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# समाचार पत्रों से चयित अंश
# Newspapers Clippings

डीआरडीओ समुदाय को डीआरडीओ प्रौद्योगिकियों, रक्षा प्रौद्योगिकियों, रक्षा नीतियों, अंतर्राष्ट्रीय संबंधों और विज्ञान एवं प्रौद्योगिकी की नूतन जानकारी से अवगत कराने हेतु दैनिक सेवा

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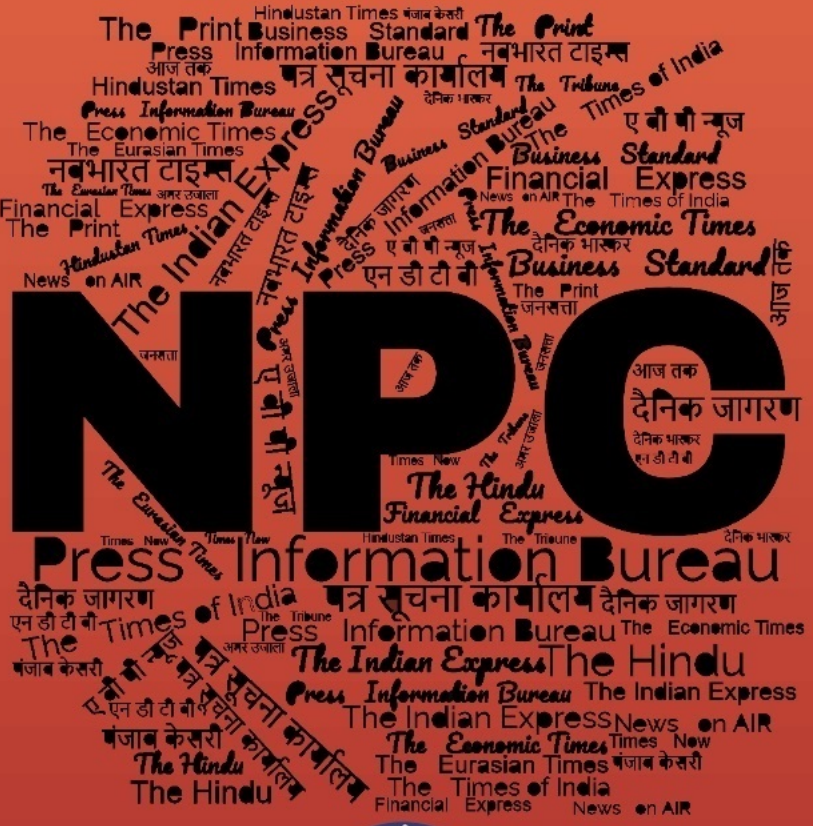


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THE TIMES OF INDIA

***Thu, 16 May 2024***

# DRDO Chief pushes for Innovation

Combat Vehicles Research and Development Establishment (CVRDE) should focus more on , said Samir V Kamat secretary of department of defence research and development and chairman of the defence research and development organisation (DRDO).

Speaking at the golden jubilee celebrations of CVRDE at Avadi on Thursday, Kamat appreciated CVRDE's efforts for achieving self-reliance in armoured fighting vehicle categories and said the institution should "focus more on innovations to adapt to the emerging scenario in the defence ecosphere." CVRDE flagship products were displayed in an exhibition

A panel discussion on 'Tank warfare in the 21st century: the operational and technological requirements' was also held.

During CVRDE's Golden Jubilee celebrations in Avadi, Secretary of DRDO, Samir V Kamat, urged for more innovation at CVRDE to adapt to emerging defence challenges. He lauded CVRDE's self-reliance achievements in armoured fighting vehicles, especially the Battle Tank Arjun. CVRDE's contributions include the development of Light Tank, LCA Tejas, and unmanned aerial vehicles.

Dr SC Agarwal, Sneh, Deepanshu, and Ankit celebrated their 50th anniversary at a plush resort with red and white flower dcor, a three-tiered cake, and lively dancing. The party included socializing with Dr Parul Singh, Dr Priti Gupta, Amit Gupta, Dr Ranjana, Dr Anand Prasad, Supreet Bhalla Gupreet Bhalla and Harmeek Singh making it a memorable occasion for all.

Muttamsetti Srinivasa Rao and Ganta Srinivasa Rao vie for Bheemili Assembly seat with promises of tourism development, infrastructure upgrades, and settlement of land issues in Visakhapatnam district.

https://timesofindia.indiatimes.com/city/chennai/drdo-chief-pushes-for-innovation/articleshow/110189552.cms

TIMESNOWNEWS.COM

*Thu, 16 May 2024*

# Laser, AI, Quantum Computers: How DRDO Is Developing 'Science-Fiction' Like Weapons

Weapons that once belonged to science-fiction novels are now being readied. The Defence Research and Development Organisation (DRDO) is working on laser weapons: they work, but they're just getting better. The defence establishment now has use for Artificial Intelligence (AI) and quantum computers.

