October
2022

समाचार पत्रों से चयित अंश
Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology

खंड : 47 अंक : 191 08-10 अक्टूबर 2022

Vol.: 47 Issue: 191 08-10 October 2022

रक्षा विज्ञान पुस्तकालय
Defence Science Library
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र
Defence Scientific Information & Documentation Centre
मेटकॉफ हाउस, दिल्ली - 110 054
Metcalfe House, Delhi - 110 054

CONTENTS

DRDO News

DRDO Technology News

ThePrint

Air Force Day: Supersonic BRAHMOS – IAF's Unparalleled Tactical Asset

Indian Air Force – one of the mightiest air powers in the world – has been swiftly and comprehensively enhancing its operational capabilities and strategic outreach by inducting new-generation platforms, weapons and related systems to bolster its combat power and war-readiness in the backdrop of rapidly evolving geopolitical landscape. The acquisition of multi-role capability of platforms and equipment, along with multi-skill capability of its personnel has emboldened the IAF to steadfastly safeguard Indian skies.

A stand-off weapon with unmatched speed, precision and firepower which has galvanized the IAF's modern air combat capability manifold is supersonic cruise missile BRAHMOS. The formidable tactical weapon in its advanced air-launched configuration arming the IAF's frontline Sukhoi-30MKI strike aircraft has emerged as an "unparalleled weapon-platform combination" having the lethality to completely decimate strategic ground- and sea-based enemy targets with pin-point accuracy. The powerful BRAHMOS air-launched cruise missile (ALCM) system, designed, developed and produced by BrahMos Aerospace – the India-Russia Joint Venture (JV) defence entity involving DRDO and NPOM – has been inducted in the Indian Air Force in January 2020. The formidable "Tigersharks" squadron consisting the Su-30MKI-BRAHMOS-A weapon-platform combination has enormously sharpened and widened the IAF's modern aerial warfare potentiality. The convergence of the airborne missile's unmatched capabilities with the frontline fighter platform's superior, super-manouverable air power has outclassed any other such system worldwide.

As the heaviest and deadliest weapon to arm a long-range, air superiority fighter aircraft, BRAHMOS-A is capable of annihilating strategic sea and ground-based enemy targets from within and beyond visibility range. The Sukhoi-30MKI's capability to launch the weapon from large, stand-off ranges without getting closer to enemy positions renders it an unparalleled edge. With its impeccable anti-ship and land-attack power, supersonic BRAHMOS-A underwent a series of successful test firings prior to its induction in the IAF. The formidable weapon established its superlative performance to neutralise both maritime and ground-based targets in day-and-night, all-weather conditions from stand-off ranges.

Today, BRAHMOS ALCM has positioned itself as the world's most powerful conventional air-borne precision strike weapon in terms of range, lethality and effectiveness. In a landmark development, the ALCM became India's first indigenous weapon of such class and caliber to

receive the “fleet release clearance” certification from Bengaluru-based Centre for Military Airworthiness and Certification (CEMILAC), DRDO, in June 2020. The FRC certification paved the way for the pilots of IAF squadrons to use the tactical missile during combat missions.

The universal BRAHMOS, having been deployed with Indian Army and Navy, has become India’s ‘ultimate weapon of choice’ to undertake network-centric warfare operations. The IAF has also raised BRAHMOS land-attack (LACM) squadron to safeguard territorial integrity.

The commissioning of BRAHMOS-airbone weapon in the IAF has made India the first and only country in the world to complete its “supersonic cruise missile triad.” All three services of India conducted a series of successful test firings of supersonic BRAHMOS from ground, sea and air platforms between October and December 2020 as part of “capacity enhancement” and also to ensure the missile’s “war-readiness”. The fire & forget, quick-reaction BRAHMOS reaffirmed its flexibility and credence to be swifty deployed in any kinds of terrain and from various platforms over longer distances at a very short notice. The Indian Air Force in May 2022 conducted successful test firing of an enhanced variant of BRAHMOS air-launched weapon system. The missile scored a direct hit against the designated target in the Bay of Bengal, thus proving its mettle yet again.

BrahMos Aerospace, the manufacturer of BRAHMOS Weapon System, has expedited the indigenisation work on the missile system. In close coordination with DRDO, the JV entity has been successful in indigenising several critical technologies and components of BRAHMOS, thus enhancing India’s national security parameters and at the same time, reducing the tactical weapon’s overall production and maintenance costs.

“As a top-of-the-line precision guided weapon, BRAHMOS has evolved over the years. We have continuously upgraded, enhanced and incorporated new, highly advanced featured in the missile system to improve its overall performance parameters. The number of developmental trials and user trials of BRAHMOS carried out so far having an unmatched success rate speaks volumes about this unique missile system which we have delivered to the Indian Armed Forces. BRAHMOS has hugely bolstered India’s combat potential in the 21st century,” says Atul Dinkar Rane, CEO & MD of BrahMos Aerospace.

The year 2022 has marked yet another glorious milestone for the BrahMos JV with the formidable BRAHMOS becoming India’s first full-fledged weapon to enter the international export market. On January 28, 2022, BrahMos Aerospace has signed a historic export contract with the Republic of Philippines to deliver the shore-based BRAHMOS anti-ship weapon system to the Armed Forces of Philippines. “As part of Govt of India’s policy of promoting responsible defence exports, we have received the multi-million dollar contract from the Republic of Philippines. This contract is an outstanding outcome of BrahMos JV’s ‘Make to Market’ strategy. We now intend to take this momentum forward to achieve more successful results on the exports front. Many countries across continents have evinced strong interest in the versatile BRAHMOS and we are very hopeful to achieve more and more export breakthroughs in near future,” says Dr. Sanjeev Kr Joshi, Deputy CEO of the India-Russia BrahMos JV.

With several nations operating the Russian-origin Sukhoi-30 fighter platform, the powerful BRAHMOS-A, in particular, has emerged as a potential weapon of export for their air forces. BrahMos JV in the meanwhile has also started work on a new smaller, lighter BRAHMOS configuration which would be called BRAHMOS-NG (next-generation). With its reduced dimensions, the new weapon would be compatible for fitment onboard a wider number of

modern military platforms – land, sea, air – that too, in more numbers. Once developed and tested successfully, the highly advanced BRAHMOS-NG would hold immense potential to accelerate India's defence export aspirations to newer heights. BrahMos JV would lead from the front to boost India's status as a net exporter of weapons in the coming years.

https://theprint.in/theprint-valuead-initiative/air-force-day-supersonic-brahmos-iafs-unparalleled-tactical-asset/1158153/

Defence News

Defence Strategic : National/International

THE ECONOMIC TIMES

Sat, 08 Oct 2022

Droupadi Murmu, Rajnath Singh Witness IAF Prowess on First Air Force Day Celebrations Outside Delhi-NCR

A dazzling show by a fleet of military aircraft over the Sukhna Lake here enthralled the gathering, including President Droupadi Murmu, who clapped during their breathtaking maneuvers as the Indian Air Force marked its 90th anniversary celebrations on Saturday. It is the IAF's first annual Air Force Day parade and fly-past outside the Delhi-National Capital Region, which also saw the participation Defence Minister Rajnath Singh. Governors of Punjab and Haryana Banwarilal Purohit and Bandaru Dattatreya, Haryana Chief Minister Manohar Lal Khattar and Chandigarh MP Kirron Kher were present too. Prior to the spectacular aerial display, a ceremonial parade was held at the air force station here in the morning in the presence of Air Chief Marshal V R Chaudhari. Murmu was accorded the guard of honour upon her arrival here. This is her first visit to Chandigarh as the President of India.

The recently inducted and indigenously built Light Combat Helicopter (LCH) 'Prachand' also showcased its aerial prowess during the fly-past in a three-aircraft formation. Developed by state-run aerospace major Hindustan Aeronautics Ltd (HAL), the 5.8-tonne twin-engine LCH is armed with air-to-air missiles, 20 mm turret guns and rocket systems, and is capable of destroying enemy tanks, bunkers, drones and other assets in high-altitude regions.

Several other aircraft, including Light Combat Aircraft (LCA) Tejas, Sukhoi, Jaguar, Rafale, IL-76, C-130J and Hawk were part of the fly-past. Among the helicopters, Advanced Light Helicopter Dhruv, Chinook, Apache and Mi-17 were part of the aerial display. The fly-past commenced with an 'Aakash Ganga' team of paratroopers in an AN-32 aircraft. Mi

17 V5 choppers showed their capability to undertake a fire-fighting operation using a 'bambi bucket', while Mi17 IV helicopters performed helocasting. The US-made Chinook choppers, which are used for transporting troops, artillery etc, were also part of the spectacular display.

Rafale, Jaguar, Tejas and Mirage 2000 flew in 'Sekhon' formation, which is dedicated to IAF officer and Param Vir Chakra recipient late Nirmaljit Singh Sekhon. The packed crowd was also enthralled by 'Ensign' formation comprising three Mi-17 V5 helicopters. The 'Globe' formation comprised a C-17 heavy lift aircraft and nine Hawk-132 jets trained by the Surya Kiran display team. The 'Eklavya formation' comprised an Mi-35 aircraft in lead with two Apache and ALH Mk IV helicopters, while the 'Big Boy' formation consisted of an IL-76 and two AN-32 aircraft.

