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DRDO News

DRDO Technology News



Thu, 01 Sep 2022

LCA Mk2 फाइटर जेट को मिली सरकार की हरी झंडी... जानिए इस स्वदेशी फाइटर जेट की ताकत

सुरक्षा मामलों की कैबिनेट कमेटी (CCS) ने 1 सितंबर 2022 को एलसीए मार्क 2 फाइटर जेट (LCA Mk2 Fighter Jet) के विकास को हरी झंडी दे दी है. एयरोनॉटिकल डेवलपमेंट एजेंसी के प्रमुख गिरीश देवरधरे ने बताया कि LCA Mark 2 के डेवलपमेंट प्रोजेक्ट को अनुमति मिल गई है. यह एक अत्याधुनिक 17.5 टन का सिंगल इंजन वाला सुपरसोनिक एयरक्राफ्ट है. वायुसेना में इसके आने से पुराने मिराज 2000 (Mirage 2000), जगुआर (Jaguar) और मिग-29 (MiG-29) कॉम्बैट एयरक्राफ्ट को हटाने में मदद मिलेगी.

गिरीश ने बताया कि इस फाइटर जेट की पहली उड़ान साल 2024 में संभव है. हालांकि इसे पूरी तरह से विकसित होकर तैयार होने में पांच साल और लगेंगे. साल 2027 से उसका पूरा उत्पादन शुरू हो जाएगा. इस प्रोजेक्ट को हरी झंडी मिलने का मतलब है कि LCA Mk1A प्रोग्राम को भी बढ़ावा मिलेगा. साथ ही पांचवीं पीढ़ी के अत्याधुनिक मीडियम कॉम्बैट एयरक्राफ्ट प्रोजेक्ट को डेवलप करने में मदद मिलेगी.

गिरीश ने बताया एलसीए मार्क 2 फाइटर जेट (LCA Mk2 Fighter Jet) के प्रोटोटाइप का विकास एक साल में हो जाएगा. उसकी उड़ान भी साल या दो साल में संभव है. 2027 तक डेवलपमेंट प्रोजेक्ट पूरा हो जाएगा. इसी दौरान हम इसके ट्रा यल्स और अन्य विकासात्मक कार्य पूरा कर लेंगे.

DRDO को लगता है कि अगर एवियोनिक्स और अन्य क्षमताओं की बात करें तो इसे राफेल क्लास एयरक्राफ्ट (Rafale Class Aircraft) की श्रेणी में रखा जा सकता है. जबकि इसका वजन

कम है. भारत सरकार ने यह भी कहा है कि इस विमान का इंजन भी भारत में ही बनना चाहिए लेकिन प्राथमिक प्रोजेक्ट के पूरा होने के बाद.

DRDO फिलहाल एलसीए मार्क 2 फाइटर जेट (LCA Mk2 Fighter Jet) के GE-414 इंजन का विकास करेगा. यह GE-404s का एडवांस वर्जन होगा. यह इंजन फिलहाल 83 LCA Mark 1A में लगे हुए हैं. अगले दो सालों के अंदर ही मार्क 1ए को भारतीय वायुसेना में शामिल कर लिया जाएगा. फिलहाल भारतीय वायुसेना के पास 30 LCA तेजस विमान मौजूद हैं. दो विमानों का उपयोग HAL कर रहा है ताकि वह एलसीए-1ए का डेवलपमेंट कर सके.



आइए अब जानते हैं कि एलसीए मार्क 2 फाइटर जेट (LCA Mk2 Fighter Jet) की खासियत क्या-क्या होगी. LCA Mark 2 फाइटर जेट में एक या दो क्रू बैठ सकेंगे. लंबाई 47.11 फीट होगी. विंगस्पैन 27.11 फीट और ऊंचाई 15.11 फीट होगी. अधिकतम टेकऑफ वजन 17,500 किलोग्राम होगा. यह अपने साथ 6500 किलोग्राम वजन के हथियार उठाकर उड़ सकेगा.

LCA Mark 2 फाइटर जेट की सबसे बड़ी ताकत होगी उसकी गति. यह अधिकतम 2385 किलोमीटर प्रतिघंटा की रफ्तार से उड़ेगा. यानी दुनिया के सर्वश्रेष्ठ फाइटर जेट्स की गति को टक्कर देगा. इसके उड़ान की कुल रेंज 2500 किलोमीटर है जबकि कॉम्बैट रेंज 1500 किलोमीटर होगी. यह अधिकतम 56,758 फीट की ऊंचाई तक उड़ान भर सकेगा. इसमें 13 हार्ड प्वाइंट्स होंगे गैर गोयानी 13 अलगअलग प्रकार के हथियार या फिर उनका मिश्रण लगाया जा सकता है.

LCA Mark 2 फाइटर जेट में हवा से हवा में मार करने वाली MICA, ASRAAM, Meteor, Astra, NG-CCM, हवा से सतह पर मार करने वाली ब्रह्मोस-NG ALCM, LRLACM, स्टॉर्म शैडो, क्रिस्टल मेज लगाने की योजना है. इसके अलावा एंटी-रेडिएशन मिसाइल रुद्रम 1/2/3 लगाया जाएगा. इसके अलावा इसमें प्रेसिशन गाइडेड म्यूनिसन यानी बम भी लगाए जाएंगे.

इन प्रेसिशन गाइडेड म्यूनिसन में शामिल हैं स्पाइस, HSLD-100/250/450/500, DRDO Glide Bombs, DRDO SAAW. लेजर गाइडेड बमों में सुदर्शन बम लगाया जाएगा. इसके अलावा क्लस्टर म्यूनिसन, लॉयट्रिंग म्यूनिसन कैट्स अल्फा और अनगाइडेड बम लगाए जा सकते हैं.

LCA Mark 2 फाइटर जेट में जो एवियोनिक्स लगे हैं वो उसे दुश्मन का पता लगाने. हमलों से बचने में मदद करेंगे. इसमें LRDE Uttam AESA Radar, DARE Unified Electronic Warfare Suite (UEWS), DARE Dual Colour Missile Approach Warning System (DCMAWS) और DARE Targeting pod लगे होंगे.

<https://www.aajtak.in/india/news/photo/modi-government-clears-lca-mk2-tejas-fighter-jet-project-know-everything-about-it-tstrd-1529391-2022-09-01-1>



Fri, 02 Sep 2022

DRDO's Conventional Ballistic Missile Design Ready, Awaits Signal for Development

By Shishir Gupta

With Chinese land-based conventional ballistic missile arsenal rapidly expanding, the Defence Research and Development Organization (DRDO) has finalized the design for a 1,500-kilometer range conventionally armed ballistic missile with an anti-ship variant.

While the DRDO is awaiting a green signal from the Narendra Modi government to move to the development stage, the still unnamed conventionally armed missile will deter any ship-based threat in the Indian Ocean, Bay of Bengal, and Arabian Sea. It will also counter any land-based threat from across the Line of Actual Control (LAC) in Xinjiang, Tibet, and Yunnan provinces.

While India has an arsenal of nuclear cruise and ballistic missiles up to 5000 km range from land and up to 3500 km range from sea-based deterrent, it does not have any conventional ballistic missile to tackle the adversary on land and on high seas. The missile will not only deter any carrier-based strike group from threatening India from the Indian Ocean but also provide land-based protection to its own aircraft carriers in the Bay of Bengal and the Arabian Sea through coastal deployment.

The PLA has a growing arsenal of conventional land-based missiles and launchers with a 4,000 km range Dong Feng 26, which is the first and only land-based missile capable of targeting an

American air force base in the US territory of Guam in the Indo-Pacific. Called Guam killer by Chinese propaganda media, the DF-26 missile provides a deterrent to PLA against carrier-based strike forces and airborne invasion from a significant distance away from the east coast of China. The other Chinese conventional missile is DF 21 D with a range of 1550 km and with a maneuverable re-entry vehicle for greater accuracy. Dubbed as the world's first anti-ship ballistic missile, the DF-21 D is referred to by Chinese propaganda media as a carrier killer to threaten US Navy aircraft carriers conducting freedom of navigation operations in the South China Sea.

With Chinese carrier-based strike forces expected to enter the Indian Ocean area by 2025 to match President Xi Jinping's ambition to become global superpower, India needs a conventional intermediate-range ballistic missile to target any sea-based threat to the country's over 7,000-kilometer coastline apart from island territories. The missile will add punch to India's submarine based conventional ballistic missile like BA-02 with a range of over 700 km.

<https://www.hindustantimes.com/india-news/drdo-conventional-ballistic-missile-design-ready-awaits-signal-for-development-101662087565883.html>

Defence News

Defence Strategic : National/International



Thu, 01 Sep 2022

DAC Issues RFI to Procure 616 General Purpose Machine Guns with Ammunition for Indian Army

Defence Acquisition Council (DAC) has accorded Acceptance of Necessity (AoN) for procurement of 616 General Purpose Machine Gun (GPMG) as per details given below with day and night sights and 87,78,000 rounds of Ammunition. The procurement will be in the Buy Indian category.