A 30 kilowatt system is ready; it can be used against helicopters and drones. It's usable at ground level, it can be used against drones from a distance of five km. If the effective range can be increased to 20-30 km, then it can a formidable weapon, a senior government official said. Currently, the official added, the initial cost is very high, but the operating costs are minimal, just power supply. The electricity turns into a laser beam, which can burn through carb fibre and metal. But the weight of the system ensures it is ground-based; it requires two vehicles. "It's a heating issue. We have to manage the cooling as the heat has to be dissipated," the official said. Work on the project is still underway. The U.S. has already deployed such weapons.

A Young Scientists' laboratory in Pune is working on quantum computing. Using fibre optics, quantum can be used for surveillance and detection and also, break codes. Similarly, there's a Young Scientists' laboratory in Bangalore that is working on AI. The areas include facial recognition techniques and "language modes," the official said. It will be able to identify languages and quickly translate them, helping military intelligence capabilities.

https://www.timesnownews.com/india/laser-ai-quantum-computers-how-drdo-is-developing-science-fiction-like-weapons-article-110177612

# Defence News

## Defence Strategic: National/International

Press Information Bureau
Government of India

**Ministry of Defence**

***Fri, 17 May 2024***

# 12th India-Mongolia Joint Working Group meeting to bolster Bilateral Defence Ties held in Ulaanbaatar

The 12th Joint Working Group (JWG) meeting between the Defence Ministries of India and Mongolia took place in Ulaanbaatar on May 16-17, 2024. The meeting was co-chaired by Joint Secretary, MoD, India Shri Amitabh Prasad and State Secretary of MoD, Mongolia Brigadier General Gankhuyag Davagdorj. India's Ambassador to Mongolia Shri Atul Malhari Gotsurve also attended the meeting.

During the JWG, both sides expressed satisfaction at the ongoing defence cooperation between the two countries. They reviewed the progress on various bilateral defence cooperation initiatives and identified means to further enhance cooperation in these areas, articulating steps in this direction. Both sides also exchanged views on the current geopolitical situation.

The Joint Secretary highlighted the potential of the capacity & capability of the Indian defence industry, and looked forward to a fruitful partnership with the Armed Forces of Mongolia. The Mongolian side exuded confidence in the capacity & capability of the Indian industry. Both sides also acknowledged the growing ties between the two countries.

The Joint Secretary & the Indian Ambassador also called on Deputy Defence Minister of Mongolia Mr B Bayarmagnai, and discussed bilateral cooperation issues. The delegation visited a training establishment in Ulaanbaatar and reviewed the ongoing engagements.

India enjoys age-old historical, cultural and civilisational ties with Mongolia. Both countries regard each other as 'Spiritual Neighbours'. In the modern times, values like democracy, freedom and market economy hold the two nations closer.

https://pib.gov.in/PressReleasePage.aspx?PRID=2020848

THE ECONOMIC TIMES

*Thu, 16 May 2024*

# Indian Air Force's first LCA Mark 1A Fighter Aircraft set for July delivery, HAL accelerates Indigenous Aircraft Program

Hindustan Aeronautics Limited (HAL) is on track to deliver the first LCA Mark 1A fighter aircraft to the Indian Air Force (IAF) by July, following a brief delay due to technical reasons. The aircraft, initially slated for delivery in February-March, is now expected to be handed over to the IAF in July, as per defence officials speaking to ANI. "The Indian Air Force and the public sector HAL have recently reviewed the LCA fighter project and it is now expected to be delivered to the force by July this year," defence officials told ANI.

HAL successfully conducted the first flight of the indigenous fighter last month. Additional integration trials are underway and are expected to be completed in the coming weeks before the aircraft is delivered to the IAF, the officials added The induction of the LCA Mark 1A into the IAF's fleet marks a significant milestone in achieving self-reliance in the military sector. It is anticipated that Prime Minister Narendra Modi may be invited to commemorate this event. The LCA Mark 1A project, initiated during Prime Minister Modi's tenure, has already seen an order worth Rs 48,000 crore for 83 planes.

Another order for 97 planes, expected to be worth Rs 65,000 crore, is likely to be placed by the end of this financial year. "The Defence Ministry has already issued a tender to Hindustan Aeronautics Limited (HAL), for the purchase of 97 made-in-India LCA Mark 1A fighter jets," ANI reported. This tender represents the largest order for indigenous military hardware ever placed by the Indian government. HAL has been given a three-month timeframe to respond to the tender.

Government officials informed ANI that this program aims to replace the Indian Air Force's fleet of MiG-21s, MiG-23s, and MiG-27s, which have either been phased out or are scheduled for phase-out soon. "The indigenous fighter aircraft programme, fully backed by Defence Ministry and Air Headquarters, is set to be a big boost for promoting indigenisation as well as give major business to the small and medium enterprises engaged in defence business across the country," ANI quoted officials as saying.

