) के साथ जोड़ा गया।

वर्तमान में संगठन के साथ 5000 से अधिक वैज्ञानिक और विभिन्न कर्मी कार्य कर रहे हैं। DRDO के काम में मिसाइलों और हथियारों के विकास से लेकर इलेक्ट्रॉनिक युद्ध प्रणाली तक विभिन्न परियोजनाएं शामिल हैं।

DRDO का महत्व

DRDO ने कई प्लेटफार्मों का उत्पादन किया है जैसे मिसाइलों की अग्नि और पृथ्वी श्रृंखला, हल्के लड़ाकू विमान, तेजासी, मल्टी बैरल रॉकेट लांचर, पिनाका वायु रक्षा प्रणाली, आकाशो रडार और इलेक्ट्रॉनिक युद्ध प्रणालियों की एक बड़ी खेप। इसके साथ ही आत्मनिर्भरता और सफल स्वदेशी विकास भी DRDO का लक्ष्य रहा है। मिसाइलों की अग्नि और पृथ्वी श्रृंखला। इनसे भारत की सैन्य शक्ति में भारी उछाल आया है और महत्वपूर्ण लाभ प्रदान किया गया है।

क्या है ISRO

ISRO यानी भारतीय अंतरिक्ष एजेंसी भारत सरकार के अंतरिक्ष विभाग के तहत काम करती है और इसका मुख्यालय बेंगलुरु, कर्नाटक में है।

ISRO इतिहास

अंतरिक्ष गतिविधियां भारत में 1960 के दशक में शुरू हुईं और भारतीय अंतरिक्ष कार्यक्रम के संस्थापक डॉ विक्रम साराभाई ने भारत से अंतरिक्ष मिशन शुरू करने का विचार रखा। INCOSPAR, भारतीय राष्ट्रीय अंतरिक्ष अनुसंधान समिति की शुरुआत तब डॉ साराभाई और डॉ रामनाथन ने की थी। यह 1975-76 के मध्य जब सैटेलाइट इंस्ट्रक्शनल टेलीविज़न एक्सपेरिमेंट (SITE) लॉन्च किया गया था और इसे दुनिया के सबसे बड़े समाजशास्त्रीय प्रयोग के रूप में देखा गया था। इसके बाद खेड़ा कम्युनिकेशंस प्रोजेक्ट आया। इसने गुजरात में आवश्यकता-आधारित और स्थानीय-विशिष्ट कार्यक्रम प्रसारण के लिए एक क्षेत्रीय प्रयोगशाला के रूप में काम किया। बाद में 1980 के दशक में आर्यभट्ट नाम का पहला भारतीय अंतरिक्ष यान सोवियत लॉन्चर का उपयोग करके विकसित और लॉन्च किया गया था। इसके बाद भास्कर- I और II मिशन, INSAT, PSLV, GSLV और बहुत कुछ किया गया।

ISRO का महत्व

इसरो का लक्ष्य भारत के लिए अंतरिक्ष तक पहुंच प्रदान करने के लिए लॉन्च वाहनों और संबंधित प्रौद्योगिकियों को डिजाइन और विकसित करना है।

यह पृथ्वी के अवलोकन, संचार, नेविगेशन, मौसम विज्ञान और अंतरिक्ष विज्ञान के लिए उपग्रहों और संबंधित प्रौद्योगिकियों का डिजाइन और विकास भी करता है।

भारतीय राष्ट्रीय उपग्रह (इनसैट) कार्यक्रम इसरो द्वारा दूरसंचार, टेलीविजन प्रसारण और विकासात्मक अनुप्रयोगों की आवश्यकता को पूरा करने के लिए विकसित किया गया था।

इसरो के भारतीय रिमोट सेंसिंग सैटेलाइट (आईआरएस) कार्यक्रम का उपयोग प्राकृतिक संसाधनों के प्रबंधन और अंतरिक्ष आधारित इमेजरी के माध्यम से पर्यावरण के अवलोकन के लिए किया जाता है। यह सामाजिक विकास के लिए अंतरिक्ष आधारित अनुप्रयोगों को विकसित करता है और अंतरिक्ष विज्ञान और ग्रहों की खोज में अनुसंधान और विकास करता है।

https://navbharattimes.indiatimes.com/education/gk-update/difference-between-drdo-and-isro-with-general-knowledge-all-you-need-to-know/articleshow/89648671.cms

Defence News

Defence Strategic: National/International

The Indian EXPRESS

Fri, 18 Feb 2022

Defexpo 2022 India-Africa ministers' meet from March 10

During the four-day event, being held for the first time in Gujarat, defence manufacturers will exhibit their wares at the Helipad Exhibition Centre at Gandhinagar.

