

Made in India Tejas NLCA– first step towards self-sufficiency in having fighters off an aircraft carrier

India's indigenously developed single-engine, delta wing; multirole light fighter called Tejas is a light combat aircraft (LCA) that uses fourth-generation technology. This aircraft was in making for few decades (a project of the 1980s) and the entire project did face a phase of major criticism for the delays and lack of technological capabilities in comparison with other fourth general flying platforms available in the global market. However, now the project looks to be much on track and this aircraft has already been inducted in the Indian Air Force (IAF) during January 2015. IAF has inducted these aircraft in their inventory and they are performing various designed roles satisfactorily. This state-of-art aircraft has been designed by the Aeronautical Development Agency and Hindustan Aeronautics Limited for the Indian Air Force and Indian Navy. This aircraft programme began with a vision to replace India's ageing MiG-21 fighters.

Tejas has quadruplex digital fly-by-wire Flight Control System (FCS) with associated advanced flight control laws. The entire project is expected to produce various categories (versions/makes) of this flying platform. These aircraft would be used for 'air combat' and for 'offensive air support' roles and in addition with 'reconnaissance' and 'anti-ship' as its secondary roles. The Tejas project has made a very good beginning for the year 2020, when recently the fighter variant of the naval prototype (NP-2) of Light Combat Aircraft (NLCA) undertook its maiden carrier landing on the deck of INS Vikramaditya, successfully. On January 12, 2020, the NLCA undertook its first take-off from the ship deck. This take-off happened after the aircraft for the first-time had stayed on the ship overnight. The first ski-jump from the carrier was a major event and the aircraft had to undergo extensive checking before that. All this has allowed the technical and flying staff to gain valuable 'on-sight' experience.

The officials have informed that "After completing trials on the SBTF (Shore Based Test Facility) successfully, NLCA did numerous approaches and touch and go on INS Vikramaditya. The first arrested landing and ski-jump take-off were successfully executed as per the plans." During the last quarter of 2019, NLCA Mk1 prototypes had carried out several arrested landings at the Shore Based Test Facility (SBTF) located in INS Hansa. These arrested landings were of immense use towards testing various parameters and also helped to understate about the capabilities both of flying platforms and other ground infrastructure. More than 20 of such landings are known to have taken place since mid-October 2019. The very first 'night' landing was performed on November 13, 2019.

In general, India's military doctrine aircraft carrier has an important role. INS Vikramaditya is a modified Kiev-class aircraft carrier and the flagship of the Indian Navy. This carrier entered into service in 2013. This is actually a second-hand carrier and is purchased from Russia. It was earlier known as Baku and was commissioned with the Soviet Navy in 1987. Later with the Russian Navy, it was known as Admiral Gorshkov which got decommissioned in 1996. For India, with a very large maritime boundary to protect (both during wartime and peaceful) the presence of such warship that serves as a seagoing airbase is extremely important.

Indian Navy is a part of the LCA programme and has much at the stake since actually they are the end-users of this project. NLCA is a modified version of the LCA produced for the IAF. It is important to note that there is a significant amount of difference between the fighter aircraft which operates from the runways on the ground and the one that files from the deck. NLCA Mk1 design is known to have some limitations in that context. Hence, the instead of opting for any improvisation of NLCA Mk1 and develop Mk 2 as a next step, the Aeronautical Development Agency (ADA) is now proposing to

develop a Twin-Engine Deck Based Fighter (TEDBF) for the Indian Navy. This project is still in the process of conceptualisation. It is expected that the final product could enter service during 2030-35 period.

At present, the successful landing/take-off of NLCA on and from the deck of INS Vikramaditya should be considered as a first step towards India's achieving self-sufficiency in the field of fighter aircraft operations from a sea-based platform.

<https://www.defencenews.in/article/Made-in-India-Tejas-NLCA%e2%80%93first-step-towards-self-sufficiency-in-having-fighters-off-an-aircraft-carrier-808973>



Wed, 22 Jan 2020

IAF Plans to induct indigenous ‘astra’ missiles in light combat aircrafts as DRDO completes trials

The Indian Air Force (IAF) wants the indigenous *Astra* missiles as its standard long-range weapon for its Light Combat Aircraft (LCA). This will promote integration of indigenous technology on board LCA as well as other platforms, reports *The Economic Times*.