Prime Minister Narendra Modi has been a strong advocate for the revival of HAL, which has secured orders for building all types of indigenous fighter aircraft and helicopters, along with the engines for them, under his government. "The Prime Minister also undertook a sortie in the trainer variant of the indigenous fighter which was the first ever sortie by the Prime Minister of India in any combat aircraft," ANI reported. Indian Air Force Chief VR Chaudhari, speaking to ANI on foreign soil in Spain, first announced the plan to acquire 97 more LCA Mark 1A fighter jets, highlighting the ambitious plans to boost indigenous fighter aircraft orders.

https://economictimes.indiatimes.com/news/defence/indian-air-forces-first-lca-mark-1a-fighter-aircraft-set-for-july-delivery-hal-accelerates-indigenous-aircraft-program/articleshow/110183977.cms

जनसत्ता

*Thu, 16 May 2024*

# देश की पहली मिडगेट सबमरीन Arowana बनकर तैयार, खुफिया मिशन को दे सकती है अंजाम

मिडगेट पनडुब्बी बनकर तैयार हो चुकी है। इसका निर्माण मझगांव डॉक शिपयार्ड लिमिटेड द्वारा किया गया है। इसको एरोवाना नाम दिया गया है। एमडीएल ने केवल इसे बनाया ही नहीं है बल्कि पूरी डिजाइनिंग भी की है। सबमरिन को प्रूफ ऑफ कान्सेप्ट के तौर पर बनाया गया है। ताकि दुनिया को इस बात का पता लग सके कि भारत किसी से भी कम नहीं हैं और ऐसी सबमरीन को खुद भी बना सकता है। इस सबमरीन का फायदा केवल जांच-पड़ताल में ही नहीं किया जाएगा बल्कि समुद्र के अंदर सीक्रेट ऑपरेशन के लिए भी किया जाएगा। इसके जरिए कम कमांडो के साथ किसी भी तरह का सैन्य अभियान या सीक्रेट मिशन आसानी से किया जा सकता है।

## क्या है एरोवाना की खासियत

अब हम बात करेंगे कि एरोवाना गहरे और छिछले पानी दोनों में गोता लगा सकती है। यह नेटवर्किंग के जरिये नेवी के साथ मिलकर आसानी से दुश्मन को चकमा दे सकती है। इतना ही नहीं, हीं इससे बड़े मिशन को भी अंजाम दिया जा सकता है। जानकारी के अनुसार इसकी लंबाई 12 मीटर है और इसकी स्पीड 2 नॉट है। इसमें फिलहाल अभी स्पीड की ही कमी है। बैटरी लिथियम और आयरन से बनी हुई है।

## मिडगेट सबमरीन क्या होती है?

मिडगेट सबमरीन को आमतौर पर छोटी पनडुब्बी कह सकते हैं। इसका वजन 150 टन के अंदर ही है। इस सबमरीन में लोगों की बैठने की क्षमता भी कामी कम है। इसमें एक बार में ज्यादा से ज्यादा 9 ही लोग बैठ सकते हैं। अगर मिलिट्री मिशन को अंजाम देने के लिए कहा जाए तो छह या उससे ज्यादा लोक बैठकर अंजाम दे सकते हैं। इसके अंदर ज्यादा लंबे समय तक नहीं बैठा जा सकता है। यह एक छोटी पनडुब्बी है। इसमें सिर्फ इतना इंतजाम होता है कि कमांडो बैठकर जाए और मिशन को अंजाम देकर वापस आ जाए।

## सबमरीन में कैसे हथियार होते हैं?

मिडगेट सबमरीन में हथियारों के लिए खास इंतजाम होते हैं। इनमें टॉरपीडो जैसे कई हथियार होते हैं। इसके अलावा कई बार इसमें गोताखोरों के लिए स्वीमर डिलिवरी व्हिकल भी होते हैं। मिडगेट सबमरीन का इस्तेमाल केवल सैन्य अभियान के लिए ही नहीं होता है। बल्कि इसको व्यापारिक तौर पर भी इस्तेमाल किया जाता है। इसके जरिये साइंटिफिक रि सर्च भी की जा रही है। अब तो इनका इस्तेमाल समुद्र के अंदर पर्यटन के लिए भी किया जा रहा है।

https://www.jansatta.com/national/country-first-midget-submarine-arowana-ready-can-carry-out-intelligence-missions/3366038/

The EurAsian Times

*Fri, 17 May 2024*

# Pakistan Eyes more J-10C Fighters; Continues to "Lead" Indian Air Force in Combat Jet Acquisition since 1954

For a long time, military-controlled Pakistan has looked ahead and taken preemptive decisions. Starting in 1954, the Pakistan Air Force (PAF) acquired 102 much superior U.S.-built F-86F 'Sabre.' Around the same time, India got the Dassault Ouragans (Toofani). The Indian Air Force (IAF) acquired the Dassault Mystère IV a few years later.