The IAF's vintage aircraft Harvard and Dakota also made an appearance in the air show. Among the formations was 'Vajraang', comprising C-130 J and Sukhoi-30, and 'Netra' by the airborne early warning and control aircraft, Sukhoi-30 and MiG-29 fighter jets. The city administration arranged buses from to ferry people to and back from the air show. Tight security arrangements were put in place ahead of the celebrations. Air Force Day marks the official induction of the IAF in 1932. Every year, the day is celebrated in the presence of the force's chief and senior officers among other dignitaries.

https://m.economictimes.com/news/defence/chandigarh-droupadi-murmu-rajnath-singh-witness-iaf-prowess-on-first-air-force-day-celebrations-outside-delhi-ncr/amp_articleshow/94728254.cms#amp_tf=From%20%251%24s&aoh=16653736951595&referrer=https%3A%2F%2Fwww.google.com

जागरण

शनिवार, 08 अक्टूबर 2022

भारतीय वायुसेना की 'नई युद्धक वर्दी' कई मायनों में है बहुत खास, डिजिटल कैमोफ्लाज पैटर्न में किया गया डिजाइन

भारतीय वायुसेना (Indian Air Force) शनिवार को अपना 90वां वर्षगांठ मना रही है। इस दौरान वायुसेना ने अपनी नई युद्धक वर्दी को पेश किया है। वायुसेना की यह नई युद्धक वर्दी (New Combat Uniform) कई मायनों में बहुत खास है। इस साल की शुरुआत में भारतीय सेना (Indian Army) ने भी अपनी नई वर्दी लॉन्च की थी। IAF की यह वर्दी भारतीय सेना की वर्दी से मिलती जुलती है।

नई युद्धक वर्दी की ये हैं खासियत

भारतीय वायुसेना द्वारा आज लॉन्च हुई युद्धक वर्दी में खास बात यह है कि इसके इस्तेमाल के बाद रेगिस्तान के थार में, पहाड़ों पर, बर्फ के मैदान में दुश्मनों से मुकाबला करने में वायुसेना

के जवानों को खास मदद मिलेगी। नई वर्दी में विशेष प्रकर के जूते शामिल किए गए हैं और इसका निर्माण पूरी तरह से भारत में किया गया है।

डिजिलटल कैमोफ्लाज पैटर्न में किया गया डिजाइन

भारतीय वायुसेना की इस युद्धक वर्दी को डिजिटल कैमोफ्लाज पैटर्न (Digital Camouflage Pattern) में डिजाइन किया गया है। भारतीय वायुसेना की वर्दी का यह एक अलग फैब्रिक और डिजाइन है। वर्तमान में कैमोफ्लाज यूनिफॉर्म (Camouflage Uniform) का उपयोग वायुसेना द्वारा ग्राउंड ड्यूटी भूमिकाओं के लिए किया जाता है।दुनियाभर की अधिकांश सेनाएं भी कैमोफ्लाज यूनिफॉर्म (Camouflage Uniform) में अपने आपको बदल चुकी हैं।

भारतीय वायुसेना द्वारा आज लॉन्च हुई युद्धक वर्दी में खास बात यह है कि इसके इस्तेमाल के बाद रेगिस्तान के थार में पहाड़ों पर बर्फ के मैदान में दुश्मनों से मुकाबला करने में वायुसेना के जवानों को खास मदद मिलेगी।

युद्धक वर्दी पुरानी वर्दी से है काफी अलग

भारतीय वायुसेना के एक अधिकारी ने बताया कि इस नई युद्धक वर्दी के रंग पुरानी वर्दी से काफी अलग हैं। आज लॉन्च हुई यह वर्दी वायुसेना के जवानों के काम करने के माहौल के अधिक अनुकूल है। अधिकारी ने बताया कि विशेष रूप से नई वर्दी को कुछ हद तक इस साल की शुरुआत में भारतीय सेना (Indian Army) द्वारा लॉन्च की गई डिजिटल पैटर्न के समान है।

वर्दी में एक अलग तरह के कपड़े का किया गया इस्तेमाल

नए पैटर्न के अलावा भारतीय वायुसेना की वर्दी में एक अलग कपड़े का इस्तेमाल किया गया है। यह कपड़ा शरीर के लिए बेहद हल्का है। नई वर्दी की यह डिजाइन वायुसेना के जवानों को आराम और दक्षता को बढ़ाता है। एर्गोनोमिक फिटिंग एक ऐसी विशेषता है, जो ड्यूटी पर तैनात

पुरुष और महिला दोनों ही कर्मियों को अपनी परिचालन क्षमता को और अधिक सुगम बनाती है। भारतीय वायुसेना की यह वर्दी सभी इलाकों और मौसमों के लिए अनुकूल है।

1932 में सेना का हुआ था गठन

बता दें कि भारतीय वायुसेना (IAF) दुनिया की चौथी सबसे बड़ी ऑपरेशनल एयर फोर्स है। इसका गठन 1932 में यूके रॉयल एयरफोर्स (UK Royal Air Force) के सपोर्टिंग फोर्स के रूप में आज ही के दिन हुआ था। भारत की आजादी के बाद वायुसेना का नाम बदलकर भारतीय वायुसेना कर दिया गया।

https://www.jagran.com/news/national-indian-air-force-new-combat-uniform-is-very-special-in-many-ways-23126256.html

FINANCIAL EXPRESS
Read to Lead

Sat, 08 Oct 2022

IAF Gets a New Weapon System Branch- All You Want to Know

In a first after Independence, coinciding with the 90th anniversary of the Indian Air Force a new operational branch has been created — Weapon Systems (WS) Branch. This was announced by the IAF chief Air Chief Marshal VR Chaudhari at the air force parade at Chandigarh on Saturday. According to an official statement issued by the Ministry of Defence this will help in the unification of all weapon system operators under one entity which will be dedicated to the operational employment of all ground-based and also specialist airborne weapon systems.

More about the Weapon Systems Branch: In his address at the Parade the IAF Chief said that these four sub-streams are mainly to man four specialised streams including: remotely-piloted aircraft, surface-to-air missiles; surface-to-surface missiles, and weapon system operators in twin- and multi-crew aircraft. This will be divided into four sub-streams and each will have its own skill set. This means that each branch would induct cadre of officers with specialised skills. According to the IAF Chief this will also help in savings of almost Rs 3, 400 crore as it will reduce the expenditure on flying training.

First on the list is `Flying': This will have officers who will be weapons systems operators in twin-engine twin seater fighter aircraft, the Su-30 MKI (IAF has around 265 in its fleet). Also, those flying Attack helicopters which are all twin-set versions and this category includes the latest Light Combat Helicopter, Apache AH-64E from Boeing, and Mi -25/35 the Russian make.

Second sub-stream is Remote: The operators of the UAVs which were inducted in the service include the domestic armed version of the UAVs and also in the future operators of the Predator drones from the US based General Atomics.

Third sub-stream is Intelligence: This sub-stream will have analysts of imagery which has been obtained through surveillance carried out by the UAVs or through satellites. There will be

information warfare specialists; analysts of intelligence inputs, observers and signal intelligence collation. And also, operators of space systems will be part of this sub-system.

Fourth sub-stream is Surface: Besides the newly inducted S-400 air defence system from Russia, there will be mission commanders, and also operators of surface-to-surface missiles, surface-to-air guided weapons and other than close-in weapons systems.

https://www.financialexpress.com/defence/iaf-gets-a-new-weapon-system-branch-all-you-want-to-know/2704380/lite/

नवभारत टाइम्स

सोमवार, 10 अक्टूबर 2022

अगले दशक के मध्य तक होंगी जेट की 35 स्क्वॉड्रन

Poonam.Pandey@timesgroup.com

■ **नई दिल्ली:** भारतीय वायुसेना के पास अभी 31 फाइटर स्क्वॉड्रन हैं, जबकि इसके लिए मंजूर संख्या 42 है। एयरफोर्स को इस नंबर तक पहुंचने में कुछ दशकों का वक्त लगेगा। ऐसे में क्या एयर फोर्स स्क्वॉड्रन के लिए अथॉराइज्ड (मंजूर) संख्या को कम करने की सोच रही है? इस बारे में वायुसेना प्रमुख एयर चीफ मार्शल वी.आर. चौधरी ने कहा कि नंबर कम करने का सवाल ही नहीं है, क्योंकि मौजूदा नंबर से पूरे देश में चौबीसों घंटे एयर डिफेंस की निगरानी करना और एयर पट्रोलिंग करना मुमकिन नहीं है।

एयर चीफ चौधरी ने कहा कि हालांकि 42 फाइटर स्क्वॉड्रन का लक्ष्य अगले कुछ दशक तक हासिल करना मुश्किल है, लेकिन हमें इतने नंबर चाहिए। मौजूदा हालात में एयर फोर्स के पास जो जिम्मेदारी है, उसे देखते हुए एयर फोर्स को 42 स्क्वॉड्रन की जरूरत है। जब दुश्मन से भिड़ने की नौबत आती है, तब यह नंबर ज्यादा मतलब नहीं रखते, लेकिन जब बड़े भौगोलिक इलाके में लगातार निगरानी रखनी हो तो यह नंबर जरूरी है।