A machine gun is a fully-automatic mounted or portable firearm, usually designed to fire rifle cartridges in quick succession from an ammunition belt or large-capacity magazine, typically at a rate of several hundred rounds per minute. Earlier machine guns were manually operated, for example, by turning a hand crank.

Here are two main definitions of the upper limit of calibre for machine guns:

calibre larger than 12.7 millimetre (mm) (.50 calibre)

calibre larger than 20 mm

Larger-calibre automatic weapons are generally referred to as autocannons. In between, there are weapons that have been called by either name depending on other traits; for instance, there have been weapons of roughly 15 mm that were variably referred to as autocannons and machine guns.

All machine guns require the following components:

A feed system to load the chamber. Cartridges can be fed into the chamber by a variety of methods, the most common being magazines or ammunition belts.

A trigger mechanism to fire the round. This includes the actual trigger, a trigger sear to catch the bolt, a bolt and a firing pin, as well as other components. Typically, the act of pulling the trigger causes something to strike the primer on the round in the chamber and disengages the sears. This allows continual cycling of the bolt until the trigger is released. A sear then grabs the bolt or firing pins. This stops the machine gun at some point in its cycle.

An extractor system to eject the spent or misfired cartridge. Usually this is fairly simple. A pin on the side of the bolt catches a ridge on the cartridge and flicks it out an ejection port.

<http://www.indiandefensenews.in/2022/09/dac-issues-rfi-to-procure-616-general.html>



Fri, 02 Sep 2022

Tejas MK-2 to Fill Capability Void: IAF Chief

With the Government giving the go-ahead for developing the next generation of the Tejas light combat aircraft (LCA) MK-2, the new plane will fill the critical capability void, IAF chief VR Chaudhari said here on Thursday.

His remarks came a day after the Cabinet Committee on Security (CCS) on Wednesday approved the LCA-MK 2 project and sanctioned Rs 10,000 crores for its development. It is likely to take its first flight after two to three years and its serial production likely commence from 2028.

Underlining the importance of this project, the IAF chief also said the timely production of the indigenous fighter jet will address the issue of depleting strength of the fighter plane squadron strength. At present, the IAF has 30 squadrons (one squadron has 18-20 jets) while the sanctioned strength is 42.

Stressing the point that the new planes will fill the critical capability void, Chaudhari called upon all the stakeholders to work in close co-ordination for timely induction of the aircraft into the force. He also said this decision will give a filip to the indigenous design and development of the next generation fighter aircraft and add muscle to the 'Atmanirbhar Bharat' initiative in aerospace manufacturing field.

The Mk-2 fighter jet will be the most advanced LCA variant to be designed and developed indigenously by the Aeronautical Development Agency (ADA), sources said.

It will be equipped with a more powerful engine (GE-414), a superior radar, better avionics and electronics, and will be capable of carrying a higher weapons payload, they said. The new fighter

jet is expected to cater to the future requirements of IAF, which has already inducted earlier variants of the LCA and has ordered 83 Mk-1A variants.

The latest decision comes in the backdrop of the government in 2021 ordering the production of 83 Tejas LCA MK-I worth over Rs 48,000 crores. The Hindustan Aeronautics Limited (HAL) is manufacturing these planes and the first batch is likely to be inducted into the IAF by 2024. Once the MK-I and MK-2 are fully operational, the IAF will have more than 210 Tejas jets in its inventory thereby enhancing its operational capabilities.

Incidentally, India is all set to bag the first export order for Tejas LCA from Malaysia. Once the formal contract comes through, Malaysia will procure 18 Tejas from India. The HAL has recently opened an office in Kuala Lumpur for co-ordination with the Malaysian authorities in this regard. Several other countries including the US, Argentina, Australia, Egypt, Indonesia and the Philippines are also keen to buy aircraft.

<https://www.dailypioneer.com/2022/india/tejas-mk-2-to-fill-capability-void--iaf-chief.html>



Press Information Bureau
Government of India

Ministry of Defence

Wed, 01Sep 2022 2:10PM

Indian Army Contingent Participates in Exercise Vostok-2022 at Sergeyevsky, East Military District Russia

A multilateral strategic and command Exercise Vostok - 2022 has commenced today at the training grounds of the Eastern Military District of Russia from 01 to 07 September 2022. The exercise is aimed at interaction and coordination amongst other participating military contingents and observers.

The Indian Army contingent comprising of troops from 7/8 Gorkha Rifles had arrived at the exercise location and over the next seven days will undertake joint manoeuvres to include joint field training exercises, combat discussions, and firepower exercises.

The Indian Army contingent will look forward to sharing practical aspects and put into practice the validated drills, procedures and practice amalgamation of new technology through discussions and tactical exercises.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1856018>

VOSTOK-2022 Commences in Russia with India, China Participating

An Indian Army contingent comprising troops from 7/8 Gorkha Rifles is participating in the multilateral strategic and command exercise ‘Vostok-2022’ which commenced on Friday at the training grounds of the eastern military district in Russia. The exercise also includes participation by the Chinese People’s Liberation Army.

“The exercise is aimed at interaction and coordination amongst other participating military contingents and observers,” the Army said in a statement. The exercise is scheduled to be held from September 01 to 07. The war games also come as the war in Ukraine enters the seventh month.

The Indian Army contingent over the next seven days will undertake joint manoeuvres to include joint field training exercises, combat discussions, and firepower exercises, the statement said.

The Indian Army contingent will look forward to sharing practical aspects and putting into practice the validated drills, procedures and practice amalgamation of new technology through discussions and tactical exercises, it added.



The opening ceremony of Vostok-2022 being conducted in Russia on Thursday, September 01. | Photo Credit: PTI

Russia has stated that Vostok-2022 will be conducted in two phases. Participating contingents include observers from the Collective Security Treaty Organisation, the Shanghai Cooperation Organisation (SCO) and other partner states including Algeria, Armenia, Azerbaijan, Belarus, India, Kazakhstan, Kyrgyzstan, China, Laos, Mongolia, Nicaragua, Syria and Tajikistan, said Russian Deputy Defence Minister Colonel General Alexander for foreign military attachés in a briefing in Moscow. The exercise comes as the standoff between India and China along the Line of Actual Control (LAC) in Eastern Ladakh continues for over two years now. While disengagement has been undertaken in some areas, friction areas remain in addition to the overall de-escalation. India also defended its participation in the exercises in response to U.S. criticism.

"India has been regularly participating in multilateral exercises in Russia, along with a number of other countries," said MEA spokesperson Arindam Bagchi, stressing that the Vostok exercises were routine, and added that they would only include Army contingents. Mr. Bagchi was responding to comments by the U.S. White House Press Secretary who said that "the U.S. has concerns about any country exercising with Russia while Russia wages an unprovoked brutal war against Ukraine."

"Of course every participating country will make its own decisions," said U.S. White House Press Secretary Katherine Jean Pierre.

<https://www.thehindu.com/news/national/vostok-2022-commences-in-russia-with-india-china-participating/article65836530.ece>

The Tribune

Thu, 01 Sep 2022

India Shrugs Off US Criticism of Military Drills in Russia

India shrugged off expressions of concern by the White House over its participation in multinational military exercises in Russia. At the same time, it pointedly noted that India was participating only in the Army component of 'Vostok-2022' and not in the naval component, which will take place close to Japan.

"I want to emphasise that India has been a regular partner in multilateral exercises with Russia along with a number of countries. I understand that only the Army is taking part in Vostok exercises this year," said Ministry of External Affairs spokesperson Arindam Bagchi.

Even as 'Vostok-22' will be on, India is participating in a three-week ongoing exercise, "Pitch Black-22" with the United States and several NATO countries in northern Australia. India is among 17 nations participating in this military exercise involving about 100 aircraft and 2,500 military personnel. Despite reservations from the US, Indian troops on Thursday began a week-long multilateral strategic and command exercise at the training grounds of the Eastern Military District of Russia in Vladivostok region. It is aimed at interaction and coordination amongst other participating military contingents and observers, said an Indian Army statement.

<https://www.tribuneindia.com/news/nation/india-shrugs-off-us-criticism-of-military-drills-in-russia-427650>

Chinooks Used by IAF Do Not Have Any Problems: Boeing India President

Chinooks used by the Indian Air Force (IAF) are ‘absolutely fine’ and do not have any problems, the top executive at Boeing India said on Thursday, after the US Army grounded its fleet of CH-47 helicopters because of a risk of engine fires.

“IAF contacted our engineers after incidents were reported in the US and have been informed that there is no impact on the helicopter operated by the Indian forces,” Salil Gupte, president of Boeing India said in an exclusive interview with ANI. As per reports from the US media, the US military grounded its fleet of CH-47 Chinook helicopters after engine fires were reported from some of them. Wall Street Journal quoted US Army officials stating that they were aware of a small number of engine fires with the helicopters, and the incidents didn’t result in any injuries or deaths. The Indian Air Force (IAF) has sought details from American-based defence manufacturer Boeing on Wednesday about the reasons behind the grounding of the US Army’s entire fleet of Chinook helicopters.