In 1961, Pakistan, as a major non-NATO ally, received F-104 Starfighters from the USA under the Mutual Assistance Program. The IAF responded by purchasing the Soviet MiG-21, which entered service in 1964. In 1981, the USA cleared F-16 sales to Pakistan as part of an aid package. India signed for Mirage 2000 in 1982. In 1984, India ordered and became the first international customer of the MiG-29 outside of the Warsaw Pact.

The PAF has been operating the Saab 2000 using the Erieye radar as its primary AEW&C platform since 2009 and the Chinese ZDK-03 AEW&C since 2011. The PAF operates three modified Dassault Falcon 20 aircraft, which have a primary role in electronic warfare. India inducted the Beriev A-50 Phalcon AEW&C in 2009, and the DRDO 'Netra' AEW&C was inducted in 2017.

PAF inducted the first JF-17 squadron in February 2010, vis-à-vis IAF inducting LCA Mk1 in January 2015. PAF already has close to 150 of these home-grown fighters. India has built around 50 LCA.

The first batch of JF-17C Block 3 aircraft was inducted in PAF in March 2023. India's LCA Mk1A will be inducted soon. India signed up for the Rafale in 2015, and Pakistan responded with the purchase of J-10CE, signing the deal in 2021.

**J-10 Vigorous Dragon**

The Chengdu J-10 is a medium-weight, single-engine, multi-role, all-weather combat aircraft with a delta wing and canard design and fly-by-wire flight controls. It is primarily designed for air-to-air combat but can also perform strike missions.

The aircraft is considered to be of the fourth-plus generation. It made its first flight in 1998 and was inducted into service in 2005. Over 600 aircraft have been built and are flying with the PLAAF, the PLA Navy, and the PAF.

J-10C is the upgraded version. It is powered by a WS-10B thrust-vectoring control engine and equipped with an indigenous AESA fire-control radar, imaging infrared seeker (IIR) PL-10, and long-range PL-15 air-to-air missiles (AAM). J-10CE is the export version of J-10C. The export variant's radar has a lesser range, and there are weapon sales restrictions. PL-15 is reportedly still not cleared for Pakistan.

Pakistan has selected the Grifo-E AESA-MMR from Italian company Leonardo's SELEX-ES subsidiary for its J-10CEs. The same radar will be on Chengdu JF-17 Block-3 aircraft.

Pakistani aircraft are being modified for the Link-16 air-to-air/air-to-ground voice/data communications network. Also, the software-defined radio (SDR) is from Leonardo. These modifications are being done at the PAC Kamra Complex.

Pakistan had earlier ordered 36 J-10CE, and may order 14 more to make the total 50. Saudi Arabia and Egypt have reportedly expressed interest in purchasing J-10CE jets.

**Rafale Compared To J-10CE**

A comparison between the J-10CE and Rafale fighter jets is somewhat unfair, primarily because the latter is a twin-engine fighter with a globally recognized Meteor missile system and the latest electronic warfare suite.

The J-10 and the Rafale can both be termed 4.5-generation multi-role fighter jets that, on some counts, have similar performance and capabilities. However, the Rafale has a clear edge over the J-10 in terms of technology, weapons, aero-engines, and combat experience.

The Rafale also has one of the best electronic warfare suites. It can have a supercruise with four missiles and a 1250-liter belly drop tank. The technical parameters of the two are tabulated in the table below.

| | **Rafale** | **J-10 CE** |
|---|---|---|
| Country | France | China |
| Length (meters) | 15.27 | 16.03 |
| Wing Span (metres) | 10.90 | 9.75 |
| Empty weight (kg) | 9,850 | 8,850 |
| Max Take-Off Weight (kg) | 24,500 | 19,277 |
| Hard Points and Payload | 14 (9,500 kg) | 11 (5,600 kg) |
| Range (km) | 3,700 | 1,850 |
| Engine and Thrust | 2xSnecma M88-4e (150 kN) | Shenyang WS-10 (140kN) |
| Radar | RBE2 AESA | Chinese AESA, |
| AAM (Range) | Meteor (200 km) | PL-15 (200 km)<br>PL-12 (70-100 km) |

The Rafale has 20 percent greater thrust for just 11 percent higher weight than the J-10C and, therefore, a better thrust/weight ratio. The Snecma M88 is a tried-and-tested aero engine, while the WS-10 reportedly matured enough only after 2009 and is still evolving.

The Rafale has been used in combat operations in Mali, Afghanistan, Libya, Iraq, and Syria. The J-10 has, at best, only done joint exercises with Pakistan.

**Pakistan Needs Replacements**

Pakistan continues to fly F-7PG (MiG-21 variant), Dassault Mirage III aircraft of ROSE I project vintage, Mirage 5 ROSE II, Mirage IIIEA, and Mirage 5PA.

These seven squadron equivalents are due for phasing out. Effectively, they will be required to replace nearly 250 aircraft in the next decade. The current plan of PAF is to reduce the force to three types. F-16, J-10CE, and JF-17.