By Avinash Nair

Ahmedabad: The second edition of the India-Africa Defence Ministers Conclave, will be one of the highlights of the 12th edition of biennial defence exhibition — Defexpo 2022, which will be held from March 10 to 13, at three different venues in Ahmedabad and Gandhinagar.

The first edition of the conclave involving African countries was held at Lucknow during the last DEFEXPO in 2020 where defence ministers and 154 delegates from 14 African countries participated. The second edition is expected to strengthen the defence cooperation between India and African nations.

During the four-day event, being held for the first time in Gujarat, defence manufacturers will exhibit their wares at the Helipad Exhibition Centre at Gandhinagar.

Collaborations and joint ventures in defence equipment, software, digital defence, provisioning of defemce equipment, spares and their maintainance will be also explored.

During the four-day event, being held for the first time in Gujarat, defence manufacturers will exhibit their wares at the Helipad Exhibition Centre at Gandhinagar.

On March 10, the inaugural function will be held at Mahatma Mandir. This will be followed by seminars at the same venue. Live demonstrations will be held by all the services, defence Public Sector Undertakings and industry to showcase land, naval, air and homeland security systems, at the Sabarmati riverfront in Ahmedabad.

Foreign defence manufacturers, including Rafael Advanced Defence Systems, Israel Aerospace Industries Ltd, Northop Grumman Corporation, Boeing, Lockheed Martin, Airbus, among others have taken up space at the helipad grounds for their respective exhibits.

A total of 842 exhibitors who have registered for the event. Over 1000 exhibitors from 70 countries are expected to participate during the event. Indian players in defence sector like Larsen

& Toubro Ltd, Ashok Leyland Ltd, Tata Advanced Systems Ltd, Mahindra Defence Systems Ltd, Adani Defence System and Technologies Ltd Kalyani Group, Armoured Vehicles Nigam Ltd, Avadi, Chennai, Advanced Weapoms and Equipment India Ltd, Cochin Shipyard, Mazagon Dock Shipbuilders Ltd, Garden Reach Shipbuilders and Engineers Ltd. are among those who will display their products at the exhibition that will have a "India pavilion" and a "Gujarat pavilion."

DRDO, Brahmos Aerospace, IAF and Navy will also have their own exhibits. While March 10 to 11will be business days, the exhibition will be thrown open to public on March 12 and 13.

The Def-Expo 2022 with the theme "India-The Emerging Defence Manufacturing Hub" will also feature a "Bandhan ceremony" where a number of MoUs are expected to be signed. The event will be held in a hybrid mode, where attendees can also join virtually and participate in seminars, B2B meetings and view products.

https://indianexpress.com/article/cities/ahmedabad/defexpo-2022-india-africa-ministers-meet-from-march-10-7779225/

ASPI AUSTRALIAN STRATEGIC POLICY INSTITUTE THE STRATEGIST

Fri, 18 Feb 2022

The BrahMos missile system and the Philippines' quest for deterrence

By Erick Nielson C. Javier

At the end of last year, the Philippines released initial funding for the purchase of the Indian–Russian BrahMos missile system. The contract for three batteries to be operated by the Philippine Marine Corps was signed by Secretary of National Defense Delfin Lorenzana in January, with delivery of the first systems expected in 2023.

The director of the Asia Maritime Transparency Initiative, Gregory Poling, called it the 'most strategic purchase the AFP [Armed Forces of the Philippines] has made in years'.

The Philippines has long desired to procure land-based missiles as part of its military modernisation program. While previous efforts failed due to 'changed priorities', the need for these weapons was catalysed by increasing Chinese aggressive actions in the West Philippine Sea; the most recent was the harassment of Philippine resupply efforts to Ayungin (Second Thomas) Shoal in November.

BrahMos is an impressive weapon, known as one of the world's fastest (supersonic, not hypersonic) cruise missiles. Its deployment could allow the Philippines to enact its own version of an anti-access/area denial strategy.

However, it would be premature to say that BrahMos by itself is a gamechanger. Due to restrictions under the Missile Technology Control Regime (to which India is a signatory), BrahMos missiles supplied to the Philippines will be limited to a range of 290 kilometres (156 nautical miles). While such range is a first for the Philippines, it isn't enough to cover the full 370 kilometres (200 nautical miles) of the Philippines' exclusive economic zone. Being stuck on land-based launchers in an archipelago also limits the system's strategic mobility.