The IAF operates its fleet of 15 of Boeing-made Chinook helicopters which were acquired from the US and inducted into the service in March 2019. “Indian Air Force Chinook helicopter fleet is still operational. India has sought details of the reasons which have led to the grounding of the entire fleet of US Army’s Chinook CH-47 helicopters because of a risk of engine fires,” Government officials told ANI.

“Indian Air Force Chinook helicopter fleet is still operational. India has sought details of the reasons which have led to the grounding of the entire fleet of US Army’s Chinook CH-47 helicopters because of a risk of engine fires,” Government officials told ANI when asked about the grounding of the American Army fleet.

The Indian fleet of Chinook choppers is based out of Chandigarh for operations in the north while another unit is located in Assam for taking care of the northeastern areas.

<https://theprint.in/india/chinooks-used-by-iaf-do-not-have-any-problems-boeing-india-president/1111650/>



PM Modi to Commission IAC Vikrant Today: 10 Facts You Must Know About India's First Indigenous Aircraft Carrier

Prime Minister Narendra Modi will commission India’s first indigenous aircraft carrier – Vikrant -- at Cochin Shipyard on Friday. The commissioning of the carrier, which is the largest ship ever

designed and developed in India's maritime history, will give wings to the 'Atmanirbhar Bharat' (self-reliant India) doctrine.

The carrier is christened after her illustrious predecessor, India's first aircraft carrier Vikrant, which played a vital role in the 1971 war with Pakistan. Vikrant means victorious and gallant.

With its construction, India has joined a select group of nations such as the United States, the United Kingdom, Russia, China and France, having the niche capability to indigenously design and build an aircraft carrier. Once commissioned, the aircraft carrier will contribute in ensuring peace and stability in the Indo-Pacific and Indian Ocean region, Vice Chief of Indian Navy Vice Admiral SN Ghormade had said earlier.

As the IAC Vikrant is all set to be commissioned, here are the 10 facts you must know about India's first indigenously built aircraft carrier:

- > The carrier has been designed by the Warship Design Bureau (WDB), the Indian Navy's in-house organisation and built by the public sector undertaking Cochin Shipyard Limited.
- > The foundation for IAC was established in April 2005 by ceremonial Steel Cutting. The ship's keel was laid in February 2009. The first phase of its construction was completed with its successful launch in August 2013.
- > The warship has been built using indigenous equipment and machinery supplied by India's major industrial houses as well as over 100 MSMEs. The steel required for the construction of IAC was indigenised through the Steel Authority of India Limited (SAIL) in collaboration with the Defence Research and Development Laboratory (DRDL) and the Indian Navy.
- > The aircraft carrier is 262 m long and 62 m wide. It displaces approximately 43,000 tonnes when fully loaded and has a maximum designed speed of 28 knots with an endurance of 7500 nautical miles.
- > The ship has around 2,200 compartments, designed for a crew of around 1,600 that include specialised cabins to accommodate women officers and sailors.
- > It also has a full-fledged medical complex with the latest equipment including a physiotherapy clinic, ICU, laboratories and isolation ward.
- > The Vikrant has a novel aircraft operation mode known as Short Take Off But Arrested Recovery (STOBAR) configuration, which enables short take off by planes using ski jump and recovery with the help of arrester wires.
- > The ship will be capable of operating an air wing consisting of 30 fighter aircraft (presently MiG 29K) and a mix of Kamov 31 AEW helicopters, MH 60 R Multi Role helicopters and Dhruv Advanced Light Helicopters (Marine version).
- > The aircraft landing trials on board Vikrant will begin in November and they will be completed by mid-2023, according to Ghormade. For the first few years, MiG-29K jets will operate from the warship, he added.
- > With the commissioning of Vikrant, India will have two operational aircraft carriers, which will bolster the maritime security of the nation.

<https://www.timesnownews.com/india/pm-modi-to-commission-iac-vikrant-today-10-facts-you-must-know-about-indias-first-indigenous-aircraft-carrier-article-93934773>

THE TIMES OF INDIA

Thu, 01 Sep 2022

Making at Home: Vikrant's Commissioning & Plans to Build Fifth Generation Fighters Must Speed Up Defence Self-Reliance

TOI Editorial

Two pieces of news – one engenders cautious hope and the other one brings good tidings – frame current efforts at defence indigenisation. First, CCS cleared the project to develop Tejas Mark-2, an upgraded version of the indigenous light combat aircraft Tejas Mark-1. This will be followed in the next few months with a clearance for the Rs 15,000-plus crore project to build a fifth-generation advanced medium combat aircraft. The plan is that Tejas Mark-1 will replace ageing MiG-21s while Tejas Mark-2 will gradually substitute Mirage-2000s, Jaguars and the MiG-29s. But it's only a fifth-generation fighter that will catapult India to an elite club that currently comprises the US, China and Russia.

The second piece of news is that today India's first home-built aircraft carrier, INS Vikrant, will be officially commissioned. In the works for 17 years, the indigenous carrier – more than 75% of the ship's components have been procured domestically – will certainly be a shot in the arm for the navy. Particularly in the context of the growing strategic-security challenge posed by China, which has the largest navy in the world.

Indigenisation is no longer a choice but a necessity. Just as the geopolitical environment relevant for India has become more complex, so has the cost and vulnerability of depending on foreign manufacturers become evident. New Delhi can no longer heavily rely on Russia, which is now China's "limitless" ally. There's also the budget to think of. Most hi-tech foreign purchases will be costlier than their domestically manufactured counterparts, even assuming imported components. Also, Made in India arms and defence systems will be a big fillip for Indian industry – armed forces are projected to spend around \$130 billion in capital procurement in the next five years.

It's a long and difficult road. The import content for the indigenous Tejas fighter continues to be around 50%. The key reason is reliance on foreign aero engines. The domestic Kaveri engine project failed. This time big private sector companies should be invited for joint research and development. The military-industrial complex gets a bad rep. But India needs one, as quickly as possible.

<https://timesofindia.indiatimes.com/blogs/toi-editorials/making-at-home-vikrants-commissioning-plans-to-build-fifth-generation-fighters-must-speed-up-defence-self-reliance/>

Business Standard

Fri, 02 Sep 2022

Overseeing an Ocean: INS Vikrant Joins the Navy's Fleet

By Ajai Shukla

On Friday, when Indian Naval Ship (INS) Vikrant is commissioned into the navy's fleet, we will join a group of just five countries that each operate more than one aircraft carrier. In addition to the 44,000-tonne INS Vikramaditya, bought from Russia, we will have the brand new 45,000-tonne INS Vikrant. China, Italy and the United Kingdom also have two carriers each. The United States (US) Navy – the 900-pound gorilla of aircraft carrier operations – has 11 carriers, each displacing about 100,000 tonnes, projecting American power across the globe.

While our two carriers might appear to constitute a respectable power projection capability, they would seldom translate into more than a single combat-ready carrier. The US Navy's Marine Tracker website, which tracks the deployment of major American warships, reveals that, as of August 29, only three US Navy carrier strike groups (CSG) were operationally deployed – less than a quarter of America's carriers. The US Navy also has seven Wasp-class landing helicopter docks (LHD) – amphibious assault ships that embark F-22 Osprey tilt rotor aircraft, Sea Harriers or F-35 Lightning II vertical takeoff and landing (VTOL) fighters; and a Marine Expeditionary Unit consisting of more than 2,000 combat ready marines. Of America's seven LHDs, just four are operationally deployed.

Similarly, the Indian Navy's two aircraft carriers would mostly amount to just a single operationally deployed carrier. To have two carriers operationally available, the naval fleet must have three aircraft carriers since, most of the time, one of those three would be in the dockyard for maintenance. The navy projects its requirement for two deployed carriers in simple terms: One for the east coast (the Bay of Bengal and Malacca Strait) and a second for the west coast (Arabian Sea, the Pakistan coast and West Asia). But of late, the navy brass has begun advocating for a third deployed carrier to carry out power projection at longer ranges across the Indian Ocean Region (IOR). But operationally deploying three carriers would require a four-carrier fleet. So the navy's requirement is not just for a second indigenous aircraft carrier (IAC-2) but also for a third one (IAC-3), along with its own aviation group and the destroyers, frigates, corvettes, replenishment vessels and submarines needed for three carrier battle groups (CBGs). Meanwhile, as in most navies, an internal debate rages between the "sea control" proponents of decisive naval battle, in which aircraft carriers play a decisive role; and "sea denial" advocates in which dispersed battleships and submarines occupy centre stage.