They will add a fifth-generation fighter aircraft of Turkish (Kaan) or Chinese (J-31) origin by around 2030. There have been reports that PAF has been interested in KJ-500 AEW&C and Y-8 electronic warfare aircraft.

**Acquiring Hongdu L-15 Falcon**

The Hongdu L-15 Falcon (JL-10) is a twin-engine, supersonic, advanced jet trainer and light combat aircraft already in service in the PLA Air Force (PLAAF). It uses fly-by-wire (FBW) and has a glass cockpit.

Pakistan is negotiating to acquire this lead-in fighter-trainer (LIFT). The aircraft was built based on the design data of Yak 130, and China was assisted by Russia's Yakovlev Experimental Design Bureau.

The aircraft has a Passive Electronically Scanned Array (PESA) radar, a Radar Warning Receiver (RWR), and an IFF. It can also carry jamming pods and four tons of weapons loaded on nine external hard points.

The LIFT variant can carry a range of weaponry, including the PL-8 air-to-air missile (AAM) and LS-6 satellite-guided bombs. Since China does not have an appropriate aero-engine, therefore Ukrainian Ivchenko Progress AI-222K turbofan powers the L-15.

Pakistan is interested in acquiring the light attack version. So far, Zambia and UAE have purchased the aircraft. The aircraft is considered cheap, and the cost is between $10-15 million.

**Pakistan All Eggs In Chinese Basket**

China has emerged as a major defense supplier to debt-ridden Pakistan. The linkage is most powerful in military aviation.

Starting 1965, China supplied PAF with China-made Russian variants of MiG-19 and MiG-21 and the Harbin H-5 (Ilyushin IL-28). China helped establish 'Heavy Industries' at Taxila in 1971 for equipment rebuilding and, in 1973, the Pakistan Aeronautical Complex at Kamra North of Islamabad.

In 2007, as part of a joint project, China rolled out a 'designed for Pakistan' Fighter, the JF-17 'Thunder.' The costs were kept low by borrowing technologies developed for the Chinese J-10

fighter. The aircraft can carry a variety of Chinese AAMs, including the formidable PL-15. Currently, PAF has 150 of these, and the strength is likely to increase to over 200 one day.

Pakistan has acquired the Chinese HQ-9/P AD system, a Chinese variant of the S-300 that covers high-to-medium-level threats. 60 Chinese-designed, Pakistan-made K-8 Karakorum intermediate jet trainers are in service. Pakistan operates Chinese CH-4 recce-cum-strike drones, which can carry up to four PGMs.

Despite China's pledge to the contrary, it has continued to provide Pakistan with specialty steels, guidance systems, and technical expertise in the latter's effort to develop long-range ballistic missiles. The M-11 is a copy of the DF-11, and the Hatf, Shaheen, and Anza series of missiles have been built with Chinese assistance.

**JF-17: Crown Jewel Of Cooperation Facing Hurdles**

There have been reports of the JF-17 aircraft being grounded several times due to issues like cracks in guide vanes, exhaust nozzles, and flame stabilizers. Myanmar, which was the first country besides Pakistan to buy JF-17, was forced to ground its fleet owing to technical malfunctions.

Ever since they have been miffed with Islamabad over 'unfit' JF-17 aircraft. Nigeria has acquired only three JF-17s and is in wait-and-watch mode.

Unavailability of spare parts, delays or disruptions in the supply chain, and related maintenance issues have led to the grounding of the aircraft. The aircraft uses a Russian RD-93 engine, which needs regular maintenance and overhaul.

The Ukraine conflict has slowed the supply chain of spares. The original equipment supplier, Rosoboronexport, is under strict economic sanctions by the U.S. JF-17 avionics are supported by the KLJ-7 radar, but its performance has been consistently below stipulated levels. The radar is being changed to a Block III variant.

Both China and Pakistan have been desperately looking for buyers of JF-17s in Asia and Africa. The reasonable price makes it attractive. Malaysia and Sri Lanka's publicly announced rejection of the JF-17 appears to have been a setback for the modernization program of PAF. Pakistan has often sounded the names of many countries, but they were found to be rumors and false beginnings.

**Implications For India**

Pakistan and the IMF have just started negotiations for a fresh bailout package to address the cash-strapped country's fiscal challenges and implement crucial reforms. Pakistan needs a rollover of around $12 billion in debt from key allies in 2024-25 to meet the whopping $23 billion gap in its external financing.

Pakistani insiders are hoping to get a rollover of $5 billion from Saudi Arabia, $3 billion from the UAE, and $4 billion from China. Meanwhile, they are seeking fresh financing from China.

Pakistan continues to be in political turmoil. Masses are revolting because of economic hardships, and there are secessionist forces in Pakistan-occupied Kashmir, Gilgit Baltistan, and Baluchistan.

While the world wants to know how Pakistan is going to fund such large defense purchases, with the military calling the shots, the defense budgets keep increasing, and purchase wish lists are expanding.