The LCA will not carry the French Meteor beyond visual range air-to-air missile (BVRAAM) which will be outfitted with the Rafale fighter jets. However, the French were also not interested in integrating their weapons system with Israeli-origin radar.

“We are not even looking at the French option. We want to promote the indigenous system and have it equipped across all our platforms. The Astra development programme has been satisfactory,” a top official said.

After extensive testing of Astra missile, IAF and the Defence Research And Development Organisation (DRDO) on 17 September 2019 carried out successful user trials of the Astra Beyond Visual Range (BVR) missile.

A live aerial target was engaged accurately demonstrating the capability of India's first indigenously developed air-to-air missile. Various radars, Electro-Optical Tracking Systems (EOTS) and sensors tracked the missile and confirmed its engagement with the target.

IAF also plans to induct Astra missile into the Su30MKI fighter jets from which it has been tested and it will also be integrated on other foreign-origin combat aircraft.

As user trials for Astra have been completed the next step will be production order for the missile system and integration tests are being carried out as part of weapons package for 83 of the Mk1A version.

“Astra initially had some technological challenges, which have been overcome successfully. With our persistent effort and with active IAF support, all the user evaluation has been completed and Astra is now ready for induction,” DRDO chief G Sateesh Reddy had told ET.

With a range of 75-100 km, Astra is a major addition to the Indian arsenal and paves the way for future air-to-air missile development within India. The range puts it at par with the French Mica BVR missiles but falls short of the Meteor with 150 km range.

<https://swarajyamag.com/insta/iaf-plans-to-induct-indigenous-astra-missiles-in-light-combat-aircrafts-as-drdo-completes-trials>

Wed, 22 Jan 2020

Indian MoD approves procurements for the army worth USD716.6 million

By Rahul Bedi

New Delhi: India's Ministry of Defence (MoD) approved on 21 January the procurement of indigenously developed equipment worth INR51 billion (USD716.6 million) for the Indian Army (IA).

The MoD's Defence Acquisition Council (DAC), which is headed by Defence Minister Rajnath Singh, gave the green light for the acquisition of an undisclosed number of electronic warfare (EW) systems that will be designed by the state-owned Defence Research and Development Organisation (DRDO) and manufactured locally.

The IA will deploy these systems in the country's plains and desert regions to "provide comprehensive electronic support and counter-measure capabilities to field formations", according to a statement by the Indian government's Press Information Bureau (PIB).

The DAC also approved prototype testing of DRDO-designed trawl systems for the IA's T-72 and T-90 main battle tanks to give them a mine-clearance capability.

The council also cleared a shortlist of local 'Strategic Partners' (SPs) to progress Project 75I (India), which is aimed at locally building six diesel-electric submarines for the Indian Navy (IN) for an estimated INR450 billion in collaboration with a foreign original equipment manufacturer (OEM).

Although neither the shortlisted SPs nor the OEMs were identified in the PIB statement, industry sources told *Jane's* that the shortlisted SPs include state-owned Mazagon Dock Shipbuilders Limited (MDL) and private-sector Larsen & Toubro (L&T), adding that the inclusion of a third SP is being considered by the MoD.

The selected OEMs include Naval Group (France), ThyssenKrupp Marine Systems (Germany), Rosoboronexport (Russia), Daewoo Shipbuilding and Marine Engineering (South Korea), and Navantia (Spain), added the sources.

https://janes.ihs.com/Janes/Display/FG_2651181-JDW

Wed, 22 Jan 2020

DAC okays procurement of Rs 5,100 cr indigenous equipment

New Delhi: The Defence Acquisition Council (DAC) chaired by Defence Minister Rajnath Singh approved several procurement proposals to boost the 'Make in India' initiative.

The DAC accorded approval for procurement of equipment worth over Rs 5,100 crore from indigenous sources.

The DAC also approved prototype testing of trawl assemblies designed by DRDO for T-72 and T-90 tanks providing an important indigenous de-mining capability to the Army.

The council headed by Singh, in its first meeting of 2020 and after the constitution of Chief of the Defence Staff, met on Tuesday to consider a number of new and ongoing proposals for procuring critically needed platforms and equipment for the armed forces.