What is certain is that India would need enormous financial resources for creating such forces. Former US Senator Everett Dirksen, known for his acerbic wit, famously cautioned against how government spending spiralled out of control: "A billion here, a billion there, and pretty soon you're talking real money." However, aircraft carriers and large warships, like no other weapons platforms, have peacetime use as much as during wartime, serving as a diplomatic tool for showing the flag to allies, partners and adversaries alike. In addition, naval forces have an unparalleled capability for dispensing humanitarian aid and disaster relief (HADR), as the Indian Navy did after the Asian tsunami of 2004, earning an enviable reputation as a force that could reach all across the Indian Ocean littoral in peacetime as in war. Just as a large fleet of strategic

transport aircraft has given the Indian Air Force a capability that has utility both in peacetime and war, a fleet of large and capable warships provide the capability to reach across an ocean both in peace and in war.

The US Congress has recognised this explicitly. America's latest National Defence Authorisation Act (NDAA) – the US federal law that specifies the annual defence budget and expenditures under various heads – has for the first time given the navy legal and budgetary powers to discharge a clear peacetime, as well as its combat, role.

The new US formulation says: “The Navy shall be organized, trained and equipped for the peacetime promotion of national security interests and prosperity of the United States and prompt and sustained combat incident to operations at sea.” Inserted in bold/italics is the new wording that emphasizes peacetime and economic missions. All navies are about the overt display of presence. The newly-framed US law continues to recognise the US Navy's warfighting role, while enabling it to remain within the four corners of the law in discharging a peacetime role as well.

Given India's putative role as a net security provider in the Indian Ocean Region (IOR), and the upholder of global commons such as the sea lines of communication (SLOCs) that carry 70 per cent of global trade through these waters, the navy faces the stark question: What challenges must it overcome in discharging this role? New Delhi's regional partners in restraining a belligerent China – primarily the US, Japan, Australia and Singapore -- would like the Indian Navy to lock down the IOR, while the other partners can focus on deterring the People's Liberation Army (Navy), or PLA(N) in the vicinity of the first and second island chains in the South China Sea. This would not be easy, given the PLA(N)'s mind-boggling expansion, with Chinese warship building yards in Dalian constructing four-five large and sophisticated destroyers simultaneously.

Furthermore, commissioning a second aircraft carrier, howsoever satisfying, does little to assuage New Delhi's apprehensions about its 3,488-kilometre line of actual control (LAC), as the Sino-Indian land border is called. As a consequence of the PLA's multiple encroachments across the LAC in the summer of 2020, some of which remain to be cleared, Beijing has made sure that New Delhi's strategic attention is fixed on the LAC, rather than on the Indian Ocean. The unsettled land border with China, where it has won a war in 1962 and continues to enjoy a military advantage, remains India's primary security concern. Meanwhile the vast oceanic reaches of the Indian Ocean, which India can dominate more easily, remain at the fringes of its attention.

With India being the only member-country of the Quadrilateral that shares a land border with China, its preoccupation with the LAC is not well understood by its partner countries. The US and Australia have noted that India's stakes in the IOR are greater than in the high Himalayas. New Delhi must show resolve, they say, since India's own economic prosperity depends upon keeping open its SLOCs in the Indian Ocean. On a day when the Indian Navy commissions its second aircraft carrier, there remains a worrying lack of clarity in New Delhi about where it should focus its attention and its meagre financial resources.

https://www.business-standard.com/article/opinion/overseeing-an-ocean-ins-vikrant-joins-the-navy-s-fleet-122090101360_1.html

The Tribune

Fri, 02 Sep 2022

Today, the Whole of India is Team Vikrant

By CMDE Srikant B Kesnur (rettd)

There are moments in the life of a nation when we are united in our emotions. The nation came as a whole, at the dawn of freedom, to exult in our 'tryst with destiny'. The nation grieved together when the Mahatma was assassinated, it rallied together in the wars we fought, it went euphoric when we triumphed in the 1971 war, or when we won the cricket World Cup in 1983, when Rakesh Sharma went into outer space, or more recently, when Neeraj Chopra won our first gold medal in athletics at the Olympics. Today, the Indian Navy will produce one such moment when the indigenously built INS Vikrant is commissioned at Kochi, in the presence of Prime Minister Narendra Modi.

There are several points of reference from which to look at this spectacular achievement — the induction of the largest warship ever built in India, an aircraft carrier to boot. Let us consider them one by one. First, while it may be mere coincidence, September is a significant month for the Navy from a historical point of view. It was on September 5, 1612, when a squadron of British ships arrived at Swally, off Surat and the Honourable East India Company's Marine (also called the Indian Marine) was formed. The British and some Indian officers of an earlier era believe — incorrectly in my opinion — that this was the foundation day of the Indian Navy. Coincidentally, it was on the same date, many centuries later, on September 5, 1934, that the Indian Navy Discipline Bill was passed, after six years of deliberations, giving final legislative approval for the constitution of the Royal Indian Navy, a few days later. After Independence, INS Hansa was commissioned on September 5, 1961, and today, it is not only India's largest airbase but also has umbilical links with the aircraft carrier as it houses carrier-borne aircraft squadrons. Last year, Naval Aviation was presented the President's Colour on September 6. Even more significantly, the Indian Navy's journey of 'Making in India' began in September 1960, with the commissioning of INS Ajay, a small Seaward Defence Boat (SDB).

That leads us to the second point of reference, namely, the Indian Navy's consistent and continuing endeavours at atmanirbharta much before it was echoed in other quarters. From Ajay to Vikrant is a splendid journey of 62 years, in which the Navy has designed, and the country's shipyards have built, everything from survey ships, amphibious vessels, auxiliaries and corvettes to state-of-the-art frigates, destroyers and ballistic missile submarines. Building an aircraft carrier is the very acme of this pursuit and an achievement that the nation should justly feel proud about. It is a journey not just from 100 tonnes of Ajay to 45,000 tonnes of Vikrant, but of blood, sweat and toil as the Navy's designers, constructors, system integrators and planners battled challenges from technology denial to lack of local industrial ecosystems to produce the cutting-edge equipment that the Navy needed. And yet, because it persevered through all odds, it can reap the benefits of not just increasing the indigenous content with every succeeding ship but also contributing in a big measure to the country's industry, especially in the MSME sector.

The next point relates to its role in the operational matrix. The many virtues and unique abilities of aircraft carriers are well-known. Their emergence as the kingpins of battle in World War II

and their subsequent role in wars, power projection, in dissuasion, coercion and much else, across several theatres around the globe, is by now, well recognised. Indian Navy's planners had perceptively envisioned a Navy that had balanced fleets with a mix of different types of ships, centred around aircraft carriers. As India's heft and stature in the international community increases, there will be a commensurate rise in our interests and responsibilities, both regionally and globally. Carrier Task Forces (CTFs), as the most powerful fighting forces at sea, are best equipped to secure these interests or discharge our responsibilities. More importantly, as we face an aggressive China that is seeking to put pressure on India, in the Indian Ocean Region, the availability of adequate CTFs, is an important guarantor of security and to retain our freedom to use the seas for our benefit.

The last point relates to historical legacy. The new INS Vikrant carries forward the name of its illustrious predecessor, which served the Navy with distinction from 1961 to 1997. At that time, India was the only one amongst Asian and African nations to have an aircraft carrier and it was a matter of prestige for India. Majestic in its look and size, she was a household name with brand equity that went beyond the Navy. However, she was not about pomp and show alone. She was involved in the Goa Liberation of 1961 and her aircraft took part in the 1965 war. Her finest hour was in the 1971 war for liberation of Bangladesh when she dominated the Bay of Bengal. As the flagship of the newly formed Eastern Fleet, her dazzling exploits led to the strangulation of the then East Pakistan and the ultimate denouement of the surrender of more than 90,000 Pakistani troops. Later, as she sustained peace in a fragile neighbourhood, she also became the cradle of naval aviation responsible for grooming budding naval aviators in the tough art of flying over sea and operating from the deck. It's no surprise then that she was venerated as 'Mother' and many a tear were shed when she finally bid adieu. The new Vikrant inherits that mantle and illustrates the time space continuum that seafarers and our countrymen hold dear. Bearing the motto, translated as "we win over those who dare to fight", she carries the hopes and expectations of generations of Navy persons.

Well-intentioned critics or aircraft carrier sceptics may raise questions about the aircraft mix, the time for it to get fully operational, or the need for greater indigenisation in the 'fight' component of the carrier or even the standard ones about cost, comparison to submarines or stationery air bases as effective fighting platforms. I am sure that the Indian Navy as a dynamic, progressive and intellectually forward-looking entity, while making allowance for these doubts, will have the appropriate answers as we move forward. But for today, let us celebrate this special moment in Indian history. Today, the whole of India is Team Vikrant.

<https://www.tribuneindia.com/news/comment/today-the-whole-of-india-is-team-vikrant-427617>



Thu, 01 Sep 2022

India's Path to Self-Reliance in Defence Equipment is Long

By Rakesh Dixit

In his Independence Day speech, Prime Minister Narendra Modi called for innovation in defence products. Earlier, on July 18, he had underlined India's goal of self-reliance in defence forces

while addressing a seminar titled 'Swavlamban' organised by the Naval Innovation and Indigenisation Organisation (NIIO). Army Chief General MK Pande has said that future wars cannot be fought and won on "borrowed technology". A self-reliant defence system is critical for the economy and also from a strategic point of view.