60 percent of equipment with Pakistan armed forces is of Chinese origin. There is, thus, a level of interoperability. PLAAF and PAF are exercising regularly. Thus, it presents a combined threat against India.

IAF continues to be at an all-time low of 31 fighter squadrons. While the Indian government has ordered increased LCA production to stem the gap, at least a one-time purchase of 114 new fighters would have to be resorted to.

India needs more MMRCA-class aircraft. If the Rafale is chosen for both the IAF and the Indian Navy, it could be built in India. LCA Mk-2 is still some distance away. India must also hasten the development of the AMCA lest we be forced to acquire fifth-generation aircraft from abroad.

India must also accelerate the development of BrahMos 2 and Astra 3 missiles. The time to act is now; otherwise, it may be too late.

https://www.eurasiantimes.com/pakistan-eyes-more-j-10c-fighters-continues/


***Thu, 16 May 2024***

# China gears up Third Carrier for more Enduring Operations despite Flight Deck Flaw

China has completed the maiden sea trials for its third aircraft carrier, which will be in service as CNS *Fujian* once it is commissioned. The vessel sailed off from the Jiangnan Shipyard in Shanghai on 1 May and the trials were completed eight days later.

The trials focused on testing the “reliability and stability of the aircraft carrier's propulsion and electrical systems”, read a report from state-owned Xinhua News Agency, which was published to announce the trials. *Fujian* was launched by Jiangnan Shipyard in June 2022. While it is slated to be the People's Liberation Army Navy's (PLAN's) third aircraft carrier overall, it is the country's first vessel to be configured for catapult-assisted take-off but arrested recovery (CATOBAR) aircraft operations.

Satellite images that have been analysed by *Janes* since 2021 support postulations that *Fujian* is equipped with electromagnetic catapults, given the presence of distinctive features along the track of the aircraft launching system.

These features include trunking grooves that can support a power bus along the track, which bear resemblance to the US Navy's Electromagnetic Aircraft Launch System incorporated on the service's first Ford-class aircraft carrier. *Fujian* has an overall length of about 320 m and its flight deck has a width of about 80 m at the widest point. It has been equipped with a total of three electromagnetic catapults and one arresting cables-equipped oblique runway as its recovery area.

https://www.janes.com/defence-news/news-detail/special-report-china-gears-up-third-carrier-for-more-enduring-operations-despite-flight-deck-flaw

THE NEW INDIAN EXPRESS

*Wed, 15 May 2024*

# Sri Lanka in talks with India to set up Small Arms Manufacturing Unit: Minister Tennakoon

Sri Lanka on Wednesday said it is holding talks with India to set up a small arms manufacturing unit under the wider ambit of defence cooperation between the two countries.

"We are in discussions with India to set up a small arms manufacturing unit. We are in touch with our Indian counterparts, there is so much we can take and learn from India," State Minister of Defence Premitha Bandara Tennakoon said responding to a query from the media.

"Discussions are ongoing (for) a joint venture in the military industry," Tennakoon said.

His statement comes a little more than a month after India's High Commissioner to Sri Lanka Santosh Jha told a defence seminar here that New Delhi was willing to offer modern defence equipment to friendly partner countries such as Sri Lanka.

"Like in other areas, India and Sri Lanka are cooperating closely on security and defence matters. The Indian defence industry today rolls out state-of-the-art systems, advanced technologies and world class equipment," Jha had said on April 10.

He added that various advanced platforms and equipment developed indigenously in India can also become viable, affordable and modern solutions for the Sri Lankan military.

Referring to the April 10 meeting, where he himself was present, Tennakoon on Wednesday said, Sri Lanka is not trying to buy “anything” at the moment, and added that such presentations are annual events.

"Connectivity is really good ... and military-to-military connectivity ... Indian and Sri Lankan military-to-military connectivity is at a high. So we maintain that …. that doesn't mean that we are going to buy anything from anyone,” the minister was quoted as saying by news portal NewsFirst.lk.

Speaking at the Presidential Media Centre under the theme of ‘Collective Path to a Stable Country,’ Tennakoon said, “The Indian defence manufacturing arm has boomed during the last two decades, and it's a model that Sri Lanka will have to look into.”

“We can take a lot from the Indian model. There's nothing wrong in learning from them. And I think we also should get into manufacturing,” he said.

The minister said that the Sri Lankan military has expertise in weapons manufacturing, which, however, is not at a scale expected to be and confirmed, “(So) Sri Lanka is in discussion with India to set up a small arms ammunition manufacturing unit.”

During the April 10 event, apart from Tennakoon, Sri Lanka’s Chief of Defence Staff Gen Shavendra Silva and the Commanders of the Air Force and Navy apart from senior officials from the Sri Lankan Armed Forces were also present.

Led by a senior India's Ministry of Defence official, a large and very diverse delegation from the Indian defence industry, along with the representatives from the Sri Lankan businesses too had attended that conference.