फिलहाल एयर फोर्स के पास हैं 31 फाइटर स्क्वॉड्रन

अभी एयर फोर्स के पास 31 फाइटर स्क्वॉड्रन हैं। एक स्क्वॉड्रन में 16 से लेकर 18 तक एयरक्राफ्ट होते हैं। स्वदेशी फाइटर जेट तेजस के एयर फोर्स में जल्दी शामिल होने से स्क्वॉड्रन की संख्या बढ़ने की उम्मीद है। एयर चीफ चौधरी ने कहा कि लाइट कॉम्बैट एयरक्राफ्ट यानी तेजस का OEOC वर्जन एयर फोर्स के पास है और इसके कुल 16 फाइटर जेट की स्क्वॉड्रन बन गई है। साथ ही इसके FOC वर्जन के भी 14 जेट हैं। बाकी जो एयरक्राफ्ट आने हैं, वह

एयर चीफ वी.आर. चौधरी ने कहा कि 24x7 एयर डिफेंस की निगरानी और पट्रोलिंग के लिए वायुसेना को 42 स्क्वॉड्रन जरूरी हैं।

अगले साल मार्च तक मिलने की उम्मीद है। इसके अलावा 83 और तेजस का कॉन्ट्रैक्ट साइन किया गया था। ये मार्क-1 वर्जन हैं। साथ ही भविष्य में लाइट कॉम्बैट एयरक्राफ्ट का मार्क-2 वर्जन और अडवांस्ड मीडियम कॉम्बैट एयरक्राफ्ट (एम्का) भी लेने हैं। इस बीच, 114 मीडियम रेंज फाइटर एयरक्राफ्ट (MRFA) लेने की प्रकिया चल रही है। हम इस बारे में कंपनियों के प्रस्ताव देख रहे हैं। हम विदेशी कंपनियों से यह भरोसा चाहते हैं कि वह ज्यादा से ज्यादा स्वदेशी चीजें इस्तेमाल करे। एयर फोर्स को उम्मीद है कि अगले दशक के मध्य तक एयरफोर्स के पास 35-36 फाइटर स्क्वॉड्रन होंगी। एयर फोर्स को अपने सुखोई-30 एयरक्राफ्ट अपग्रेड करने हैं। एयर चीफ ने कहा कि इन्हें स्वदेशी हथियारों से ही अपग्रेड करेंगे। हम पहले चरण में 84 एयरक्राफ्ट को अपग्रेड करने की सोच रहे हैं। डिजाइन और डिवेलपमेंट में 4-5 साल लग जाते हैं। उसके बाद असल अपग्रेडेशन शुरू होगा।

THE ASIAN AGE

Sat, 08 Oct 2022

IAF's Big Challenge: Building World-Class Fighters in India

By Abhijit Bhattacharyya

As fighter aircraft are high-tech, high-cost, high-maintenance, high-speed and high-risk operating machines, one must constantly assess the ambience where the Indian Air Force has its operating flight envelope. In flying jargon, it's got to be within and "beyond visual range" (BVR), or even "beyond the horizon" (BTH). Today, where does the IAF, which turns 90 on October 8, stand? How should it move forward?

According to Military Balance 2022, Jane's All the World's Aircraft and Jane's World Air Forces, the IAF has 31 active squadrons of "combat-capable" fighters. There are three Russian-origin squadrons of MiG-29 interceptor/air defence aircraft (inducted 1986); four Anglo-French Jaguar ground attack/strike squadrons (commissioned 1979); six MiG-21 Bison multi-role fighter squadrons (upgraded since 1999); three French-made Mirage-2000 interceptor/air defence squadrons (delivered 1985); 11 Moscow-sourced squadrons of Sukhoi-30 MKI multi-role fighters (joined 2002), two squadrons of the French Rafale DH/EH and two squadrons of the indigenously-produced Tejas multi-role fighter in the IAF fleet. The Tejas and the Rafale are the latest additions.

Understandably, the foreign-origin combat aircraft have always dominated the IAF fleet, despite New Delhi's attempts to make indigenous fighters for over 50 years. Since 100 per cent success is yet to be achieved despite steady progress, India's dependence on West-made fighters is unlikely to change any time soon, as the IAF has to remain prepared to tackle a two-front threat, from China and Pakistan. With large tracts of Indian territory remaining in the illegal occupation of Pakistan's military and China's People's Liberation Army for over six decades, while New Delhi remains helpless in the face of the disinterest and inability of the West-led UN to do anything about it. In fact, the hypocrisy of US and its allies is starkly evident. They are now on an all-out offensive against Moscow over the forced occupation of Crimea and Donbas, but just stood by when Indian territory was similarly occupied. This is why New Delhi has no option but to increasingly build its own fighters as no nation, particularly one of India's size and expanse, can be eternally dependent on the goodwill of foreign manufacturers for the latest, technologically superior fighter jets. The fighter jet situation for India in future will get even more critical. About 15 years ago, there were seven nations manufacturing fighter jets, with India placed eighth, with its Tejas prototype, conceived as a light combat aircraft (LCA) in 1983. Russia, with eight types of fighters, was followed by China (six), the United States (five), France (two) and one each in Japan, Sweden and South Korea. In addition, there was a four-nation consortium building the Euro-fighter Typhoon.

For India, understandably, the stratospheric expenditure to buy fighters was a major financial challenge, forcing it to be a parsimonious pacifist. To produce and operate an indigenous fighter was no longer a matter of choice for New Delhi, but an economic-foreign exchange compulsion. India's chronic bête noire, the CPC-PLA, understood well that it needed to adopt any means for a

home-made fighter, through espionage, theft, cybercrimes, etc, on the West. And it clicked! The result is visible today. Globally, China produces six fighter variants, including a strategic bomber and an Awacs (airborne early warning and control system). Russia's production fell from eight to six variants, while the US maintained the status quo with five. The rest — Sweden, Japan, South Korea, India, France and Italy — have one fighter each in production. Europe's four-nation Euro-fighter continues, but slowly.

In the ruthless marketplace of combat craft, once a fighter attains initial operational capability, it is all trade and commerce, where no one yields an inch on profits. It takes 10-20 years, often longer, to take a fighter from conception to squadron commissioning. The French Rafale took 19 years from design (1982) to service entry (2001). America's multi-role joint strike fighter F-35 Lightning's "request for proposal" (RFP) was issued in December 1995. It's in use with several Western air forces, as well as in Japan and South Korea. Yet, over 25 years after the RFP, the F-35 still has "teething problems". Despite France and America being aviation pioneers, the US' vast resources still keeps it technologically ahead in building fighters.

Given Beijing's unrelenting hostility towards India across the Himalayan highlands, which poses an existential threat to New Delhi, with Chinese garrisons positioned within Indian territory, Indian needs to make the indigenous production of fighter jet is a national mission, not just a mere trading enterprise to earn quick profits. The gestation period for fighter production is long, as can be seen from the French and American examples, and therefore there is no time to be lost. Cash for trade doesn't win aerial combat, industrial production does.

The challenge for India — and in particular for the IAF — is, therefore, as formidable as one can possibly imagine in a world where at least seven nations have marched ahead of New Delhi in manufacturing and marketing fighter aircraft. So, what should be the long-term strategy on strengthening the depleted foreign-origin IAF fleet? To this writer, at least two things must be imbibed from the state that is inimical to India. First, the expertise on reverse engineering on imported aircraft. Second, to boost the power of the indigenous fighter engine for better operational performance in combat. It's because no foreign manufacturer will ever give a buyer like India the latest and the best of its fighter power plants for its own market survival and profit. After all, the combat aviation industry is commerce for cash and is worth billions of dollars.

The dictators who ran the Communist Party of China and its military arm, the People's Liberation Army, were determined from the very beginning to go in for indigenisation of their fighter fleet and for engines which powered the aircraft. Initially, they imported from Russia and Ukraine in bulk quantities and thereafter kept a few machines for exclusive research and development. After gaining experience and expertise in the Moscow-Ukraine machine, Beijing targeted America's tech industry and came down hard through any and every means; most of them illegal. Can New Delhi chalk out an actionable time-bound programme and make a determined bid to indigenise and augment the depleted numbers of its Air Force squadrons, which have been thinned out over the years in which the fleet has not been upgraded? A buyer's force may be a tactical (short-term) success, but can never be durable in the long term as a strategic state asset. It's got to be a builder's fighter.

https://www.asianage.com/amp/opinion/columnists/071022/abhijit-bhattacharyya-iafs-big-challenge-building-world-class-fighters-in-india.html

FINANCIAL EXPRESS
Read to Lead

Sat, 08 Oct 2022

Indian Air Force always Supports Atmanirbharta

Indian Air Force (IAF) has always encouraged the development of indigenous defence production capability. IAF firmly believes that indigenisation reduces our dependence on foreign sources and leads to the economic growth of the nation. IAF always endeavours to achieve self-sufficiency through focussed, sustained and evolved indigenisation programmes. It is one of the key result areas of the IAF.