Even at its export-limited range, BrahMos must be supported by an effective intelligence, surveillance, target-acquisition and reconnaissance (ISTAR) system to find and track targets, and a resilient command and control (C2) complex to ensure that command can use it. The AFP's C2ISTAR system is hobbled by a still-developing C2 complex and limited numbers of vulnerable crewed observation aircraft and drones. Even if it were fully operational, a C2ISTAR complex could be disrupted; in the event of war, an adversary would do its utmost to disrupt and destroy the

Philippines' C2ISTAR capabilities. Maintaining BrahMos's deterrent capability will require not only building this complex but ensuring that it can withstand any attempts to degrade it in battle.

Neither does possessing a robust C2ISTAR complex combined with BrahMos suffice for establishing reliable deterrence. Effectively deterring an adversary requires material capability to inflict 'unacceptable damage' and the political will to fight. The former leads to questions of risk calculus and damage tolerance; the latter requires willpower and understanding the consequences of the use of weapons.

Although such analyses are usually done in the context of nuclear deterrence, these concerns are also relevant for conventional deterrence. In the Philippines' case, conventional deterrence may well depend on the ability of the AFP to dissuade a possible fait accompli, specifically by the People's Liberation Army, over some or all the Philippine-held features in the Kalayaan Island Group (Spratly Islands).

While China has yet to directly comment on the Philippines' plans, Chinese Foreign Minister Wang Yi, in a forum on Philippines–China relations held shortly after the announcement, promised that China 'will not use its strength to bully smaller countries'. China also pushed through with a donation of assorted non-offensive materiel worth US$19.5 million to the AFP.

Perhaps China feels that it need not consider Philippine BrahMos in its equations. As the largest plans of the AFP modernisation program call for five batteries, saying that that's not enough is an understatement when considering the scale of the potential opposition.

Still, an AFP with BrahMos is better than an AFP without it, because it increases its chances of defending the country from external aggressors. This and other efforts to strengthen Philippine defence—including maintaining alliances and partnerships with like-minded countries—should, to paraphrase Poling, keep coercion at the grey-zone level instead of open warfare.

The Philippine defence establishment needs to do more beyond just purchase new weapons. The AFP needs to integrate BrahMos and other new capabilities into its operations, through wargaming and enhanced training.

The Philippines must continue to develop and enhance its ideas and strategy for achieving its deterrence objectives. Tools like the US net assessment method, if appropriately adapted and updated to suit the Philippines' particular needs, contexts and situation, may be useful. It is imperative as well to study Chinese strategic culture and assess the damage tolerance threshold of the Chinese Communist Party.

The road ahead for the Philippines is challenging given its own complicated and inward-looking strategic culture. But for the country to make the most of its new purchases and safeguard its sovereignty, the Philippines must evolve its deterrence and strategic thinking now, while there's still time.

(Erick Nielson C. Javier is a defence research officer at the National Defense College of the Philippines. He previously spent five years with the Armed Forces of the Philippines' Office of Strategic Studies and Strategy Management. The views expressed in this article are his alone and do not represent the views of the National Defense College of the Philippines, the Department of National Defense, the Armed Forces of the Philippines or the Philippine government. Image: Vasilyev Serge/Flickr.)

https://www.aspistrategist.org.au/the-brahmos-missile-system-and-the-philippines-quest-for-deterrence/

BUSINESS INSIDER
INDIA

Fri, 18 Feb 2022

Opinion: How India is trying to tackle China's military challenge

By Sameer Patil

Finance Minister Nirmala Sitharaman's budget on February 1 has made all the right noises regarding defence, with Rs. 5.25 lakh crore being allotted to the Ministry of Defence (MoD), a hike of 10%, and an emphasis on self-reliance in defence manufacturing. While challenges of resource availability persist, the MoD still continues to grab the largest share of the central government's expenditure.

But beyond the numbers about revenue (Rs.2.39 lakh crore) and capital allocation (Rs.1.52 lakh crore) to the MoD, this budget has also demonstrated the Indian government's long-term view of the China threat through two crucial steps: reinforcing greater budgetary support for the Indian Navy and the border infrastructure. This comes in the backdrop of the prolonged border-standoff with the People's Liberation Army (PLA) in the Himalayas, which has amplified India's threat perception. Accordingly, the government has made necessary emergency purchases—from winter clothing to fighter jets—to ensure that the Indian military is geared to face the PLA. The focus on naval capabilities and border infrastructure facilities complement this approach.

Prioritising Indian Navy

With approximately 355 ships and submarines, the PLA Navy has now emerged as the largest navy in the world. In response, India has stepped up its naval activities, including increased patrols in the Indian Ocean. In addition, India's growing Indo-Pacific ambitions have brought a greater naval presence and engagement with the region.

Representative image Pixabay

However, with a fleet of about 130 ships and submarines, one-third in size of the PLA Navy, the strain on the Indian Navy is immense. This is accentuated by delays in shipbuilding and induction, which have substantially affected the pace of naval modernisation. Hence, the Navy has now re-worked its aspiration for a 200-ship fleet to a more realistic goal of a 170-ship fleet.