To promote indigenisation, the DAC accorded approval for procurement of equipment worth over Rs 5,100 crore from indigenous sources. These include sophisticated Electronic Warfare Systems for the Army designed by Defence Research and Development Organisation (DRDO) and manufactured locally by the Indian industry. These systems will be used in deserts and plains and will provide comprehensive electronic support and counter measure capabilities to the field formations in both communication and other aspects of electronic warfare.

The DAC also approved prototype testing of trawl assemblies designed by DRDO for T-72 and T-90 tanks.

In another significant step, the DAC approved shortlisting of Indian Strategic Partners (SP) and the potential Original Equipment Manufacturers (OEMs) that would collaborate with SPs to construct six conventional submarines in India.

This programme is being progressed under the 'Strategic Partnership Model', promulgated in 2017 to give a major boost to 'Make in India' in defence sector.

The strategic partner is expected to play a transformational role in building an eco-system in the country, comprising development entities, specialised vendors and suppliers; especially those from the MSME sector.

SP model also aims at promoting India as a manufacturing hub for defence equipment, in addition to establishing an industrial and R&D eco-system capable of meeting the future requirements of the armed forces besides giving a boost to exports.

The DAC also accorded approval for inclusion of Innovations for Defence Excellence (iDEX) in defence procurement procedure. This would provide avenues in capital procurement for the armed forces to startups and innovators working for iDEX and provide a huge fillip to their budding efforts.

"Today's decisions are also in keeping with the mandate given to the CDS and the newly-constituted Department of Military Affairs to promote use of indigenous hardware by the services," the Ministry of Defence said.

<http://www.daijiworld.com/news/newsDisplay.aspx?newsID=665721>

INDIAN DEFENCE NEWS

Wed, 22 Jan 2020

How K-4 submarine launched ballistic missile stack up against Pakistan, China?

The K-4, developed by India's Defence Research and Development Organisation (DRDO) with a range capability of 3,500 km, will be an intermediate range submarine launched ballistic missile (SLBM).

The K-4 arms India's first indigenously-Ship Submersible Ballistic Nuclear (SSBN) the INS Arihant class submarines, completing India's nuclear triad of delivery vehicles.

DRDO in April 2019 had test-fired the K-4 nuclear-capable submarine-launched ballistic missile (SLBM)–from aboard the INS Arihant, the first submarine in its class. According to press reports, the test was “highly successful & a roaring success” and involved a fully operationally configured K-4 with a dummy payload. Notably, the K-4 was tested using depressed trajectories.

The K-4 aboard the INS Arihant and future Indian SSBN's will give India the ability to target most of China, including Beijing, and all of Pakistan when operating in the northern parts of the Bay of Bengal.

While technical details are hard to ascertain given the levels of secrecy involved, the K-4, which underwent its last test on 19th Jan 2020, reportedly has a length of 12 metres, a diameter of 0.8 metres, and can carry a conventional/nuclear payload of up to 2 tons.

The missile is powered by solid rocket boosters and is highly accurate with a near-zero circular error probability.

The INS Arihant will have the capability to carry four K-4 missiles, and the follow-on SSBN's that are planned will have the capacity to carry eight K-4 or such SLBM's each. Future submarines will reportedly be larger and will carry missiles of longer range like the S-5, which will have a reach of over 5,000 kilometres.

India has an officially adopted posture of no first use and assured retaliation.

Hence, India considered it essential to develop capabilities to eventually deploy continuous at-sea nuclear deterrence to ensure the survivability of its nuclear second-strike capability. DRDO officials in the past have stated that the circular error probable (CEP) of the K-4 to be 40 meters or less, which would make it an ideal weapon system for a sea-based counter-force capability from stand-off ranges.

In theory, a sea-based nuclear deterrent is invulnerable once undersea because it can hide and is not trackable or targetable by adversaries, unlike ground-based systems. This is especially important to India, as its land-based systems will have little reaction time given the proximity of Pakistani and Chinese nuclear weapons.

Pakistan Purchasing Yuan-Class Diesel-Electric Submarines

Pakistan has over the last few years pursued strategic parity with India's growing underwater nuclear capabilities in an attempt to negate its conventional superiority.

The Pakistani navy created a strategic command a few years ago which went on to recently test a nuclear capable submarine launched cruise missile with a range of 450 kilometres in the form of the unverifiable existence (mythical) of Babur-III.