The Indian Air Force has always played an important role in creating an aerospace ecosystem in India. IAF has been operating indigenously built aircraft and also aircraft built in India under licence production. This has given impetus to indigenous industry in the past. Indigenised inductions and projects

Various Indigenised inductions and projects being supported by the IAF are as follows:-

- Induction of LCA (IOC, FOC, Mk I and Mk 1A) and support to LCA Mk II and AMCA.
- . Induction of Ajeet and HF-24 Marut ac in the past.
- Induction of AEW&C ac and support to indigenous AWACS project.
- Induction of indigenous helicopter ALH and support to LCH.
- Induction of Trainer aircraft (Kiran Mk I and Mk II, HT-2, HPT & HTT-40 aircraft).
- Support for replacement of Avro ac through make in India route.
- Induction and support to several indigenous radars. (Indira, Rohini, Arudhra and Long range surveillance radar)
- Induction of surface-to-air guided weapons like Akash SRSAM system and support to MRSAM and LRSAM projects.
- Integration and operationalization of Astra Air to Air Missile and Brahmos Air to surface missiles.
- Support to weapons projects like New Generation Anti-tank Missile, Smart anti-airfield weapons, new generation anti-radiation missiles and Glide bombs etc.
- Support to CIWS project through the make-in-India route.
- Indigenous production of chaffs and flares, ammunitions and fuses for bombs.
- . Indigenous network solutions like Integrated Air Command & Control System (IACCS), logistics management system (IMMOLS) etc.

Initiatives to Promote Atmanirbharta

As part of the Atmanirbharata campaign, the government has undertaken a number of policy initiatives. Attaining Atmanirbharata in Defence helps in Atmanirbharata in many other fields as

most of the technologies that are being developed are dual-use technologies. The initiative has gathered momentum and today the Indian aerospace industry is one of the fastest growing industries, with the participation of a number of private players. IAF fully supports these initiatives and is committed to this cause. It is and is working towards the achievement of the desired end result of full self-reliance along with other stakeholders. Some of the initiatives are as follows:-

Directorate of Aerospace Design

IAF has created the Directorate of Aerospace Design, with the aim to synergize efforts for 'Make in India' and greater involvement of IAF in innovation, design and development. The role of Dte of Aerospace Design is to identify niche technologies that are attainable by Indian Industry and facilitate their development for inducting into IAF to enhance the operational capabilities. The Dte works closely with DRDO, DPSUs, CSIR labs, academia, private industries, start-ups, and individual innovators, to identify possible systems and technologies for IAF use.

Directorate of Indigenisation

IAF also has a directorate of Indigenisation under the Maintenance branch, to encourage the indigenisation of spares and system parts. Over the years, IAF, Base Repair Depots have indigenised about 63,000 lines of spares for field and Depot level maintenance requirements. This initiative is now being propelled to a higher level to galvanise the Indian Industry for repair, overhaul and manufacture for IAF fleet sustenance.

Effective Utilisation of Innovation for Defence Excellence (iDEX)

IAF actively participates in the iDEX initiative and utilises it effectively to increase the level of self-reliance. iDEX is the operational framework of the Defence Innovation Organization (DIO), a special purpose vehicle under the aegis of the Department of Defence Production, Ministry of Defence, to support innovation for Indian Defence, and to create pathways for the adoption of technologies in the Indian armed services, as well as seeding India's future Defence enterprises. The iDEX scheme aims to create an ecosystem to foster innovation and technology development in Defence and Aerospace sectors by engaging industries including MSMEs, start-ups, Individual Innovators, R&D Institutes, and academia. IAF uses the platform to Co-ideate and Co-innovate along with start-ups/ MSMEs to seek innovative & indigenous solutions. Various iDEX projects for IAF are at various stages of development and the case for procurement of certain products developed under iDEX is already in progress.

Utilisation of Technology Development Fund (TDF) Scheme

The government of India has set up a Technology Development Fund (TDF) to provide grants for the development of technologies that will form the kernel of components/assemblies, which will in turn be used to develop defence equipment. The fund is managed by DRDO. IAF has fielded a number of projects under this scheme and contracts for many cases have been awarded to Indian Industry.

Contribution to the indigenisation List

In pursuance of India's endeavour for self-reliance, the Ministry of Defence has promulgated an indigenisation List. This list spells out the various-weapons systems *I* platforms/ / equipment along with indicative timelines which will be procured from 'Indian Vendors' only. IAF is a large contributor to the list both by volume and value.

Efforts to Promote Atmanirbharta

Some of the efforts to promote Atmanirbharta are as follows:-

Industry Outreach Programme

IAF reaches out to all the aviation industry stakeholders through Interaction at a one-to-one level, organised seminars, participation in expositions and professional association through MoU. Further, the IAF uses digital platforms like the IAF website and Srijan defence Web Portal of MoD, to promulgate the emerging requirement for IAF. This widely publicised and transparent list provides greater business opportunities for the Indian Industry for participation in endeavour for "Make in India".

Nodal Technology Centers

The resolve for total self-reliance by IAF needs a professional ecosystem of specialists viz. Academicians, Industry and R&D agencies. Further, the certification of aviation products for airworthiness is very stringent. Towards this goal, IAF has adopted a Nodal Technology Centres (NTCs) structure at Base Repair Depots (BRDs) to coordinate, facilitate and steer the development process.

Spares Manufacturing in India

Transfer of Technology and licence production is enablers to assimilate emerging technology. This approach has paid rich dividends in the past. A joint venture with foreign OEM for manufacture of spares and parts would benefit the cause of Atmanirbharta. For example, an Inter-Governmental Agreement between India and Russia has already been signed for enabling manufacture of Russian Origin Spares in India. More than 100 items have been identified for manufacturing in India, and manufacturing facilities have already been set up. These lists are going to grow in future. Similar agreements with other OEMs are being explored.

3D Manufacturing

IAF has taken the lead in the manufacturing of aviation spares through 3D printing. About 300 items have already been printed and are in use in the IAF. This list is likely to grow exponentially in future. Further, IAF has taken the lead in involving Certification & Regulatory bodies, DRDO & CSIR Labs, Industries DPSUs as well as academia from various IITs and IISc for the development of Technology, new materials and designs for 3D printing.

Some of the other efforts include:-

- Upgrades through indigenous routes. Mig-29 upgrade by Base Repair Depot, Jaguar and M-2000 upgrade by HAL, AN-32 upgrade and Digitisation of Pechora SAM system.
- Identification of MSMEs for MRO (Maintenance, Repair and Overhaul) of military aviation equipment.
- Support to Aeronautical Development Agency and National Flight Test Centre.

Way Ahead

Government Initiatives

The government has taken lots of initiatives under different verticals to promote self-reliance. The list of these Initiates is attached (at the end of the document).

The way forward: Focus areas

Suggestions to further promotion of atmanirbharta are attached (at the end of the document).

Conclusion

Self-reliance boosts national security and is a major cornerstone on which the military capability of any nation rests. Indigenous defence production is an essential capability to provide strategic independence to a nation. Self-reliance not only reduces import dependence but is also essential for the economic growth of the country and employment generation.

IAF has been fully committed to supporting Atmanirbharta earnestly and will continue to do so in the future as well. IAF often gets accused of not supporting indigenisation with remarks like "*Air Marshals always want to play with foreign toys'* **'.** This is far from the truth. The important thing to remember is that while supporting self-reliance the minimum level of deterrence capability needs to be maintained at all times

Initiatives To Promote Atmanirbharta

The government has taken lots of initiatives under different verticals to promote self-reliance. The list of these Initiates is as follows:-

- **Licensing relaxation**. Measures include simplified defence industrial licensing, relaxation of export controls and grant of no-objection certificates.
- **Specific incentives** have been introduced under the foreign trade policy and the Ministry of External Affairs has facilitated Lines of Credit for countries to import defence products.

Indigenization lists

To boost indigenous manufacturing, the Government has issued "positive indigenization lists" consisting of items that cannot be imported.

- **Budgetary allocation**
- A percentage of the capital outlay of the defence budget has been reserved for procurement from domestic industry.
- Opening the defence R&D beyond the DRDO, and reserving a percentage of the defence R&D budget for the local industry, start-ups and academia.
- Corporatisation of the Ordnance Factory Board, converting it into seven defence PSUs.
- Launch of a new edition of the Innovation for Defence Excellence (iDEX) initiative. iDEX Prime is a key initiative to promote innovators and start-ups. Under this, the defence ministry, armed forces, coast guard and defence PSUs share problem statements with the industry, in search of solutions. Projects selected under this are funded by the government.
- Allowing over 130 test labs and 25 proof ranges to be used by the industry.
- Creation of an "independent nodal umbrella body" to deal with the testing and certification needs of the domestic industry, bringing all the trial, testing and certification agencies under one administrative agency.

Defence Production and Export Promotion Policy (DPEPP)

The Defence Ministry has also issued a Defence Production & Export Promotion Policy. The policy lays out the following goals and objectives:

- To reduce dependence on imports and take forward "Make in India" initiatives through domestic design and development.
- To create an environment that encourages R&D rewards innovation creates Indian IP ownership and promotes a robust and self-reliant defence industry.
- To develop a dynamic, robust and competitive Defence industry, including the Aerospace and Naval Shipbuilding industry to cater to the needs of the Armed forces with quality products.
- To promote the export of defence products and become part of the global defence value chains.
- To achieve a turnover of Rs 1,75,000 Crore (US$ 25Bn) including export of Rs 35,000 Crore (US$ 5 Billion) in Aerospace and Defence goods and services by 2025.