India has come a long way

India has come a long way since 1971 when the war with Pakistan saw the Indian Navy use its aircraft carrier, INS Vikrant, and its Seahawk aircraft to blockade Bangladesh. INS Vikrant was previously known as HMS Hercules before India acquired it from the United Kingdom. On September 2, India will make history when it commissions its first 'Made-in-India' aircraft carrier. The new vessel, INS Vikrant, is named in honour of the country's first warship.

BrahMos deal with the Philippines

In January, India signed a 375-million-dollar contract for the supply of BrahMos cruise missiles to the Philippines. This constituted India's largest-ever weapons sale deal abroad. The government numbers show an encouraging trend. As a proportion of total procurement, capital expenditure on imported defence equipment declined from 41.89 per cent in 2020 to 35.28 per cent this year.

Real challenge

However, becoming self-sufficient in core technologies remains the real challenge. At present, the Tejas is powered by an American engine. India is exploring collaboration with foreign defence majors for co-producing engines for the Tejas. But the goal is still a long way ahead. The Navy's ships rely on power plants designed by foreign firms. India is hunting for a foreign conventional submarine design, despite the Make in India Scorpène initiative.

Three indigenisation initiatives

India has prepared three indigenisation projects comprising 310 items. The Make in India initiative for defence products continues to be handicapped by the absence of large orders. The indigenous defence production industry would assume significance in the days to come, not only to meet India's requirements but also to export. Since its Independence, India has pursued self-reliance, yet efforts have resulted in dismal outcomes.

Policy actions toward self-reliance

The government has initiated various policy actions to boost indigenous design, development and manufacture of defence equipment in the country and make a sustainable defence industrial ecosystem.

- One of the steps is to obtain capital goods from the indigenous market through the revised Defence Acquisition Procedure (DAP)-2020.
- Simplification of the Industrial licensing process with a more extended validity period.
- Increasing of Foreign Direct Investment (FDI) policy allowing 74% FDI under automatic route and 100% through approval of the govt.
- Execution of Public Procurement (Preference to Make in India) Order 2017.
- Restructurings of offset policy with thrust on attracting investment and Transfer of Technology for Defence manufacturing by assigning higher multipliers.
- Creating two Defence Industrial Corridors, one in UP and the other in Tamil Nadu.

- Restructuring of Ordnance Factory Board into seven new defence companies.

Hike in procurement budget

To reduce import dependence and modernise our forces with our home-grown technology, the Government has gradually increased the domestic industry's capital procurement budget. For the year 2022-23, it is 68 per cent. This would undoubtedly open various opportunities for the domestic sector.

Persistent external threats

India is an aspiring superpower. Achieving its ordained place among the elite militaries of the world requires modernising the Indian Armed Forces. Its immediate neighbourhood's continuous threat also propels the desire to modernise. The persistent clashes over unsettled boundary disputes with China and Pakistan, terrorism in Jammu and Kashmir, insurgency in the North-Eastern states, the uncontrolled menace of left-wing extremism, and the rising challenges from urban terrorism have further complicated India's security environment.

<https://www.news9live.com/defence/indias-path-to-self-reliance-in-defence-equipment-is-long-193261>



Thu, 01 Sep 2022

IAF: It is Time for Quality, Not Quantity

By Bikram Vohra

The Indian Air Force currently has a tad less than 30 squadrons with 1,960 assorted aircraft. The authorised strength is 42 squadrons, so that gives a good idea of how behind the curve we are. But is it time to reassess this moan and groan mindset and opt for quality, rather than quantity. Even as the INS Vikrant is launched officially with its 12 MiG 29s the question really is, do we need all 42 squadrons or is it more valid to patrol twin borders with a lean, mean more relevant fleet even if the airframes are few? Obsolete aircraft are sitting ducks and scarcely intimidate either China or Pakistan.

We have to invest in aircraft that take on China's J20 Mighty Dragons and Pakistan's J10C Vigorous dragons given to them by China. Like for like. Perhaps rather than try to build up what is a hotchpotch strength of multiple aircraft it is better to limit ourselves to the current 32 squadrons and stop worrying overly about being far below the 39-squadron danger mark. In a world where UAVs, unmanned drones turning into delivery systems, missile domes like the S400 actually increasingly limit the multi-roles of fighters this is where some lateral thinking makes sense.

Currently, we fly the Hawk, Mig-21, Mig-27, Mig-29, Jaguar, Mirage 2000, Su-30MKI and Tejas as well as 35 of the 36 Rafales IAF is scheduled to have. This variety demands a huge expense in maintenance, engineering and support systems. Older planes require more tender, loving care and it costs. Many of the older aircraft, notably the MIGs, are costing the lives of

young pilots during routine and training sorties. The aim today should be to augment the fleet with fifth-generation aircraft that can hold the fort, so to speak, against two hostile forces.

As things stand, India needs the 83 Tejas MK1A on order with the more powerful F414 engines to be delivered as per schedule. The Lockheed Martin F21, a fierce update of the Fighting Falcon F-16 is a strong contender for at least 110 frontline fighters. Apart from the three squadrons of tired MiG-21s we also must replace the 125 Jaguars and around 85 Mig-27MLs still in IAF service. The news of India looking at the six 'white swans' or Russian-made Tu-160 strategic bombers to offset the threat from China's incursions close to Indian air space with its H-6 bomber now possibly complimented by the stealth H-60 is sensible. A strategic bomber is a medium to long-range penetration bomber aircraft designed to drop large amounts of air-to-ground weaponry onto a distant target. Only the US, Russia and China have them. Strategic bombers are designed to fly into enemy territory to destroy specific strategic targets. This addition will give India sharp teeth.

In fighter planes, we have put our money on the Su30MK1s with 240 of the ordered 272 already in service. Our frontline needs to be given more muscle. Though the aircraft has had a troubled start, the Sukhoi Su-57 is a Russian-made fifth-generation multi-role fighter designed to destroy all types of air, ground and naval targets and Russia would be willing to give it to us. Add to this the F-21 specifically configured for the Indian Air Force, it strengthens India's path to an advanced airpower future. In its quite reasonable self-sell, Lockheed Martin says: "The F-21 addresses the Indian Air Force's unique requirements and integrates India into the world's largest fighter aircraft ecosystem with the world's pre-eminent defence company. Lockheed Martin and Tata would produce the F-21 in India. is a new aircraft with a new cockpit display, a larger airframe spine to accommodate additional electronics and a new infrared sensor and refuelling probe." The longer we wait the more porous our air defence remains and that won't help the nation sleep well at night.

<https://www.news9live.com/opinion-blogs/iaf-it-is-time-for-quality-not-quantity-193260>



Thu, 01 Sep 2022

Lessons India Must Take from China's War Games in Taiwan Strait

By Bhartendu Kumar Singh

War games carry many lessons for force mobilisation, weapons testing, and strategic posturing. In Beijing's war games in the Taiwan Strait earlier this month, China may not have gone the whole hog against Taiwan, but it did hit the oceanic waters in its north, south and west. Chinese planes and missiles crossed the median line several times, something that was not done in past. However, while these may be distant drills, India's policy-makers may still like to draw inferences for better management of futuristic Chinese offensives like frequent transgressions across the Line of Actual Control (LAC).

Critics may pooh-pooh the linkage between the two theatres since continental conflicts like the one near the LAC in the Galwan Valley are different from the maritime conflicts in the Taiwan Straits. However, Chinese People's Liberation Army (PLA) is undergoing planned stages of modernisation to improve upon capabilities and proficiencies across all warfare domains so that as a joint force it can conduct land, air, and maritime operations. Further, China is a global leader in conducting unilateral and bilateral war games. Therefore, the Taiwan Straits war games being a 'distant issue' is irrelevant since every war game has some lessons for participating, as well as observing armed forces.

In the recent war games, China displayed a quick, large, and lethal air and maritime force mobilisation, pushing the war meters up in the Taiwan Straits. However, at least in the near future, Taiwan Straits may not metamorphose into a war zone since China is still not assured of a decisive victory despite mobilising 'a million men to swim' against Taiwan. Additionally, there is a reasonable prospect of such a war spilling over into a regional war. Therefore, China may use the peripheries with its adversaries such as the LAC to replicate the lessons learnt in Taiwan Straits.

At least three derivative lessons come to the forefront. First, China may not go for full-fledged war against India. Instead, it may instigate localised wars with limited territorial targets. A look into China's territorial transgressions across the entire LAC makes one thing clear: it is targeting the whole arc for nibbling small portions of land with a strategy of 'capture some, retreat some, negotiate some, and try to retain some'.