Partially addressing this problem, the government in this budget has increased the capital allocation for naval modernisation from Rs.33.2 thousand crore (FY 2021-22 BE) to Rs.47.5 thousand crore (FY 2022-23 BE). This includes Rs.29.4 thousand crore for the naval fleet. The funds allocated are more than what the Navy had demanded (Rs. 37.6 thousand crore for FY 2021-22) and hopefully, in the subsequent years, the defence ministry will manage to fulfil the Navy's demand.

Besides boosting the Indian naval presence, this greater budgetary allocation will also contribute to the expansion of India's shipyards as most of the naval expenditure is incurred in shipbuilding. At present, India's public sector shipyards are manufacturing 48 ships and submarines, making the Indian Navy the most indigenised of the three services. Two significant naval inductions expected this year are the Cochin Shipyard Ltd.-built indigenous aircraft carrier, IAC-1 (or INS Vikrant), and INS Vagir from Mazagon Dock Limited, likely to enter service in the second half of 2022.

Strengthening northern borders

Another key dimension of the China challenge has been the border infrastructure. China has determinedly pursued infrastructure build-out to give the PLA a sustained presence on the Line of Actual Control (LAC) in the last two decades. India has been late to this game but is slowly

catching up, as seen by its current border infrastructure push with border roads, strategic railway lines, and Advance Landing Grounds (airfields in areas closer to the LAC).

The Border Roads Organisation (BRO), the primary agency to construct border roads along the LAC, has received a substantial hike annually in the last few budgets. Keeping up with that trend, this year, the BRO has been allocated Rs. 3500 crore, 40% more than the FY 2021-22 BE of Rs. 2500 crore. This sustained enhanced allocation has ensured that the BRO has completed many long-pending projects, including the Atal Tunnel in Rohtang and Umling La pass in Ladakh.

In addition, Sitharaman also announced the "Vibrant Villages Programme" that will focus on developing remote villages on the LAC. To be administered by the Ministry of Home Affairs, development activities under this programme will include constructing infrastructure, housing, tourist centres, road connectivity projects, provisioning for renewable energy, expanding access to satellite television, and support for livelihood generation. This programme is vital due to the glaring difference in living standards in the villages on the Indian and Chinese sides of the LAC. China's white paper on Tibet has noted that between 2017 and 2020, the Chinese government implemented a host of schemes to ensure better access to housing, electricity, roads, and the internet.

These initiatives on naval modernisation and border development will yield the desired outcome only if India sustains them with the required budgetary support. While the government has to bear the cost of naval modernisation, it can engage the private sector to defray the border development costs by potentially through the corporate social responsibility framework.

(Sameer Patil is Senior Fellow at the Observer Research Foundation. The views expressed are his own.)

https://www.businessinsider.in/defense/news/opinion-how-india-is-trying-to-tackle-chinas-military-challenge/articleshow/89633390.cms

The Tribune

Fri, 18 Feb 2022

China to set up missile repair base in Bangladesh

Bangladesh is China's 2nd largest arms customer

By Ajay Banerjee

New Delhi: A decade after China supplied Bangladesh with surface-to-air missile systems, a maintenance and overhaul facility will come up there which can double up as a production assembly line of the same missile and its advanced variants.

May double up as assembling facility

- Chinese firm 'Vanguard' has been selected as the partner for maintenance facility to be set up in Bangladesh for FM-90 missile systems
- Bangladesh is China's 2nd largest arms customer
- Procured 17% of all Chinese military exports, according to the Stockholm International Peace Research Institute
- Pakistan procured about 38% of Chinese arms exports
- Beijing is fifth largest exporter of arms and weapons, accounting for some 5.2% of global sales

Chinese company "Vanguard" has been selected as partner of this maintenance hub to be set up in Bangladesh for the FM-90 air defence missile, sources say.

At present, Bangladesh's Air Force, Navy and the Army are respectively equipped with it. The People's Liberation Army has the same missile in its arsenal.

The truck mounted FM-90 system is an improved version of the "Hong Qi", a missile first produced by the China National Precision Machinery Import and Export (CNPMIEC) in 1998. It was supplied to Bangladesh in 2011. Bangladesh is surrounded on three sides by India, while the

fourth side is the Bay of Bengal. The missile is an anti-aircraft system capable of all-weather operations against flying objects like planes, missiles or drones.

It can operate against multiple targets. It has a 25-km range radar and is capable of launching simultaneous offensive against multiple targets, which includes ability to hit ultra-low-altitude cruise missiles, air-to-surface missiles and anti-radiation missiles at a distance of more than 16 km.