Atmanirbharta The Way Forward: Focus Areas

- The development of a thriving indigenous defence industry needs an overhaul of existing regulations and practices.
- A long-term integrated perspective plan of the requirements of the armed forces should give the industry a clear picture of future requirements.
- DPP should incorporate guidelines to promote forward-looking strategic partnerships between Indian and foreign companies.
- The IPR (Intellectual Property Rights) is a key ingredient of an ecosystem which stimulates innovation and ingenuity. It needs to be exploited to its full potential.
- 100% FDI in the defence sector would give private players an opportunity, bringing in the money as well as competition to the Defence PSUs.
- Setting up more defence industrial corridors.
- Setting up of a Defence Export Organisation to promote the export of defence equipment.
- Instituting an Independent Audit addressing issues of inefficiency and accountability.
- A scientific system to assess the extent/ level of indigenisation achieved by defence production entities in the country.
- Better monitoring of Defence offset policies, removing unnecessary restrictions and encouraging linking of defence offsets even in the civil sector.
- Encourage private players to enter the defence sector by reserving some percentage of the defence R&D budget for industry-led projects.
- Creation of an even playing field should be created between the Defence Public Sector Undertakings (DPSUs) and the private sector companies.

- Revival and revitalisation of Indian defence PSUs and ordnance factories to make them more dynamic.
- Establishing courses on defence production across universities and creating job opportunities for the graduates.

https://www.financialexpress.com/defence/indian-air-force-always-supports-atmanirbharta/2704297/lite/?utm_source=defence_landing_page&utm_medium=article_listing_widget&utm_campaign=Tags

mint

Fri, 07 Oct 2022

Indigenisation of 72 Items by Defence Public Sector Undertakings before their Original Timelines

Putting Atmanirbhar Bharat on fast track, 72 items out of total of 214 items mentioned in 1st and 2nd Positive Indiginisation List (PIL) have been indigenised by Defence Public Sector Undertakings (DPSUs) well before their original indigenisation timelines of December 2023, December 2024 and December 2025, the Ministry of Defence said in a statement. The remaining 142 items are being indigenised within the timeline of December 2022, it said. Some of the main Sub-systems/ Line Replacement Units (LRUs) indigenised include Magazine Fire Fighting System for Ships, Steering Gear System and Fin Stabilisers with Control for Frigates, Pressurised containers for Akash Missiles, KOE charge for Konkurs Missiles and Electric Motor, Decontamination set and Prism optical instrument for Battle Tanks, the ministry said.

Beside these items, some critical components include intermediate castings for Helicopter, Polychropene Rubber Band for Submarines and High Pressure Regulating Valves for Ships. Details of all the indigenised items are available on "SRIJAN Portal (srijandefence.gov.in)". It is notable that in pursuit of self-reliance in defence manufacturing and to minimise imports by DPSUs under 'Atmanirbhar Bharat Abhiyan', Department of Defence Production (DDP), Ministry of Defence had notified three Positive lndigenisation Lists of LRUs/ Sub-systems/ Assemblies/ Sub assemblies/ Components in December 2021, March 2022 and August 2022 respectively with an indicative timeline for their indigenisation.

The 1st PIL contains 351 items, 2nd PIL has 107 items and 3rd PIL has 780 items for indigenisation. Subsequently, DDP has notified the revised timeline of the 72 indigenised items (PIL-1: 67 & PIL-2: 5). Now, these items will be procured only from the Indian Industry thereby giving a boost to the domestic industry including MSMEs and will save foreign exchange, the ministry said. This also reinforces the growing confidence of the government in the capabilities of domestic industry for supplying items of international standards to meet the demand of the Armed Forces.

https://www.livemint.com/news/india/indigenisation-of-72-items-by-defence-public-sector-undertakings-before-their-original-timelines/amp-11665151333880.html

The Indian EXPRESS

Sat, 08 Oct 2022

Aatmanirbhar in Defence Production: Where India Stands Among Indo-Pacific Nations

India ranks fourth among 12 Indo-Pacific nations in self-reliant arms production capabilities, according to a study released this month by the Stockholm International Peace Research Institute (SIPRI), a widely respected independent resource on global security. China tops the list, Japan is second, South Korea is in third place, and Pakistan is at number 8.The study**,** which measures self-reliance until 2020, is based on three indicators of self reliance in each country:

- **Arms procurement** — imports, licensed and domestic production as a proportion of the government's total procurement of major conventional arms;
- **Arms industry** — the study presents the five largest arms companies in each country, where data are available, ranked by sales of arms and military services in 2020 to both domestic and export customers;
- Uncrewed maritime vehicles, the sea equivalent of drones — covering both uncrewed surface vehicles (USVs) and uncrewed underwater vehicles (UUVs), meant to provide a qualitative understanding of how countries are engaging domestic research institutes and firms to produce such cutting edge systems.The study's choice of maritime domain was because the Indo-Pacific region is a "maritime theatre", and most of its flashpoints involve navies. The 12 countries in the study were selected because they have the highest military spending in the region — Australia, China, India, Indonesia, Japan, South Korea, Malaysia, Pakistan, Singapore, Taiwan, Thailand and Vietnam.

According to the study, understanding and determining the extent of self-reliance in the Indo-Pacific region, which has several ongoing flashpoints, is crucial for trust and confidence-building among states. This region has also seen a growing allocation by states for defence procurement. Eighteen arms manufacturing companies based in the region were ranked among the world's largest arms companies in 2020.In a region where tensions among neighbours are rising, this report contributes to transparency with regards to levels of self-reliance in domestic arms production, allowing for an independent assessment of the region's respective arms industries," the study says.China was the world's fifth largest arms importer in 2016-20. Its self-reliance policies, and its high economic growth in that period meant that the Chinese arms industry now increasingly fulfills the requirements of the People's Liberation Army (PLA). Its high volume of imports in absolute terms accounts for only 8 per cent of total procurement for the period, the lowest share for any of the 12 governments studied in this report.

China's arms industry primarily involves nine large state-owned enterprises (SOEs). All eight companies for which data are available are in the top 100, with four in the top 10 in 2020. Four are dominant in the aerospace and aviation sectors, two in land systems, one in electronics, one in shipbuilding, and one in nuclear power.The PLA is the main customer for the arms companies. China also has 17 ongoing projects, in collaboration with universities and other agencies to develop "long-range precision, intelligent, stealthy or unmanned weaponry and equipment".India is ranked as the second largest importer of arms for its armed forces in 2016-20. India is highly

dependent on imports of complete foreign major arms, including many produced under licence or as components for its domestic production.

ARMS EXPORTS & IMPORTS; MILITARY SPENDING IN INDO-PACIFIC REGION

Country	Exporter rank*	Importer rank*	Largest supplier**	Military Spending 2021***	Spending rank****
Australia	3	2	US (69%)	31,754	5
China	1	3	Russia (77%)	293,352	1
India	4	1	Russia (54%)	76,598	2
Indonesia	5	8	US (23%)	8,259	9
Japan	14	6	US (97%)	54,124	3
South Korea	2	4	US (58%)	50,227	4
Malaysia	NA	16	Spain (32%)	3,830	13
Pakistan	13	5	China (72%)	11,305	8
Singapore	7	9	France (43%)	11,115	7
Taiwan	12	15	US (100%)	12,958	6
Thailand	15	10	South Korea (25%)	6,605	10
Vietnam	11	7	Russia (66%)	5,500*****	NA

Of India's total volume of procurement in 2016–20, 84 per cent was of foreign origin. Domestic arms companies provide only 16 per cent of its total procurement. According to the study, the significant arms sales of local firms and the high level of licensed production push India to fourth position in the list.Hindustan Aeronautics Ltd, Indian Ordnance Factories, Bharat Electronics, Mazagaon Docks and Cochin Shipyard are among the major Indian arms servicing companies. Ashok Leyland, one of the largest suppliers of trucks to the Indian Army, is the only company ranked in the top 50 in the Indo-Pacific.India has seven Uncrewed Maritime Vessel projects ongoing. In the private sector, Larsen & Toubro has been developing AUV prototypes on its own and in collaboration with foreign partners, such as Italy's EdgeLab, while DRDO and the Central Mechanical Engineering Research Institute have been considering development of AUV prototypes.

https://indianexpress.com/article/explained/india-defence-production-exports-imports-capabilities-explained-8196801/

Sun, 09 Oct 2022

China More Self-Reliant in Defence Production, Outranks India by Massive Margin, Says Study

China has been placed first in self-reliant defence production, while India has been ranked fourth among 12 countries in the Indo-Pacific, according to a study of the Stockholm International Peace Research Institute (SIPRI), an independent research institute on global security. Japan is second, South Korea is in third place, and Pakistan is at eighth place, according to the study, which measures self-reliance until 2020. "China dominates the ranking, reaching a self-reliance score more than two and a half times higher than Japan's," the study said.

The ranking was published after assessing the defence production of 12 countries, they are: Australia, China, India, Indonesia, Japan, South Korea, Malaysia, Pakistan, Singapore, Taiwan, Thailand and Vietnam. They did not include Vietnam in the final ranking due to lack of data.

The study is based on three indicators.

- Arms procurement: Imports, licensed and domestic production as a proportion of the government's total procurement of major conventional arms
- Arms industry: The research highlights the five largest arms companies in each country where data is available, and ranks them by sales of arms and military services in 2020 to both domestic and export customers
- Uncrewed maritime vehicles, the sea equivalent of drones: covering both uncrewed surface vehicles (USVs) and uncrewed underwater vehicles (UUVs), meant to provide a qualitative understanding of how countries are engaging domestic research institutes and firms to produce such cutting-edge systems.