Second, China has displayed effective use of its airpower in the just-concluded war games. Whether it was the Russian-built Sukhoi or the domestic J Series fighter planes, the aerial performances were as per exceptional benchmarks. So was the case with the multiple range of missiles. In the process, it did emerge that China may bank heavily on superior air power for futuristic transgressions across the LAC.

Third, China displayed the capabilities to enforce an air and sea blockade to Taiwan. Taiwan's air traffic was badly affected by the Chinese military drills. The international commercial cargo in the adjacent waters was also affected. It would be prudent to proliferate the lessons by contextualising the same near LAC where the Chinese are looking for vulnerable soft spots like the Siliguri Corridor or the Chicken's Neck in West Bengal.

Unlike the Taiwan crisis, the LAC is a bilateral problem, and external players are not likely to support beyond hollow statements. Also, there has been a definite shift in Chinese strategic objectives under President Xi Jinping. China is no more a satisfied party vis-à-vis India and would, in all probability, continue to play the teasing game of regular transgressions across the LAC. Unfortunately, unlike the Taiwan Straits, where enough academic research has been conducted along with simulated wars between China and Taiwan, the Sino-Indian conflict remains grossly under-researched. We do not have simulated war models being iterated in different conditions to generate original data about war probabilities, and outcomes.

Handling China's increasing military prowess has always been a policy challenge for India. While commendable domestic efforts have enhanced India's combat resilience vis-à-vis the PLA, supplementary tactical threads from distant war games would be helpful. The ongoing digital explosion on a very wide level can fetch healthy details about the combat performance of many weapons, and combat platforms. These data can facilitate combat sizing and simulated war

exercises on the China front. Probably, there lies some space for better deterrence against the PLA's frequent LAC intrusions.

<https://www.moneycontrol.com/news/opinion/can-brics-reserve-currency-diminish-dollar-dominance-9120931.html>



Thu, 01 Sep 2022

Modi, Xi Weigh Meeting as Chill Remains in Ties

India and China are weighing a first meeting between Prime Minister Narendra Modi and President Xi Jinping in almost three years, even as a chill remains in relations with an as-yet-unresolved border crisis and increasingly sharp recent exchanges between the two countries.

While this meeting could come as early as mid-September, with both leaders currently expected to be present at the Shanghai Cooperation Organisation (SCO) summit in Uzbekistan, the G20 meet in mid-November in Indonesia, where both have confirmed their attendance, offers another possibility.

A meeting does, however, come with risks for New Delhi, which has viewed warily China's recent attempts to portray ties as "normal" despite the situation at the Line of Actual Control (LAC), a perception that a high-level meet may reinforce. New Delhi reluctantly hosted Foreign Minister Wang Yi in March as he visited the region, but conveyed a strong message that India would not accept China's demand to keep the border "in an appropriate place" and restore relations.

India has since kept up that messaging in public. On Thursday, the Ministry of External Affairs (MEA) backed the German Ambassador to India's comments calling China's claims on Arunachal Pradesh as "outrageous" and its transgressions at the LAC a "violation of international law". Responding to German envoy Phillip Ackerman's comments, which had generated anger in Beijing, MEA spokesperson Arindam Bagchi said the international community has a "proper appreciation" of India's stand on boundary issues.

Mr. Jaishankar, in a speech in New Delhi on August 29, repeated for the third time in recent weeks India's stand that normalcy in ties was predicated on normalcy on the border, a position he expressed last month during visits to Australia and Brazil, saying it was not "a conditionality we are imposing" but "stating the facts" on past agreements between the two sides. China's military, for its part, last week cited those same agreements, which India has accused China of violating, to oppose upcoming India-U.S. high altitude military exercises, calling them "meddling".

Mr. Jaishankar also indicated that differences went beyond the border, and pushed back against Mr. Xi's earlier call for an "Asia for Asians", describing it as "a sentiment that was encouraged in the past, even in our own country, by political romanticism". He also cautioned, when speaking of an "Asian century", against "overtones of triumphalism with which India at least should not be comfortable".

Past meetings between Mr. Modi and Mr. Xi have been seen by both sides as helping calm border tensions — a brief conversation in July 2017 on the sidelines of a summit was seen as breaking the deadlock that led to the resolution of the stand-off in Doklam the following month. In recent months, however, the Chinese military has continued with a hardline stance on slow-moving LAC talks and refused to restore the status quo, a stand which, given Mr. Xi's apparently tight control over the People's Liberation Army (PLA), appears to be following his direction.

This will give New Delhi some pause for thought, even if both leaders appear likely to cross paths in Samarkand. According to an Uzbekistan Foreign Ministry official overseeing logistics, all preparations have been made for the summit and "heads of all eight member countries" are expected. In addition, Uzbekistan's SCO national coordinator Rakhmatula Nurimbetov has been quoted as confirming that President Ebrahim Raisi of Iran, which is due to join the SCO as a member this year, will also join.

The MEA said earlier that Mr. Modi's visit to Samarkand for the SCO summit would be announced at the "appropriate time", although a formal statement on Mr. Jaishankar's visit to Tashkent in July for the SCO Foreign Ministers' meeting said they had "discussed the preparations for the forthcoming SCO Summit of Heads of State scheduled to be held in Samarkand on 15-16 September." A factor in India's possible attendance is India taking over as the Chair of the SCO, with New Delhi hosting the summit in 2023, adding a layer of importance to Prime Minister Modi's attendance.

The Wall Street Journal reported on August 19 that Mr. Xi's office "has also begun preparing bilateral meetings on the sidelines of the summit with the leaders of Pakistan, India and Turkey, who are also making plans to attend". However, the Chinese Defence Minister being the lone absentee at the recent SCO Defence Ministers' meet has raised doubts on whether Mr. Xi will travel, with Beijing on Wednesday also announcing an all-important party congress on October 16 which will mark the start of the Chinese leader's third term. Mr. Xi has not left China, the only country to still follow a strict zero-COVID policy, since the pandemic began.

The last meeting between Mr. Modi and Mr. Xi, in Brazil in November 2019, reflected a period in the relationship that most in New Delhi now believe there is no returning to. Taking place a month after Mr. Xi's visit to Chennai for the second "informal" summit, Mr. Xi told Mr. Modi his "successful meeting" with him "went very well" and he was "willing to maintain close communication" to "jointly steer the direction of China-India relations" and "increase political mutual trust". Mr. Modi said their meetings in Wuhan and Chennai "strengthened trust and friendship". "I am looking forward to meeting with you again in China next year," Mr. Xi told Mr. Modi, following his invite for a third summit. Less than six months later, the Chinese military would send two divisions to the LAC, leading to a crisis that remains unresolved, New Delhi still searching for a "credible explanation" for what went wrong, and the leaders of the world's two largest countries essentially breaking off all communication for close to three years after meeting each other no less than 18 times in the previous six.

<https://www.thehindu.com/news/national/modi-xi-weigh-meeting-as-chill-remains-in-ties/article65837575.ece>

Thu, 01 Sep 2022

Chinese Designers Vow to Make Air-To-Air Missiles Superior to Foreign Counterparts: Chinese Media

After some of China's most powerful air-to-air missiles feared by the US have joined the recent exercises by the Chinese People's Liberation Army (PLA) around the island of Taiwan, the chief designers of those missiles said that China's current generation of missiles are leading the world, and the next generation of missiles will enjoy absolute superiority over their foreign counterparts. Since early August, the PLA Eastern Theatre Command has conducted a series of combat-oriented exercises around the island of Taiwan following US House Speaker Nancy Pelosi's provocative visit to the island that seriously violated China's sovereignty. The drills featured warplanes carrying domestically developed air-to-air missiles.

The exercises embodied the PLA's firm will, full confidence and sufficient capability to safeguard national sovereignty and territorial integrity. As makers of China's air-to-air missiles, the Aviation Industry Corporation of China (AVIC) Air-to-Air Missile Research Institute has the mission of developing world-class equipment to defend national pride and safeguard national security, said Ren Hongguang, a chief designer at the institute, at a recent press conference.

China has developed air-to-air missiles like the PL-15E and the PL-10E comparable to US' AIM-120 and AIM-9X, as well as Russia's R-77 and R-73, Ren said.

The main performance parameters of China's PL-15E and PL-10E missiles are leading the world, with some key parameters surpassing their foreign counterparts, said Wang Zheng, deputy head of the AVIC Air-to-Air Missile Research Institute.

Parameters applied to measure a missile's performance include range, speed, accuracy, damage capability and ease of use, said Fan Huitao, an academician at the Chinese Academy of Engineering, also a chief designer at the AVIC Air-to-Air Missile Research Institute.

China has seen great progress in all those five aspects, Fan said.

Some of the PLA's top warplanes like the J-20 stealth fighter jet and the J-16 multirole fighter jet are equipped with the PL-15 and PL-10 missiles.

Commander of the US Pacific Air Forces General Kenneth Wilsbach said in an online discussion event in March that US F-35 stealth fighter jets had a close contact with China's J-20 stealth fighter jets over the East China Sea at the time, and the US forces are "impressed" by them, not only the J-20s alone, but also that China's KJ-500 early warning aircraft could guide very-long-range air-to-air missiles carried by the J-20s to hit targets very far away.