Islamabad has claimed second-strike capability. Pakistan is currently in the process of purchasing eight Yuan-class diesel-electric submarines from Beijing. Added to the existing three French Agosta-90B/Khalid and two Agosta-70 submarines of the Pakistan Navy and the ambiguity of deploying nuclear-armed cruise missiles on conventional submarines will be highly destabilising, with covert help from China.

This would make prosecution of targets vis-à-vis Pakistan extremely difficult for the Indian Navy in the years to come.

China's Nukes Can Destroy Most of India

China, on the other hand, has an operationalised at-sea nuclear deterrent and had sent a Jin-class SSBN out on its first deterrent patrol, according to press reports, in December 2015.

The submarine is armed with up to 12 JL-2 nuclear armed SLNM's with a estimated range of 7,200 kilometres, meaning most of India falls within its range from its operating bastion of the South China Sea.

India's eventual induction of SSBN's in numbers armed with K-4 missiles is unlikely to change or draw any reaction from Beijing apart from an increase of probes by the Chinese Navy in the Bay of Bengal region to track and monitor patterns in India's SSBN deployments.

From Civilian Control of Weapons To Military Control

India is a nuclear weapons state, the newly appointed CDS will also act as the military adviser to the Prime Minister on nuclear issues. There are certain formalities such as the charter, hierarchy in the government and the duties of the CDS which has been chalked out. The primary responsibility of the

CDS would be to coordinate and prioritise procurement for the military based on the inputs from the three service chiefs and the secondary more importantly will have nuclear weapons under his charge.

Historically, Indian nuclear warheads and delivery systems are unmated and housed at different locations. In stark contrast and as a first, deployment of an undersea launch capability will require weaponisation of the K-4 and represents a shift from civilian control of nuclear weapons to military control.

The induction in the future of the K-4 will require a review and strengthening of India's C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) capabilities and procedures to prevent any unauthorised commands or accidental launches. With the induction and deployment of the K-4 in the coming years, India will field a comprehensive spectrum of options which fulfil India's deterrence and strategic needs.

<http://www.indiandefensenews.in/2020/01/how-k-4-submarine-launched-ballistic.html>



Wed, 22 Jan 2020

Desi field gun Sharang clears field test

Jabalpur: The 155 mm towed field gun Sharang has cleared the final field test and is ready to be inducted in the Indian Army sometime before March 31, sources in the Ordnance Factory board (OFB) said on Tuesday.

The Advanced Towed Artillery Gun System (ATAGS) is a towed 155 mm/52 calibre howitzer upgraded indigenously.

The first fleet of 18 towed artillery 130 mm guns indigenously upgraded to 155 mm with a strike range of 39 km, cleared the final muster at Khamaria on Tuesday. The earlier striking range was 27 km.

The gun underwent integrated firing check at the Long Proof Range of Ordnance Factory Khamaria off Jabalpur on Tuesday, defence sources said.

The Gun Carriage Factory (GCF) in Jabalpur district had clinched the global contract for upgrading the Sharang gun.

Various government institutions are involved in the indigenous upgrade of the Sharang gun, including the ordnance factories, a team of Indian Army, DRDO and others.

Sources said the gun has successfully gone through the integrated firing checks on different parameters ranging from 0 degree to 45 degrees.

(Disclaimer: This story has not been edited by Outlook staff and is auto-generated from news agency feeds. Source: IANS)

<https://www.outlookindia.com/newscroll/desi-field-gun-sharang-clears-field-test/1714208>

Wed, 22 Jan 2020

NIT Rourkela alumnus to head new DRDO lab

Bhubaneswar: Parvathaneni Shiva Prasad, an alumnus of NIT Rourkela, has been chosen to head one of newly launched Young Scientists Laboratories (DYSLs).

The Defence Research & Development Organisation (DRDO) has set up the labs to start focused research on advanced technologies. Prime Minister Narendra Modi had dedicated these labs to the nation last week.

Prasad, who hails from Khammam in Telangana, has been selected as the Director of the Asymmetric Technologies Lab based near IIT-Kharagpur. The lab will be specialising in nano-technologies, unmanned aerial vehicles, drones, cyborgs and so on, The Hindu reported.

At present, 34-year-old Prasad is pursuing his PhD with the Indian Institute of Science, Bengaluru.

As per the norms, Prasad will be a wholly independent director of the lab akin to the existing heads of other DRDO labs.

<https://odishabytes.com/nit-rourkela-alumnus-to-head-new-drdo-lab/>