The research argues that despite trying to cut imports, India continues to remain dependent on foreign nations for arms needs. From 2016 to 20, it ranked as the second largest importer. "India's domestic arms companies provide only 16 per cent of its total procurement. However, the significant arms sales of local firms and the high level of licensed production push India to fourth position in the list. This should be put in perspective against the fact that India is the second largest military spender in the region, after China." SIPRI deliberately chose Indo-Pacific as it sees the region as a "maritime theatre", saying that most of its flashpoints involve navies.

https://www.wionews.com/india-news/in-self-reliant-defence-production-china-outranks-india-by-massive-margin-says-study-523753

INDIA TODAY

Sat, 08 Oct 2022

China Way Ahead of Others, India 4th Ranked in Indo-Pacific, Says Study

India stands at fourth position among 12 countries of the Indo-Pacific in self-reliant defence production, says a study by the Stockholm International Peace Research Institute (SIPRI) that assessed self-reliance in arms production. China dominated the list leaving others behind by a long margin. "China dominates the ranking, reaching a self-reliance score more than two and a half times higher than Japans," the study by Stockholm International Peace Research Institute (SIPRI), a think tank on global security issues says. The study covered Australia, China, India, Indonesia, Japan, South Korea, Malaysia, Pakistan, Singapore, Taiwan, Thailand and Vietnam. Vietnam could not be included in the final ranking due to a lack of data. Despite the long-term efforts, India remains one of the largest importers of major arms globally. For the period 201620, it ranked as the second largest importer, the study says.

"Indias domestic arms companies provide only 16 per cent of its total procurement. However, the significant arms sales of local firms and the high level of licensed production push India to fourth position in the list. This should be to put in perspective against the fact that India is the second largest military spender in the region, after China." The study says India is highly dependent on imports of complete foreign major arms, including many produced under licence or as components for its domestic production. "Of Indias total volume of procurement in 201620, 84 per cent was of foreign origin."

According to the study, China remained the worlds fifth largest arms importer in 201620 but the implementation of the self-reliance and militarycivil fusion policies, combined with Chinas fast-paced economic growth, mean that the Chinese arms industry increasingly fulfils the requirements of the armed forces, the Peoples Liberation Army (PLA).

"Hence, while the volume of imports was still high in absolute terms, it accounted for only 8 per cent of total procurement for the period. This is the lowest share for any of the 12 governments studied in this report." The report points out that delivery of combat aircraft and air-defence systems from Russia were an important part of the Chinese imports, but these were all delivered by the end of 2019, and no new orders have since been announced. "Domestic production accounted for 92 per cent of total procurement. This share is likely to be an underestimate as data on Chinese procurements from domestic production is often unreliable or incomplete and estimates made for this report are conservatively low. Domestic production covers all categories of major arms, including almost all key components, and it includes the high end of technology (e.g. China is one of only two states that has a fifth-generation combat aircraft in serial production, and it is a pioneer in armed UAVs)"

According to the study, domestic production in China is replacing many critical imports. "For instance, the latest versions of the J-10, J-11 and J-20 combat aircraft and the Y-20 transport aircraft, which started to be delivered in 2019 and 2020, use Chinese-designed engines instead of

the imported Russian engines used in earlier versions." After China, Japan and South Korea, India is ranked fourth. Taiwan, Australia and Singapore rank fifth, sixth and seventh. Pakistan is ranked eighth, followed by Indonesia (rank 9), Malaysia (rank 10) and Thailand (rank 11).

https://www.indiatoday.in/india/story/defence-self-reliance-china-way-ahead-of-others-india-4th-ranked-in-indo-pacific-2282780-2022-10-08

FINANCIAL EXPRESS
Read to Lead

Sat, 08 Oct 2022

Rolls Royce in Talks with DRDO to REV up AMCA Engines

On Friday a team from Defence Research and Development Organisation (DRDO) met with the UK-based Rolls Royce to discuss the Advanced Medium Combat Aircraft (AMCA) Engine.

DRDO-Rolls-Royce JV

Under this joint venture the Intellectual Property Right (IPR) will be retained by India for High Thrust Low bypass engine (110kn+). According to the tweets from the High Commission of India in London, the Indian High Commissioner to the United Kingdom, Dr Vikram Doraiswamy, and the Director General of the DRDO, Ms Chandrika Kaushik, were in attendance during a presentation held at the Rolls Royce plant. And the images in the tweets indicate that the presentation was about AMCA Engine, as indicated by one of the posters. The picture displays the words progressing, collaboration and jet engine core.

In 2021, Rolls-Royce in India said it is interested in collaborating with India to co-develop and produce engines for India's AMCA fifth-generation fighter aircraft project. It has been reported in Financial Express Online that in 2017 both India and the UK had agreed to cooperate in the development of advanced defence projects and this also included the gas turbine engine and air defence missile systems. And, as reported in Financial Express Online, there is a collaborative project Defence Research and Development Organisation and the British engine maker Rolls Royce on jet engine technology. According to reports Kishore Jayaraman, president of Rolls-Royce India and South Asia, has said that if a partnership is formed, the Indian government will hold the Intellectual Property (IP) rights for the engines. India will need IP to tweak and improve its engines in the future. In addition, IP ensures that engines may be sold to other parties and that the United Kingdom has no veto power over India in the case of geopolitical concerns.

According to company officials, Rolls-Royce feels it can be an effective partner for AMCA's engine manufacturing in India. This area represents the future – to co-develop, co-manufacture, and co-create. And it is consistent with India's indigenous design and manufacturing drive and the Atmanirbhar way. Rolls Royce, according to Jayaraman, is devoted to the co-creation philosophy because, ultimately, when organisations co-create, they build intellectual property, and the IP is developed locally. When a product is designed and manufactured in India, it may

develop its supply chain and services model. According to him, this creates a new atmosphere for the Indian aviation sector.

Competition with Safran and GE

India is in talks with Rolls-Royce, French company Safran, which powers the Rafale fighter, and American company GE, which powers the Light Combat Aircraft 'Tejas, over a prospective agreement to manufacture a jet engine in India. While Rolls-Royce and Safran are the primary competitors, Safran has not yet fulfilled the requirements for Rafale fighter engines. The offset requirement of the Rafale deal includes the aircraft engine technology transfer. The plan addressed the transfer of expertise for developing an indigenous LCA engine; however, Safran has not yet fulfilled it. Rolls Royce has offered a Eurojet EJ200 version with 110-120KN thrust. The SAFRAN-DRDO joint venture is planned with complete ToT and is based on the M88 engine base type. On the other hand the United States' interest in the fighter engine programme has lately been rekindled. Due to American reluctance to share core or hot engine technology, the India-US Defense Trade and Technology Initiative (DTTI) collaboration on jet engine technology was postponed in October 2019. Within the DTTI framework, a joint working group on jet engine technology was subsequently disbanded. However, in the first development phase of the AMCA project, a commercially available GE-414 engine will be purchased and installed.

Russia is the only other noteworthy engine manufacturer, "but their engines are inefficient, and Rosoboronexport overcharges at every stage," says a senior officer who wished to remain anonymous. There is no agreement yet in place between DRDO and RR, since the NGFA 110kn+ is not expected to begin development until 2030. Depending on the final cost of the engine project, a joint IP is also considered in addition to an Indian-only IP.

The need for engine IP

Explaining the necessity of an IP for the engine, Girish Linganna, Aerospace & Defence Analyst tells Financial Express Online "The engine intellectual property is a crucial component of the Indian engine development strategy since the engine may be modified to meet the LCA Mk1/1A re-engines needs and the LCA Mk2/Twin Engine Deck Based Fighter (TBDEF) requirements." "Approximately 250 GE-404 84KN engines are required to power the LCA Mk1/1A. India has ordered only half of the requirement from GE. The IP will enable India to scale up the Kaveri engine to meet the requirements of the LCA Mk1/1A and the future development of LCA MK2 / TBDEF, which would initially employ the GE-414 engine with a 98KN thrust rating. The GE-414's other two opponents are the Rolls Royce EJ 200 engine and the Safran M-88 – 4 engine," Girish Linganna adds. These requirements were to be met by Safran's engine obligations; however, as stated earlier before, the commitments have not been met.

https://www.financialexpress.com/defence/rolls-royce-in-talks-with-drdo-to-rev-up-amca-engines/2704355/lite/?utm_source=defence_landing_page&utm_medium=article_listing_widget&utm_campaign=Tags

THE NEW INDIAN EXPRESS

Sun, 09 Oct 2022

NSG to Make Maiden Ops Recce of ITR amidst Growing Threat

Amid growing security threat on vital installations, the National Security Guard (NSG) will conduct the first operational reconnaissance of the Integrated Test Range (ITR) from where DRDO conducts flight tests of indigenous missile systems. Sources said a team of 29 Special Composite Group of NSG will undertake operational reconnaissance to check preparedness of the defence unit to thwart possible terror attacks.ITR, an important laboratory of DRDO, is vulnerable to attacks by terrorist outfits and warnings from the Intelligence Bureau (IB) in regular intervals have sprung more worries for security agencies responsible for safeguarding life and property.

The threat on the defence establishment is growing as five staff of ITR including a driver of the Director were arrested on espionage charges for allegedly leaking information to Pakistani agents last year. Every year, police picks up unknown people while roaming the prohibited areas of the establishment. Intelligence sources said Odisha, along with West Bengal and Manipur, could emerge as a haven for several terror outfits as 'jihadi' elements mingle with illegal Bangladeshi migrants and function as 'sleeper cells'.