The PL-15E and the PL-10E are export-ready versions of the PL-15 and the PL-10. The PL-10E is a very agile and aggressive short-range combat missile, and the PL-15E is a beyond-visual-range missile guided with a combination of inertial, satellite navigation, data link and active radar capable of hitting targets 145 kilometers away, the Global Times learned.

In another provocative move, the Biden administration plans to formally ask Congress to approve an estimated \$1.1 billion arms sale to Taiwan, including 100 AIM-9X air-to-air missiles for \$85.6 million, US media reported on Monday. China's next generation air-to-air missiles will receive innovations to suit the needs of modern informationised warfare, enjoy absolute superiority over opponents and surpass the world's top level, Ren said.

<http://www.indiandefensenews.in/2022/09/chinese-designers-vow-to-make-air-to.html>

AIRFORCE TECHNOLOGY

Thu, 01 Sep 2022

Boeing Wins US MDA's Ground-Based Midcourse Defence SITR Contract

Boeing has been awarded a ground-based midcourse defence (GMD) system integration, test, and readiness (SITR) contract by the US Missile Defense Agency (MDA).

The indefinite-delivery, indefinite-quantity (IDIQ) contract has a ceiling value of \$5.02bn.

As part of this SITR contract, Boeing will be responsible for the overall GMD element engineering and integration, along with the logical and physical integration of GMD elements and components.

The agreement will also include the integration of GMD with the Missile Defence System as well as planning and execution of the necessary assessments to validate overall requirements compliance.

Furthermore, the contract involves Boeing performing day-to-day systems operations, maintenance functions, readiness and analysis associated with GMD element health and availability. The company will also execute failure or fault checklists, as required.

Boeing Missile and Weapon Systems and Huntsville site senior executive general manager and vice-president Cindy Gruensfelder said: "Boeing's proposal offered decades of experience in weapon systems integration, anchored by the unique expertise of our people.

"We're proud to continue to support mission-readiness of this critical missile defence capability for the nation."

According to the US Department of Defense (DoD), a task order of approximately \$506.6m has also been issued at the time of this contract.

Around \$4.5m in research, development, test and evaluation funds for the fiscal year 2022 are also being provided for this award.

The period of this task order starts from 1 September 2022 and will conclude on 31 August 2027.

Work will majorly be carried out at the company's facility in Huntsville, Alabama, US. Boeing claimed that the company is 'well-positioned' to commence the work under the STIR contract, with an established infrastructure, workforce and supply chain.

<https://www.airforce-technology.com/news/mda-ground-midcourse-defence-boeing/>

Thu, 01 Sep 2022

How Would Taiwan's Planned US\$143 Million Defence System Ward Off Drones from Mainland China?

By Liu Zhen

Taiwan plans to deploy a NT\$4.35 billion (US\$143 million) drone defence system on its offshore islands to ward off frequent harassment by mainland Chinese drones, a move underscored by the island shooting down an unidentified drone on Thursday.

What is it and will it work?

Although this coincides with the latest US\$1.1 billion arms deal announced by the White House, it is not part of it. The Taiwanese have ordered a home-made product.

The remote-controlled unmanned aerial vehicle (UAV) defence system is being developed by the National Chung-Shan Institute of Science and Technology (NCSIST), the island's major military research and development body, whose other products include Sky Bow air defence missiles and Hsiung Feng anti-ship missiles.

Meanwhile, the new weapons for which the Biden administration seeks congressional approval include 60 AGM-84L Harpoon Block II anti-ship missiles for US\$355 million, 100 AIM-9X Block II Sidewinder tactical air-to-air missiles for F-16s for US\$85.6 million, and US\$655.4 million for a surveillance radar contract extension.

Detection and jamming

The anti-drone system has been designed primarily to detect and jam small UAVs.

An NCSIST introduction video highlights the drone's search radar that can detect an encroaching UAV and identify it using a camera and frequency detection. When it is clear the intruder is an enemy drone, an electronic jamming system will disrupt its controls before a retrieval drone captures the invading UAV with a net.

This system could be used for "security defence, airport protection, coastal security protection and monitoring, border security protection, important facilities and incident protection, terrorist attack protection", the NCSIST website said.

Taiwan's defence ministry last week announced it had completed plans to establish the remote defence system "to deal with the incursion of civilian drones", according to local media.

The ministry plans to deploy the system over the next four years at all bases, ports, and airports as well as on 45 offshore islands and isolated camps, high mountain platforms, missile positions and other important agile camps. The ministry said any drones invading those areas would be sought, found and disrupted.

The ministry signed an agreement with NCSIST in May for the first batch of trunk-mobile UAV defence systems costing US\$657 million and they are expected to install them in 2023 with priority given to offshore island posts to deal with “grey-zone threats”.

Taunted by drones

On Thursday, the island’s defence ministry said it had shot down an unidentified drone over a tiny island off the coast of the Chinese mainland. It was the first time Taiwanese forces have shot down a drone over territory controlled by Taipei.

Frequent civilian drone visits have become a problem for the Taiwanese military and on Tuesday, the island’s President Tsai Ing-wen ordered the military to take “necessary and strong” countermeasures, which was interpreted as authorisation to shoot them down.

Last week, a video of Taiwanese soldiers throwing stones at a mainland drone emerged on mainland Chinese social media. It attracted millions of views and sparked heated discussion on both sides of the strait. The Taiwanese military said a civilian drone buzzed a guard post on August 16 on Erdan, a tiny island near the mainland coast.

Taiwanese social media users labelled the incident a “humiliation” while Beijing’s foreign ministry spokesman Zhao Lijian said “China’s drone took a flight over China’s territory” and there was nothing to make a fuss about.

The provocative footage encouraged many followers online. And apparently, it is not too difficult for even cheap, toylike civilian drones to fly to the Quemoy island chain, also known as Kinmen, which at the nearest point is less than 2km (1.2 miles) from the mainland. On Wednesday, one mainland social media account published several drone videos taken over guard posts on the Quemoy islands, claiming they were taken on Tuesday and Wednesday.

The Quemoy defence command said four drones had come from Xiamen city on the mainland on Tuesday and there were three more civilian drones between 6pm and 8pm on Wednesday.

For the first time, the soldiers fired bullets, but the drones safely returned to Xiamen.

Growing field of drone attack and counter-attack

As the PLA steps up its presence around Taiwan, it has increased the frequency of UAV flights in the area. In a recent case, the Japanese Ministry of Defence reported spotting a mainland TB-001 medium-altitude, long-range (MALE) combat and reconnaissance drone off Taiwan’s east coast. The TB-001 Twin-Tailed Scorpion has a top speed of more than 300km/h (186mph), a ceiling of 8,000m, a 3,000km range and 35 hours endurance time. Many countries have focused research and development on measures to tackle large fixed-wing drones, which have come to play an increasingly greater role in modern conflict. Common measures include powerful electronic suppression, high-energy weapons such as laser or microwave weapons, kinetic weapons or even conventional air defence guns and missiles.

Another popular approach is to use drones to counter other drones. Raytheon’s Coyote is an example. When flying near its target fixed-wing drone, it either detonates its warhead to destroy the target, or hits to kill it without exploding.

https://www.scmp.com/news/china/military/article/3190957/how-would-taiwans-planned-us143-million-defence-system-ward?module=perpetual_scroll_0&pgtype=article&campaign=3190957

Taiwan Shoots Down Drone for First Time Off Chinese Coast

Taiwan's military for the first time shot down an unidentified civilian drone that entered its airspace near an islet off the Chinese coast on Thursday, after the government vowed to take tough measures to deal with an increase in such intrusions. Beijing, which claims Taiwan as its own against the strong objections of the Taipei government, has held military exercises around the island since early last month in reaction to a visit to Taipei by U.S. House of Representatives Speaker Nancy Pelosi.

Taiwan's government has said it will not provoke or escalate tensions but has been particularly angered recently by repeated cases of Chinese drones buzzing islands controlled by Taiwan close to China's coast. The defence command for Kinmen, a group of Taiwan-controlled islands opposite China's Xiamen and Quanzhou cities, said in a statement released by Taiwan's defence ministry that the drone entered restricted air space over Lion Islet just after midday (0400 GMT).

Troops on the islet tried warning it away but to no effect, so shot it down, with the remains landing in the sea, it added. Taiwan fired warning shots at a drone for the first time on Tuesday shortly after President Tsai Ing-wen ordered the military to take "strong countermeasures" against what she termed Chinese provocations.

China's foreign ministry, which on Monday dismissed Taiwan's complaints about drones as nothing "to make a fuss about", referred questions to the defence ministry, which had yet to comment. Chiu Chui-cheng, deputy head of Taiwan's China-policy making Mainland Affairs Council, told reporters in Taipei that Taiwan had the legal authority to take "necessary defence measures", as Chinese aircraft were not allowed into Kinmen's air space.