The missile is among the clutch of Chinese military-related investments and supplies to Bangladesh that includes warships, naval guns anti-ship missiles and surface-to-air missile systems.

China's second largest arms customer is Bangladesh. The latest report of the Stockholm International Peace Research Institute (SIPRI), a Sweden-based think tank, on arms sellers during 2016-2020 says Bangladesh procured some 17 per cent of all Chinese military exports.

Pakistan procured 38 per cent of Chinese exports. Beijing is the fifth largest exporter of arms and weapons accounting for some 5.2 per cent of all global sales.

https://www.tribuneindia.com/news/nation/china-to-set-up-missile-repair-base-in-bdesh-370800

The EurAsian Times

Fri, 18 Feb 2022

Strangling like a Python, China says its powerful 'Robotic Snake' can crush enemy satellites like never before

Some of China's claims about its space and defense technologies sound very unreal but may not really be impossible to implement. China's newest claim pertains to a space robot that could have underlying disruptive capabilities.

By Sakshi Tiwari

A Chinese research team has built a giant robotic snake with unrivaled strength, flexibility, and lifespan to explore space.

The 1.5-meter (5-foot) long robot, which would be attached to a spacecraft, is said to be made up of nine segments, each of which can generate 190 Newton-meters of torque, about double that of a 1,200cc Harley-Davidson Iron motorbike.

Artist's impression of the robotic snake (Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences)

The researchers claim the joints between segments can twist and spin a lot, allowing the robot to snake through a complex environment to reach a tight area of a space station or satellite that is inaccessible to astronauts or robotic arms.

Last month, a Chinese-designed robotic arm demonstrated its capability of grasping and moving a cargo spacecraft in a 47-minute maneuver last month, sparking fears in the US that it could be used to destroy space assets of China's rivals.

The new snake robot goes one step ahead as the researchers claim it has the ability to reach inaccessible areas by eliminating the barriers of a complex space environment.

The snake robot which is a 9 segment amalgamation also has an unlimited lifespan in the way that a broken or dysfunctional piece of the robot can be removed and replaced with a new one, allowing it to operate indefinitely. However, as of now, this precedent only exists in theory.

"Making repairs in a complex space environment costs a great deal of human and material resources. The modular hyper-redundant manipulator is an effective solution to this problem,"

according to an article published in the local peer-reviewed journal Robot last month by a team lead by Professor Xu Zhenbang of Changchun Institute of Optics, Fine Mechanics, and Physics.

According to Xu and his colleagues, the robots might also act together as tentacles to move or handle a large object.

A Beijing-based space expert went so far as to say that the robot is powerful enough to crush a small satellite in the same way as "a python strangles its prey."

This new robot lends credence to the concerns about China installing technology in space that would allow it to carry out space warfare against adversaries in case of a conflict on earth.

Interestingly, it comes shortly after its satellite Shijian-21 stunned the world by grabbing and moving a dead BeiDou asset from its orbital path.

'Chinese Snake' In Space

Snake-like robots are already employed to monitor undersea cables and do other jobs, but there are no reports of their employment in space due to engineering challenges.

Each segment of such a machine, for example, is theoretically an autonomous robot, complete with motors, transmission, processor, and high-precision sensors. It was difficult, according to the researchers, to compress the components into a small space and protect them with many layers of protection, stated SCMP.

Another difficulty was creating a joint that was both strong and flexible. Xu's team came up with a novel design that could increase an electric motor's torque by more than 3,000 times.

According to the researchers, each section is required to communicate with other segments, share power, and coordinate every movement in order to fulfill a task, which necessitated the use of cutting-edge artificial intelligence.

The snake robot had been put through its paces on the ground, including exploring new territory, said Xu's team. To avoid colliding with objects while moving forward, the robot had to locate gaps, enter a tight space, and quickly change its body segments.

The robot was also able to securely create letters on a blackboard with chalk or nudge a celebration balloon, according to the researchers.

Xu stated that the robot would be improved more before it was launched into orbit. Some metallic alloy components, for example, would be updated to carbon fiber to save weight.

The machine has used some electric motors from Switzerland, microprocessors from Texas Instruments in the US, and gearboxes from Japan. The researchers did not disclose whether these parts will be changed, but Chinese space officials typically demand that crucial components be manufactured in China to eliminate security and sanction concerns.

This is also indicative of the fact that the said technology is in a very preliminary phase and it could be years before it is finally launched into space.

One scientist believes that exposing the machine in a publicly available publication indicated that China had no plans to deploy it as a weapon. He went on to say that the same technology utilized in military applications could have vastly different designs and specifications.