The alarm bell has started ringing as the sea route could be used for attack on major establishments. The poorly equipped marine police stations escalate the threat perception.Sources said, Group Commander Munish Thakur has urged IG (Operation) to instruct authorities concerned including the Collector and SP for facilitating reconnaissance scheduled to be undertaken on October 20 and 21. Apart from ITR, the Proof and Experimental Establishment (PXE), another unit of DRDO at Chandipur in Balasore district, the naval centre at Chilika and the army and air defence college at Gopalpur in Ganjam district are the vital installations in the State under constant threat.

The State has nearly 114-km defence safety zone and about 630 fishing villages along the coast. The Bangladeshi migrants have their presence in most of these villages.The defence establishments at Chandipur are ringed by two tiers of security forces - one by Defence Security Forces (DSF) and another by the State police. Several platoons Defence Security Core (DSC) have been deployed in the ITR and PXE.

https://www.newindianexpress.com/states/odisha/2022/oct/09/nsg-to-make-maiden-ops-recce-of-itr-amidst-growing-threat-2506287.html#:~:text

The Tribune

Mon, 10 Oct 2022

New CDS must Ensure Inter-Service Synergy

By C Uday Bhaskar

Assuming charge as the country's second Chief of Defence Staff (CDS), Lt Gen Anil Chauhan (retd) assured his fauji brethren: "I will try to fulfil the expectations from the three defence forces as the CDS. We will tackle all challenges and difficulties together."This statement acquires greater salience on Air Force Day today since nurturing 'jointness' or higher levels of inter-service synergy was a major objective when the post of the CDS was announced by Prime Minister NarendraModi in August 2019.Given the many national security challenges that need to be addressed, some immediate ones such as the Ladakh standoff and others that are complex, Gen Chauhan will have a wide spectrum 'must-do' list. This will not only seek to take forward the work in progress initiated by his predecessor, General BipinRawat (whose tenure was tragically cut short in a helicopter crash in December last), but also factor in the multi-dimensional turbulence engendered by the war in Ukraine that began in February.

The CDS has an anomalous institutional profile; in that he is the first among equals along with the three service chiefs as a four-star General. Concurrently, he is Secretary to the Government of India in the Ministry of Defence and Principal Adviser to the Defence Minster on inter-service issues. This is a daunting combination of roles and each hat has its own distinctive challenge for the new incumbent.Chauhan retired as a three-star Army General and his last appointment was that of an Army commander, Eastern Command in Kolkata.In an unprecedented move, the government has recalled and re-commissioned a retired officer in a higher rank with much greater civil-military responsibilities. A four-star service chief has a higher defence management exposure that is very different from that of an Army GOC-in-C (and equivalent) and the new CDS will be expected to provide the 'firm hand on the tiller' as the Chairman of the Chiefs of Staff Committee, without the benefit of having been a chief. While Gen Chauhan's professional acumen is commendable, the enormity of what he has been tasked to shoulder is to be noted.

Presumably, an objective review of Gen Rawat's experience must have been undertaken by Gen Chauhan when he was serving as a military adviser to the National Security Adviser (NSA). However, some issues related to the office of the CDS that attracted comment during the Rawat tenure merit recall and an objective in-house review by the new incumbent may have a bearing on the evolution of this high office with its onerous responsibilities.The first is related to ceremonial matters. It may be recalled that Gen Rawat assumed office as the CDS in January 2020 in the same rank that he held as the Army Chief — namely that of a four-star General. However, Rawat assumed office with a newly designed rank badge that was incongruous and raised eyebrows — for the CDS was not envisaged as a rank, but a post.

The grapevine has it that this new rank badge was mooted by Gen Rawat when he was the Army Chief and his name was announced as the first CDS. At the time, his peers did not agree to this proposal for it would not have been possible for an Admiral or an Air Chief Marshal to wear such a badge! Some retired senior Army officers had also conveyed their unease with this 'new

badge' to Gen Rawat, but the horse had bolted and this sagacious counsel was not taken.Gen Chauhan must have been aware of the flutter that the rank-badge issue had caused and the import of such symbolism in the military. This is a purely military ceremonial matter and the CDS could decide how best to arrive at appropriate in-house closure.

The more substantive strand from Gen Rawat's tenure is the dismay created when he made an off-the-cuff remark about the Air Force and some less than positive observations about the Navy. This went against the ethos of the inter-service synergy that the CDS was expected to usher in and Gen Chauhan will have to address this matter with empathetic persuasiveness.More recently, Air Chief ACM Vivek Ram Chaudhari expressed his nuanced 'reservations' about doctrine and structures while pursuing theatre commands when there is a paucity of air assets.The last, but perhaps most, substantive strand is the 'lakshmanrekha' that the new CDS will have to draw in relation to the military-political overlap.

Eyebrows had been raised when Gen Rawat chose not to attend the Navy Day event in December 2020 and instead participated in a programme with 'overt religious overtones' in the company of UP Chief Minister Yogi Adityanath.The fact that Gen Chauhan was handpicked by the Modi government as the CDS and that the existing rules were tweaked to enable this appointment have attracted notice. While it is the prerogative of the government to choose its military top brass, the CDS is his own 'sherpa' in such sensitive matters and will have to evolve the appropriate template of rectitude and restraint to insulate the military from the prevailing socio-political churn that India is experiencing.

Whereas caste and religion have become central to the Indian politics, to its credit, the armed forces have not allowed these determinants to impact military professionalism and commitment to core democratic principles.When Gen Rawat assumed office, former Naval Chief Admiral ArunPrakash had sagaciously advised, "The military ethos requires that he (CDS) retains his professional independence and upholds his oath of allegiance to the Constitution." This principle is cast in stone and should remain inviolate.

https://www.tribuneindia.com/news/comment/new-cds-must-ensure-inter-service-synergy-439109

THE HINDU BusinessLine

Sat, 08 Oct 2022

Maiden Sea Sortie Warship INS Vikrant Departs from Dock for Maiden Operational Trials

More than a month after being commissioned into the Indian Navy, aircraft carrier INS Vikrant left the Cochin Shipyard dock on Friday for a maiden sea sortie. The first indigenously developed and built 43,000-tonne aircraft carrier is to commence the first of a series of operational level trials, said Navy sources. Cochin Shipyard Ltd Director (Operations), Sreejith KN, confirmed to *businessline* that INS Vikrant had departed for routine trials. "Now the vessel is with the Navy, they are better placed to talk about it, but the INS Vikrant has moved into a

routine sortie for the first time since commissioning and is expected to return around November 21," he said. The warship is supposed to undergo deck integration trials of fixed wing aircraft that would also involve use of the Aviation Facility Complex (AFC). In a pre-commissioning interaction with media on August 24, the Navy's Vice-Chief of Staff, Vice-Admiral S.N. Ghormade, said the warship would become battle worthy by the middle of next year. The MiG-29k fighter landing trials would roll out in November. The aviation facility system has been sourced from the Russia, sources in the Navy said. The warship will have a fleet of 30 aircrafts -- 18 Mig 29s and a dozen Russian-made Kamov and newly inducted MH60 Romeo helicopters bought from the US. They will be weaponised with anti-submarine capabilities. The aircraft carrier, also equipped with surface-to-air missiles, has a maximum speed of 28 knots, with an endurance of 7,500 nautical miles, and can accommodate 16,000 men and women officers and sailors in specialised cabins.

Commissioned into the Indian Navy in September, INS Vikrant offers strategic depth and a dominating presence in the Indian Ocean region. India joints an elite club of countries -- the US, China, the UK, Russia, France, and Italy -- that have developed individual capabilities to design and build an aircraft carrier.

Anti-narcotics operation

In a coordinated operation at sea, the Narcotics Control Bureau (NCB) and the Indian Navy apprehended a suspicious vessel carrying more than 200 kg of narcotics. The boat and its crew has been escorted to Kochi for further investigation, said the Navy. "This is significant not only in terms of quantity and cost, but also collaborative efforts for disruption of illegal narcotics smuggling routes, which emanate from the the Makran coast and flow towards IOR countries. Apart from the human cost of drug addiction, the spoils of the narcotics trade feeds syndicates involved in terrorism, radicalisation and criminal activities," the Navy said in a statement.

https://www.thehindubusinessline.com/news/warship-ins-vikrant-departs-from-dock-for-maiden-operational-trials/article65981822.ece/amp/

THE ECONOMIC TIMES

Sat, 08 Oct 2022

Missile Launches Legitimate Defence Against US Military Threats: North Korea

North Korea on Saturday defended its recent flurry of missile tests as a legitimate counter to US military threats. The reclusive communist country has conducted six sanctions-busting launches in less than two weeks, the latest coming Thursday with the firing of a pair of ballistic missiles. On Tuesday, it fired an intermediate-range ballistic missile over Japan, prompting an alert for people in affected areas underneath to take cover. "The missile test launch by the DPRK is a regular and planned self-defensive step for defending the country's security and the regional peace from the US direct military threats that have lasted for more than half a century," North Korea's civil aviation agency said, without specifying which launch, according to state-run news agency KCNA. The government agency issued the statement after the International Civil

Aviation Organization, holding its annual assembly in Montreal, on Friday condemned North Korea's missile tests of recent months and called them a danger to civil aviation.