India had asserted that its approach to Sri Lanka is guided by its neighbourhood-first policy and the vision SAGAR or Security and Growth for All in the Region is a flagship government initiative to help Indian Ocean Region neighbours.

https://www.newindianexpress.com/world/2024/May/15/sri-lanka-in-talks-with-india-to-set-up-small-arms-manufacturing-unit-minister-tennakoon-2

TheDefensePost

***Thu, 16 May 2024***

# China shows off Robot 'Dogs of War' in Cambodia Drills

China's military showed off its machine gun-equipped robot battle "dogs" Thursday at the start of its biggest-ever drills with Cambodian forces, as the United States frets about Beijing's growing influence in the Southeast Asian country.

Cambodia has long been a staunch ally of China, receiving billions of dollars in investments, and Washington is growing increasingly concerned Beijing will use a Cambodian naval base it is upgrading on the Gulf of Thailand to expand its influence in the region.

More than 2,000 troops, including 760 Chinese military personnel, are taking part in the drills at a remote training center in central Kampong Chhnang province and at sea off Preah Sihanouk province.

The 15-day exercise, dubbed Golden Dragon, also involves 14 warships — three from China — two helicopters, and 69 armored vehicles and tanks, and includes live-fire, anti-terrorism, and humanitarian rescue drills.

The hardware on show included the so-called "robodogs" — remote-controlled four-legged robots with automatic rifles mounted on their backs.

Handlers kept the dogs of war on the leash, demonstrating only their walking capabilities to watching journalists and top brass — not their shooting skills.

Opening the exercises, Cambodian armed forces commander-in-chief Vong Pisen said they would "enhance the capabilities" of the two armies in the fight against terrorism.

US Worries

Vong Pisen insisted Cambodia would never allow a foreign military base on its territory, echoing previous assertions by Cambodian leaders.

After Cambodia dismantled facilities at Ream naval base near the Cambodian port city of Sihanoukville, built partly with American funding and having played host to US military exercises, China began funding its renovation.

Two Chinese warships docked at Ream in December for the first time after work began to expand the base.

Washington says Ream could give Beijing a key strategic position in the Gulf of Thailand near the disputed South China Sea, which China largely claims.

Last year, Cambodian officials denied a new 363-meter (1,190-foot) pier at Ream was intended to berth aircraft carriers.

Earlier this week, Cambodian army spokesman Thong Solimo told reporters that the 2024 exercises were the biggest of their kind and that China would cover the cost.

The first Golden Dragon drills were held in 2016, and in early 2017 Cambodia scrapped a similar joint exercise — "Angkor Sentinel" — which had been held for the preceding seven years with US forces.

Cambodia's defense ministry last week confirmed the two Chinese warships anchored at Ream were "to help train Cambodian naval personnel and to prepare for the Golden Dragon exercises."

A spokesman said the Chinese vessels were testing the "Ream Naval Base that China is constructing for Cambodia," and denied Chinese troops would be stationed at the base.

A third Chinese warship docked in Sihanoukville on Monday with troops and materials for the exercises, according to the Cambodian army.

The drills follow a three-day visit by China's top diplomat Wang Yi to Cambodia in April to deepen ties between the two countries.

https://www.thedefensepost.com/2024/05/16/china-robot-dogs-of-war/

## Science & Technology News

THE HINDU

***Thu, 16 May 2024***

# The use of AI in Drug Development | Explained

Drug development is an expensive and time-consuming process. However, the advent of Artificial Intelligence (AI) has opened up a world of possibilities with respect to fast-tracking drug development.

**How does the process start?**

The process of developing a drug starts with identifying and validating a target. A target is a biological molecule (usually a gene or a protein) to which a drug directly binds in order to work. The overwhelming majority of targets are proteins. Only those proteins with ideal sites where drugs

can go and dock to do their business are druggable proteins. Target proteins are identified in the discovery phase, wherein a target protein sequence is fed into a computer which looks for the best-fitting drug out of millions in the library of small molecules for which the structures are stored in the computer. The process assumes that the structures of the target protein and drug are known. If not, the computer uses models to understand the sites where a drug can bind.

This discovery process avoids time-consuming laboratory experiments that require expensive chemicals and reagents and have a high failure rate. Once the suitable protein target and its drug are identified, the research moves to the pre-clinical phase, where the potential drug candidates are tested outside a biological system, using cells and animals for the drug's safety and toxicity. After this, as part of the clinical phase, the drug is tested on a small number of human patients before being used on more patients for efficacy and safety.

Finally, the drug undergoes regulatory approval and marketing and post-market survey phases. Due to a high failure rate, the discovery phase limits the number of drugs that pass and carry on to the pre-clinical and clinical phases.

**How can AI help this process?**

AI has the potential to revolutionise target discovery and understand drug-target interaction by drastically cutting down time, increasing the accuracy of prediction of interaction between a drug and its target, and saving money.