However, these assurances would not suffice for the adversaries of China that have grown wary of its space ambitions and technologies, often presented as a harmless space asset but with underlying offensive capabilities.

China gearing up for Space Warfare?

Apprehension has been raised that China could employ these space technologies to deactivate satellites from rival countries. The US military has raised alarm about China's anti-satellite capabilities, particularly with regard to Shijian 17, an experimental probe with a robotic arm that performed strange maneuvers after its flight in 2016.

The January Tiangong Space Station robotic arm maneuver further exacerbated this concern even though the International Space Station (ISS) has had its own robotic arms for decades. The US fears that China could use these robotic arms to destroy its satellites and other space assets.

US Space Command Commander James Dickinson had earlier said the technique "could be used in a future system for grappling other satellites" at a Congressional hearing.

However, Beijing has maintained that its space robotic technology was created for peaceful purposes, such as creating large-scale infrastructure, serving spacecraft or satellites in orbit, and eliminating space debris.

In fact, smaller versions of Tiangong's robotic arm have been deployed on China's "scavenger satellites", which gather and direct space junk to burn up in the atmosphere. Over the previous decade, China has launched a number of scavenger satellites, as previously stated by EurAsian Times.

The fears, however, aren't new and have lingered for a while. In 2020, a Pentagon report had highlighted that China continued the development and acquisition of offensive space technologies designed to restrict/destroy the enemy's space-based assets.

As the great power competition between China and the West transcends to outer space, China could be expected to develop and launch more such assets with an objective to challenge what is seen as the Western hegemony.

https://eurasiantimes.com/china-says-its-powerful-robotic-snake-can-crush-enemy-satellites/

Firstpost.

Fri, 18 Feb 2022

Explained: History of President's Fleet Review, its significance and what to expect from the 12th edition

President Ram Nath Kovind will attend the event, which will see more than 60 ships and submarines, 50 aircraft participating, on 21 February in Visakhapatnam

President Ram Nath Kovind will attend the President's Fleet Review of the Indian Navy on 21 February in Visakhapatnam.

File image of Navy's battleship INS Ganga during an operational demonstration as a pre-cursor to the President's Fleet Review in 2011. AFP

For the review, more than 60 vessels of the Navy and Coast Guard, all of which have been made in the country, will participate.

The Navy said that this will be the 12th Presidential Fleet Review — the last one was conducted in 2016 under President Pranab Mukherjee.

As we gear up for this event, here's all you need to know about this event, its genesis, its significance and what can be expected on Monday.

What is the President's Fleet Review?

According to the Navy, the fleet review is a "long-standing tradition followed by navies all across the world" and it is "an assembly of ships at a pre-designated place for the purpose of displaying loyalty and allegiance to the sovereign and the state".

A fleet review is usually conducted once during the tenure of the President.

Defence sources have been quoted as saying that the fleet review is second only to the Republic Day Parade.

The earliest recorded Indian Fleet Review was in the 18th Century by the powerful Maratha fleet, consisting of 'Ghurabs' and 'Gallivats', under the renowned Sarkhel (Grand Admiral) Kanhoji Angre at the coastal fortress of Ratnagiri.

Till date, 11 Presidential Fleet Reviews have been conducted since Independence, of which two have been International Fleet Reviews, in 2001 and 2016.

Additionally, this is the second time Visakhapatnam is hosting the President Fleet Review. President Dr APJ Abdul Kalam had reviewed the fleet in 2006 in Visakhapatnam.

According to the Navy, with the reviewing of ships, the head of the State reaffirms the faith in the fleet and its ability to defend the nation's maritime interest, and such an exercise is done without any 'belligerent intentions'.

The exercise was be held in 2020 last, but was cancelled due to the pandemic. It was scheduled to be held at Andaman and Nicobar.

What to expect at this President's fleet review?

Commemorating 75 years of independence, the theme of PFR 22 is 'Indian Navy – 75 years in Service of the Nation'.

It has been reported that more than 60 ships and submarines and 50 aircraft will participate in the review. Vessels of the Coast Guard, the Shipping Corporation of India, and the National Institute of Ocean Technology, submarines will also participate in the review.

The events scheduled for 21 February include the 'review anchorage', the 'steampast' and 'flypast' by mobile columns, the 'parade of sails', and the release of a first day cover of a commemorative stamp.

All the participating units, which include Indian Naval warships, submarines, auxiliary vessels as also assets of other maritime organisations, will be anchored in a formation of four precise columns, and the President will review all participating ships by 'steaming past' them, embarked on a naval vessel designated the 'Presidential Yacht'.

"Each ship would render a salute to the Supreme Commander as the Yacht sails past. Indian Naval aircraft would simultaneously fly overhead the formation rendering their salute," the navy said.