The Korean agency said the ICAO's resolution was "a political provocation of the US and its vassal forces aimed to infringe upon the sovereignty of the DPRK" -- the initials of North Korea's official name. Seoul, Tokyo and Washington have ramped up joint military drills in recent weeks, and carried out more exercises Thursday involving a US Navy destroyer from the USS Ronald Reagan aircraft carrier's strike group. The launches are part of a record year of weapons tests by isolated North Korea, which leader Kim Jong Un has declared an "irreversible" nuclear power, effectively ending the possibility of denuclearisation talks. The United States on Friday imposed sanctions on firms and individuals in Asia accused of helping Pyongyang procure fuel in violation of UN sanctions. Washington also held a trilateral call with Tokyo and Seoul and the three agreed they would "continue to closely coordinate their near- and longer-term responses, including with allies and UN partners", the US State Department said in a statement.

Pyongyang's latest missile launches "pose a grave threat to regional peace and security", it said. North Korea on Saturday released a separate statement, saying it was "seriously approaching the extremely worrisome development of the present situation", referring to the nuclear-powered USS Ronald Reagan being part of the US-South Korea military drills this week. The joint exercises by Seoul and Washington have always infuriated the North as Pyongyang considers them rehearsals for invasion. The drills are "extremely provocative and threatening", KCNA said Saturday, and the recent involvement of the USS Ronald Reagan is "a sort of military bluffing" against Pyongyang's "righteous reaction" to protect itself from US threats, it added. Analysts say Pyongyang has seized the opportunity of stalemate at the United Nations to conduct ever more provocative weapons tests. Officials in Seoul and Washington have been warning for months that Pyongyang will also conduct another nuclear test, likely after China's Communist Party Congress later this month.

https://economictimes.indiatimes.com/news/defence/missile-launches-legitimate-defence-against-us-military-threats-north-korea/articleshow/94718556.cms?from=mdr

Science & Technology News

The Indian EXPRESS

Sat, 08 Oct 2022

Chandrayaan-2 Spectrometer Maps Abundance of Sodium on Moon for First Time

The X-ray spectrometer 'CLASS' on the Chandrayaan-2 Orbiter has mapped an abundance of sodium on the moon for the first time, according to the Indian Space Research Organisation

(ISRO). Chandrayaan-1 X-ray Fluorescence Spectrometer (C1XS) detected sodium from its characteristic line in X-rays which opened up the possibility of mapping the amount of sodium on the Moon, it said.

In a recent work published in 'The Astrophysical Journal Letters', Chandrayaan-2 mapped the abundance of sodium on the Moon for the very first time using CLASS (Chandrayaan-2 Large Area Soft X-ray Spectrometer), the national space agency said in a statement on Friday. "Built at the U R Rao Satellite Centre of ISRO in Bengaluru, CLASS provides clean signatures of the sodium line thanks to its high sensitivity and performance," the statement said.

The study finds that a part of the signal could be arising from a thin veneer of sodium atoms weakly bound to the lunar grains. These sodium atoms can be nudged out of the surface by solar wind or ultraviolet radiation more easily than if they were part of the lunar minerals. Also shown is a diurnal variation of the surface sodium that would explain the continuous supply of atoms to the exosphere, sustaining it, the statement said. An interesting aspect that widens the interest in this alkali element is its presence in the wispy atmosphere of the moon, a region so thin that the atoms there rarely meet.

This region, termed an 'exosphere', begins at the surface of the moon and extends several thousand kilometres merging into the interplanetary space, the statement noted. "The new findings from Chandrayaan-2, provide an avenue to study surface-exosphere interaction on the moon, which would aid development of similar models for mercury and other airless bodies in our solar system and beyond," the ISRO said.

https://indianexpress.com/article/technology/science/chandrayaan-2-spectrometer-maps-abundance-of-sodium-on-moon-for-first-time-8197092/lite/

DECCAN Chronicle

Sun, 09 Oct 2022

ISRO to Launch 5.4 Tonne Satellites, Payload to be India's Heaviest

The Launch Vehicle Mark III (LVM3) is seen at the Vehicle Assembly Building at the Sriharikota Range (Shar), in Nellore district in Andhra Pradesh. (By Arrangement) **Nellore**: The Indian Space Research Organisation (Isro) hopes to set a record on October 22, when it has scheduled to launch 36 satellites cumulatively weighing about 5,400 kg. This would be the heaviest payload ever to be launched into space from Indian soil.

The satellites would be launched by the LVM3 (Launch Vehicle Mark 3), which can carry 10,000 kg to Low Earth Orbit. The LVM3, previously called the GSLV Mark III, is scheduled for launch early on October 22 from the Satish Dhawan Space Centre, Sriharikota Range (Shar) in Andhra Pradesh. The launch of the 36 broadband communication satellites is part of a deal between NewSpace India Limited (NSIL), the commercial arm of Isro, and Network Access Associated Limited (OneWeb). The 36 satellites, each weighing about 150 kg, will be placed in the low earth orbit.

This contract is stated to be a historic milestone for NSIL and Isro as the LVM3 is making its entry into the global commercial launch service market. India's Bharti Group is a major shareholder in OneWeb. Isro officials said two solid fuel strap-on boosters and a liquid core stage of LVM3 had been integrated at the second launch pad at Satish Dhawan Space Centre. The satellites have been assembled with the dispenser unit. In the coming days, the integration of the cryogenic upper stage of the rocket and the integration of payload fairing will take place.

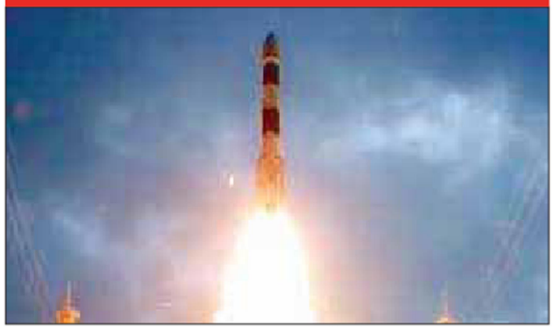
https://www.deccanchronicle.com/amp/science/science/091022/isro-to-launch-54-tonne-satellites-payload-to-be-indias-heaviest.html

पंजाब केसरी

शनिवार, 08 अक्टूबर 2022

रॉकेट रोहिणी का लगातार 199वां सफल प्रक्षेपण

केरल के तिरुवनंतपुरम के निकट थुंबा में 3.5 मीटर लंबा आरएच -200, रोहिणी का प्रक्षेपण किया गया



चेन्नई, (पंजाब केसरी): भारतीय अंतरिक्ष अनुसंधान संगठन (इसरो) ने चार से 10 अक्टूबर तक विश्व अंतरिक्ष सप्ताह मनाने के हिस्से के रूप में शुक्रवार को रोहिणी आरएच-200 रॉकेट का लगातार 199वां प्रक्षेपण सफलतापूर्वक किया। इसरो की ओर से जारी बयान के अनुसार यह एक उल्लेखनीय मील का पत्थर हासिल करेगा क्योंकि यह इस महीने के अंत या नवंबर की शुरुआत में 200 वां प्रक्षेपण निर्धारित है।।

थुंबा स्थित विक्रम साराभाई अंतरिक्ष केंद्र (वीएसएससी) के एक अधिकारी ने बताया कि केरल के तिरुवनंतपुरम के निकट थुंबा में 3.5 मीटर लंबा आरएच -200, रोहिणी का प्रक्षेपण किया गया। यह ध्वन्यात्मक रॉकेट परिवार का एक विश्वसनीय सदस्य है, जिसका इस्तेमाल इसरो द्वारा वायुमंडलीय अध्ययन के लिए किया जाता है। इसका प्रक्षेपण थुंबा से 1145 बजे सफलतापूर्वक किया गया। उन्होंने कहा कि लगातार 198 सफल उड़ानें पूरी करने के बाद आरएच-200 ने आज 199वीं सफल उड़ान पूरी की और सभी मानदंड सामान्य हैं। इसरो के बयान में कहा गया है कि थुंबा से प्रक्षेपित होने वाला पहला ध्वन्यात्मक रॉकेट 21 नवंबर, 1963 को अमेरिकी नाइके-अपाचे था। उसके बाद, रूस (एम-100) और फ्रांस (सेंटौर) से आयातित दो चरणों वाले रॉकेटों को उड़ाया गया। इसरो ने 1967 में अपना स्वयं का संस्करण - रोहिणी आरएच -75 - लॉन्च किया। साउंडिंग रॉकेट प्रोग्राम वास्तव में वह आधार था जिस पर लॉन्च वाहन प्रौद्योगिकी का निर्माण किया गया था। ध्वन्यात्मक रॉकेट एक या दो चरण के ठोस प्रणोदक रॉकेट हैं जिनका उपयोग ऊपरी वायुमंडलीय क्षेत्रों की जांच और अंतरिक्ष अनुसंधान के लिए किया जाता है। रॉकेट के संदर्भ में ध्वनि 'माप लेने' के बराबर है। वे लॉन्च वाहनों और उपग्रहों में उपयोग के लिए नए घटकों या उप-प्रणालियों के प्रोटोटाइप का परीक्षण या प्रदान करने के लिए आसानी से किफायती प्लेटफॉर्म के रूप में भी काम करते हैं।

वर्ष 1963 में थुम्बा (चुंबकीय भूमध्य रेखा के करीब एक स्थान) में थुम्बा इक्वेटोरियल रॉकेट लॉन्चिंग स्टेशन की स्थापना के साथ, भारत की एरोनॉमी और वायुमंडलीय विज्ञान के दायरे में एक बड़ छलांग थी।