The development of two AI-based prediction tools, AlphaFold and RoseTTAFold, developed by researchers at DeepMind, a Google company, and the University of Washington, U.S., respectively, has provided a major scientific breakthrough in the last four years in the area of computational drug development. Both tools are based on deep neural networks.

The tools' neural networks use massive amounts of input data to produce the desired output — the three-dimensional structures of proteins. Published recently, the new avatars of AlphaFold and RoseTTAFold, called AlphaFold 3 (developed jointly by Isomorphic Labs, a DeepMind spinoff) and RoseTTAFold All-Atom, respectively, take the capability of these tools to an entirely new level.

The significant difference between the upgraded versions and their previous forms is their capability to predict not just static structures of proteins and protein-protein interactions but also their ability to predict structures and interactions for any combination of protein, DNA, and RNA, including modifications, small molecules and ions.

Additionally, the new versions use generative diffusion-based architectures (one kind of AI model) to predict structural complexes. In a test with 400 interactions between targets and their small molecule drugs, AlphaFold 3 accurately predicted their interactions 76% of the time versus 40% by RoseTTAFold All-Atom.

**What are the drawbacks?**

With all the promise and potential in drug development, AI tools have limitations. For example, the tools can, at best, provide up to 80% accuracy in predicting interactions (the accuracy comes down drastically for protein-RNA interaction predictions).

Second, the tools can only aid a single phase of drug development, target discovery and drugtarget interaction. It will still have to go through the pre-clinical and clinical development phases, and there is no guarantee that the AI-derived molecules will result in success in those phases. Third, one of the challenges with diffusion-based architecture is model hallucinations, where insufficient training data causes the tool to produce incorrect or non-existent predictions.

Finally, unlike the previous versions of AlphaFold, DeepMind has not released the code for AlphaFold 3, restricting its independent verification, broad utilisation and use for protein-small molecule interaction studies.

**What about India?**

Developing new AI tools for drug development requires large-scale computing infrastructure, especially ones with fast Graphics Processing Units (GPUs) to run multiple tasks with longer sequences. GPU chips are expensive, and with newer and faster ones being produced by hardware makers every year, they have a quick expiration date. India needs such large-scale computing infrastructure.

That, along with a lack of skilled AI scientists, unlike in the U.S. and China, is the second reason why researchers in India could not establish a first-mover advantage in developing AI tools for drug development despite the country having a rich history in protein X-ray crystallography, modelling and other fields of structural biology.

However, with a growing number of pharmaceutical organisations, India can lead the way in applying AI tools in target discovery, identification, and drug testing.

https://www.thehindu.com/sci-tech/technology/the-use-of-ai-in-drug-development-explained/article68183913.ece

THE TIMES OF INDIA

***Thu, 16 May 2024***

# Einstein proved right! Study gives First Proof of 'Plunging Regions' around Black Holes

A new study by an international team led by researchers at Oxford University Physics has provided the first observational proof of a key prediction from's theory of regarding the existence of "plunging regions" around black holes.

"Einstein has been proved correct!" researchers say. Published in the Monthly Notices of the Royal Astronomical Society on Thursday (May 16), the study — "Continuum emission from within the plunging region of black hole discs" — used X-ray data from NASA's NuSTAR and NICER space telescopes to analyse smaller black holes relatively close to Earth.

The study gives the first observational proof that a "plunging-region" around black holes not only exists, but exerts some of the strongest gravitational forces yet identified in the galaxy, researchers

said. The new findings are part of wide-ranging investigations into outstanding mysteries around black holes by astrophysicists at Oxford University Physics.

Later this year, a second Oxford team hopes to move closer to filming first movies of larger, more distant black holes as part of a multi-million European initiative, a statement shared with TOI read.

Unlike in Newton's theory of gravity, Einstein's theory states that sufficiently close to a black hole it is impossible for particles to safely follow circular orbits, instead they rapidly "plunge" toward the black hole at close to the speed of light – giving the plunging region its name.

"This is the first look at how plasma, peeled from the outer edge of a star, undergoes its final fall into the centre of a black hole, a process happening in a system around 10,000 light years away. What's really exciting is that there are many black holes in the galaxy, and we now have a powerful new technique for using them to study the strongest known gravitational fields," said Dr Andrew Mummery, of Oxford University Physics, who led the study.

Mummery said that while Einstein's theory predicted that this final plunge would exist, this was the first time researchers have been able to demonstrate it happening. "...Think of it like a river turning into a waterfall – hitherto, we have been looking at the river. This is our first sight of the waterfall."

"We believe this represents an exciting new development in the study of black holes, allowing us to investigate this final area around them. Only then can we fully understand the gravitational force," Mummery added.

"This final plunge of plasma happens at the very edge of a black hole and shows matter responding to gravity in its strongest possible form."

https://timesofindia.indiatimes.com/home/science/einstein-proved-right-study-gives-first-proof-of-plunging-regions-around-black-holes/articleshow/110185013.cms

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