Apart from the steam-past, there will be a flypast by about 50 aircraft. All aircraft in operation under the aviation wing of the Indian Navy will participate in the flypast, which includes the latest acquisition such as Mikoyan MiG-29K, Boeing P-8I Neptune and the HAL Dhruv MKIII.

After the flypast, the Marine Commandos (Marcos) will give a demonstration on anti-terrorist operation, a search-and-rescue drill, and a steam-past by a few submarines.

After the exercise, the President will address the nation, which will mark the end of the review.

Later, the President will release a special cover and a postal stamp at the Naval Base to mark the occasion

https://www.firstpost.com/india/explained-history-of-presidents-fleet-review-its-significance-and-what-to-expect-from-the-12th-edition-10382231.html

oneindia®

Fri, 18 Feb 2022

Explained: The significance of India's first maritime security coordinator

New Delhi, Feb 17: In a significant move, the government has appointed Vice Admiral (retd) G Ashok Kumar as India's first national maritime security coordinator with a mandate to ensure cohesion among various key stakeholders with an overall objective to strengthen the country's maritime security.

Late last year, the Cabinet Committee on Security had cleared the proposal for the creation of the post, PTI reported.

The appointment of G Ashok Kumar, who is a former Navy vice chief, is seen as part of India's consistent efforts to bolster its maritime security following the 26/11 Mumbai terror attack 14 years back when a group of sea-borne terrorists struck at the heart of the country's financial capital.

The government has appointed the country's first national maritime security coordinator (NMSC), people familiar with the developments said.

The NMSC works in coordination with the National Security Council Secretariat headed by NSA Ajit Doval.

They said the NMSC is tasked to coordinate among the Indian Navy, the Coast Guard, security agencies involved in coastal and maritime security and 13 coastal states and Union Territories.

Vice Admiral Kumar retired from service in July last year.

The government has been focusing on ensuring cooperation among all maritime stakeholders to enhance India's maritime security and surveillance in view of multiple security challenges.

Since the Mumbai terror attack, the government has taken a string of security measures including putting in place layered maritime surveillance to bolster coastal and maritime security.

India has a coastline of around 7,500-kilometres.

On November 26, 2008, 10 Pakistani terrorists sneaked into Mumbai through the sea, arriving by boat from Karachi, and went on the rampage, carrying out coordinated attacks on the main Chattrapati Shivaji railway terminus, the iconic Taj Mahal hotel, the Trident hotel, and a Jewish centre - all in the heart of the financial capital's downtown area.

Over 166 people, including foreigners, were killed in the nearly 60-hour assault that sent shock waves across the country and even brought India and Pakistan to the brink of war.

https://www.oneindia.com/india/explained-the-significance-of-india-s-first-maritime-security-coordinator-3372500.html

Press Information Bureau
Government of India

Ministry of Defence

Thu, 17 Feb 2022 5:45PM

Joint Security Exercise at Port Blair Airfield

Andaman & Nicobar Command (ANC) conducted a joint security exercise at Port Blair airfield on February 16, 2022. The aim of the drill was to test the preparedness of all security agencies during various contingencies like terrorist attack, hostage crisis and hijack situation at the airfield or elsewhere.

Day and night drills were conducted at INS Utkrosh and Veer Savarkar International Airport. Quick Reaction Teams (QRTs) from the Army, Navy and CISF were deployed to counter portrayed terrorist threats at various places inside the airfield. Simultaneously, Special Forces elements from the NSG, Ghatak Platoons and Marine Commandos (MARCOS) were also mobilised for synchronised operation along with the Quick Reaction Teams.

The Andaman & Nicobar Command has recently promulgated a Joint Standard Operating Procedures for Security at Port Blair Airfield. These drills were designed to test, validate and fine tune the SOPs as well as improve coordination between all military and security agencies at Port Blair. The SOPs have been developed to effectively counter any threat on this critical airfield were also re-validated during the joint exercise.

https://pib.gov.in/PressReleasePage.aspx?PRID=1799065

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Thu, 17 Feb 2022 5:45PM

पोर्ट ब्लेयर एयरफील्ड में संयुक्त सुरक्षा अभ्यास

अंडमान और निकोबार कमान (एएनसी) ने 16 फरवरी, 2022 को पोर्ट ब्लेयर एयरफील्ड में एक संयुक्त सुरक्षा अभ्यास किया। इस अभ्यास का उद्देश्य एयरफील्ड में या कहीं और आतंकवादी हमले, बंधक संकट तथा विमान अपहरण की स्थिति जैसी विभिन्न आकस्मिक घटनाओं के दौरान सभी सुरक्षा एजेंसियों की तैयारियों का परीक्षण करना था।