Those measures include forcing aircraft to leave or to land, he said.

Speaking to the armed forces earlier on Thursday, Tsai said China was using drones and other "grey zone" tactics to try to intimidate Taiwan, her office cited her as saying in a statement.

Tsai again emphasised that Taiwan would not provoke disputes but that did not mean that it would not take countermeasures, the statement added.

"She has also ordered the Ministry of National Defense to take necessary and strong countermeasures in a timely manner to defend national security," it said.

"Let the military guard the country without fear and with solid confidence." Taiwan has controlled Kinmen, which at its closest point is a few hundred metres (feet) from Chinese territory, since the defeated Republic of China government fled to Taipei after losing a civil war to Mao Zedong's communists in 1949.

During the height of the Cold War, China regularly shelled Kinmen and other Taiwanese-held islands along the Chinese coast, but they are now tourist destinations.

<https://indianexpress.com/article/world/taiwan-shoots-down-drone-for-first-time-off-chinese-coast-8124947/>

Science & Technology News



Press Information Bureau
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Ministry of Science & Technology

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Hydration of Proteins Could Act as a Potential Marker for an Early Detection of Neuro-Degenerative Diseases

Hydration dynamics of proteins plays a pivotal role in the aggregation of several proteins which is a preliminary step towards various neuro-degenerative diseases. Thus aggregation process could be spotted early by detecting altering water network dynamics and modulated using inactive substances that serve as the vehicle or medium for a drug or other active substance. Understanding debilitating neuro-degenerative diseases at the molecular level is crucial to find treatments or solutions for them. A phenomenon called 'liquid liquid phase separation' (LLPS) underlines the formation of cells organelles like P bodies, nucleolus which are membrane-less compartments in the cytoplasm of cells. LLPS, a self-aggregated system, is an intermediate step during the formation of the stable protein aggregates. When multivalent proteins interact they undergo rapid transformation from small complexes to large polymeric assemblies with increase in protein concentration.

This dense phase often resembles liquid droplets exhibiting higher protein density and weaker molecular motion than the surrounding medium. This process, initiated through liquid liquid phase transfer, plays crucial role in inducing human diseases, especially age-related neuro-degenerative diseases like Alzheimer's disease, Parkinson's disease and cataract. Therefore, understanding the process of phase separation at a molecular level has become an emergent area of research in molecular biology fraternity.

Scientists at the S.N Bose National Centre for Basic Sciences, an autonomous institute of the Department of Science and Technology (DST) have explored how the hydration of proteins, gets altered as LLPS sets in. The researchers have spotted the crucial role of water in Liquid liquid phase separation which holds the key to neuro-degenerative diseases. They found that some excipients or inactive substance that serves as the vehicle or medium for a drug or other active substance like sucrose can stabilise LLPS while some can inhibit it. Thus aggregation process of these diseases could be modulated by altering water network dynamics using these excipients.

In a paper published in *J. Phys. Chem. Lett* the scientists, under the leadership of Prof. Rajib Kumar Mitra, examined four excipients ---arginine, glucose, ubiquitin, and bovine serum albumin. Some excipients like sucrose were found to stabilize the LLPS process while Bovine Serum Albumen (BSA) was found to inhibit the process.

Their experiments have identified that both protein and excipient hydration are important in regulating the LLPS process. Monitoring a change in hydration could therefore act as a potential marker for an early and easy detection of LLPS onset.

Publication link: <https://doi.org/10.1021/acs.jpcclett.1c03449>

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1856023>

The Tribune

Thu, 01 Sep 2022

1st Indigenous Cervical Cancer Vaccine by December

India today unveiled the first indigenous quadrivalent human papillomavirus vaccine (qHPV), called Cervavac, for the prevention of cervical cancer, the second-most common cancer affecting young women in India after breast cancer.

India accounts for one-fourth of all global deaths from the condition and 90 per cent mortality due to this cancer is in low and middle income countries.

A third major example of public-private partnership in vaccine development — after Rota virus

and Covid vaccines — the qHPV shot has been developed by the Department of Biotechnology and the Serum Institute of India, Pune.

Adar Poonawalla, SII Chief Executive Officer, who was present on the occasion, said the shot would be available in a few months. “We will give it to the country first and the world later. It may be priced between Rs

20 cr doses in 2 yrs

Will give to India first. We are gearing up to make 20 crore doses over two years. Adar Poonawalla, SII CEO

Moment of pride

We're here to celebrate script writers of this story of scientific discovery and self-reliance. Jitendra Singh, MOS

2 doses for 9 to 14-year-olds, 3 for 15-26 age group

1.25 lakh Indian women diagnosed with cervical cancer each yr

75,000 of them succumb to cancer annually

1/4th of all cervical cancer deaths in India

- India accounts for one-fourth of all global deaths from cervical cancer
- In July, DCGI had granted vaccine market authorisation approval
- Targets HPV strains 16 & 18, responsible for 83% of invasive cervical cancers
- SII has pledged one crore doses to the government by the year-end

Vax should cover boys too, says expert

200 and Rs 400, but the final prices will be fixed later. We are preparing to make 200 million doses in two years,” Poonawalla said.

The SII has pledged one crore doses to the government by the year-end for a possible inclusion of Cervavac in the national immunisation plan.

In July, the Drug Controller General of India had granted the vaccine market authorisation approval. Launching the shot today, Minister of State for Science and Technology Jitendra Singh

said an affordable and safe vaccine marked an important day for the Department of Biotechnology and took India closer to the vision of Atmanirbhar Bharat.

The vaccine is significant as it targets high-risk HPV strains 16 and 18, which are responsible for 83% of all invasive cervical cancers in India and 70% worldwide.

An estimated 1.25 lakh Indian women are annually diagnosed with cervical cancer and over 75,000 die from the disease. "We are here to celebrate the script writers of this story of scientific discovery and self-reliance," Singh said, praising biotechnology secretary Rajesh Gokhale and his team.

AIIMS obstetrics and gynaecology professor Neerja Bhatla, who has been involved with the vaccine development, said it was safe and effective with evidence from vaccine use in the UK and Nordic countries showing fast reduction in cancers. Bhatla called for administering the shot to boys too to prevent HPV-induced cancers and genital warts in them.

<https://www.tribuneindia.com/news/nation/1st-indigenous-cervical-cancer-vaccine-by-dec-427632>

Business Standard

Thu, 01 Sep 2022

Road Ministry Amends Battery Safety Norms, to Come into Effect from Oct 1

Concerned over cases of fire incidents observed in electric two-wheelers, the road transport ministry has introduced additional safety provisions in the battery safety standards which will come into effect from October 1, according to an official release.

The amendments include additional safety requirements related to battery cells, on-board charger, design of battery pack, and thermal propagation due to internal cell short circuit leading to fire.

The notification to mandate amended standards for the respective categories of electric vehicles with effect from October 1, 2022, is in progress, the release said.

In April this year, cases of electric two-wheelers of manufacturers such as Ola Electric, Okinawa Autotech and PureEV catching fire were reported. It prompted the government to form a panel to examine.

"Based on the recommendations of the expert committee report, the ministry on August 29, 2022, has issued amendment to AIS 156- Specific requirements for motor vehicles of L category with electric power train, and amendment 2 to AIS 038 Rev. 2 - Specific requirements for Electric Power Train of motor vehicles of M category and N category (motor vehicle with at least four wheels used for carrying goods which may also carry persons in addition to the goods)," the release said.

L category motor vehicles are those with less than four wheels and is a quadricycle while M category vehicles are at least four wheels used for carrying passengers.

"The notification to mandate amended AIS 156 and AIS 038 Rev.2 standards for the respective categories of electric vehicles with effect from October 1, 2022 is in progress," it said.

The release said the ministry also has issued a draft notification on August 25, 2022, to amend Sub-rule 4 of Rule 124 of Central Motor Vehicles Rule (CMVR) 1989, for mandating Conformity of Production (COP) for traction batteries used in electric power train vehicles.

The MoRTH had constituted an expert committee, chaired by ARCI Hyderabad director Tata Narsingh Rao, Centre for Fire, Explosive & Environment Safety (CFEES) scientist M K Jain, Indian Institute of Science principal research scientist Subba Reddy and IIT Madras professor Devendra Jalihal as members to recommend additional safety requirements in the existing battery safety standards notified under CMV Rules.

Taking the EV fire accidents into consideration, road transport and highways minister Nitin Gadkari in April warned companies of penalties if they were found to be negligent and said they would be ordered to recall the defective vehicles.

Subsequently, Ola Electric recalled 1,441 units of its electric two-wheelers. Okinawa also announced its recall of 3,215 units of its Praise Pro electric scooter to fix any issue related to batteries. Similarly, Pure EV recalled 2,000 units of its ETrance+ and EPluto 7G models.

https://www.business-standard.com/article/economy-policy/road-ministry-amends-battery-safety-norms-to-come-into-effect-from-oct-1-122090101319_1.html