आईएनएस उत्कर्ष और वीर सावरकर अंतरराष्ट्रीय हवाई अड्डे पर दिन और रात के अभ्यास किए गए। इस एयरफील्ड के भीतर विभिन्न स्थानों पर चित्रित किए गए आतंकवादी खतरों से निपटने के लिए सेना, नौसेना और सीआईएसएफ की त्वरित प्रतिक्रिया टीमों (क्यूआरटी) को तैनात किया गया था। साथ ही, एनएसजी, घातक प्लाटून और मरीन कमांडो (मारकोस) के विशेष बलों को भी त्वरित प्रतिक्रिया टीमों के साथ इस समन्वित ऑपरेशन के लिए जुटाया गया था।

अंडमान और निकोबार कमांड ने हाल ही में पोर्ट ब्लेयर एयरफील्ड में सुरक्षा के लिए एक संयुक्त मानक संचालन प्रक्रिया की घोषणा की है। इन अभ्यासों को एसओपी के परीक्षण, सत्यापन और सुदृढ़ीकरण के साथ-साथ पोर्ट ब्लेयर में सभी सैन्य तथा सुरक्षा एजेंसियों के बीच समन्वय को बेहतर करने की दृष्टि से डिज़ाइन किया गया था। इस महत्वपूर्ण एयरफील्ड पर किसी भी खतरे का प्रभावी ढंग से मुकाबला करने के लिए इन एसओपी को विकसित किया गया था, जिन्हें इस संयुक्त अभ्यास के दौरान फिर से सत्यापित किया गया।

https://pib.gov.in/PressReleasePage.aspx?PRID=1799104

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Fri, 18 Feb 2022

Chaining atoms together yields quantum storage

Engineers at Caltech have developed an approach for quantum storage that could help pave the way for the development of large-scale optical quantum networks. The new system relies on nuclear spins—the angular momentum of an atom's nucleus—oscillating collectively as a spin wave. This collective oscillation effectively chains up several atoms to store information.

The work, which is described in a paper published on Feb. 16 in the journal *Nature*, utilizes a quantum bit (or qubit) made from an ion of ytterbium (Yb), a rare earth element also used in lasers. The team, led by Andrei Faraon, professor of applied physics and electrical engineering, embedded the ion in a transparent crystal of yttrium orthovanadate (YVO_4) and manipulated its quantum states via a combination of optical and microwave fields. The team then used the Yb qubit to control the nuclear spin states of multiple surrounding vanadium atoms in the crystal.

"Based on our previous work, single ytterbium ions were known to be excellent candidates for optical quantum networks, but we needed to link them with additional atoms. We demonstrate that in this work," says Faraon, the co-corresponding author of the *Nature* paper.

The device was fabricated at the Kavli Nanoscience Institute at Caltech, and then tested at very low temperatures in Faraon's lab. A new technique to utilize entangled nuclear spins as a quantum memory was inspired by methods used in nuclear magnetic resonance (NMR).

"To store quantum information in nuclear spins, we developed new techniques similar to those employed in NMR machines used in hospitals," says Joonhee Choi, a postdoctoral fellow at Caltech and co-corresponding author of the paper. "The main challenge was to adapt existing techniques to work in the absence of a magnetic field."

A unique feature of this system is the pre-determined placement of vanadium atoms around the ytterbium qubit as prescribed by the crystal lattice. Every qubit the team measured had an identical memory register, meaning it would store the same information.

"The ability to build a technology reproducibly and reliably is key to its success," says graduate student Andrei Ruskuc, first author of the paper. "In the scientific context, this let us gain unprecedented insight into microscopic interactions between ytterbium qubits and the vanadium atoms in their environment." This research is part of a broader effort by Faraon's lab to lay the foundation for future quantum networks. Quantum networks would connect quantum computers through a system that operates at a quantum, rather than classical, level. In theory, quantum computers would one day be able to perform certain functions faster than classical computers by taking advantage of the special properties of quantum mechanics, including superposition, which allows quantum bits to store information as a 1 and a 0 simultaneously. As they can with classical computers, engineers would like to be able to connect multiple quantum computers to share data and work together—creating a "quantum internet." This would open the door to several applications, including the ability to solve computations that are too large to be handled by a single quantum computer, as well as the establishment of unbreakably secure communications using quantum cryptography.

The paper's co-authors include graduate students Chun-Ju Wu and Jake Rochman.

More information: Andrei Ruskuc et al, Nuclear spin-wave quantum register for a solid-state qubit, *Nature* (2022). DOI: 10.1038/s41586-021-04293-6

Journal information: *Nature*

https://phys.org/news/2022-02-chaining-atoms-yields-quantum-storage.html