

Thu, 21 Feb 2019

# Aero India 2019: LCA Tejas gets clearance for induction into IAF, US pitches for Make in India

*Eyeing an Indian order, US aerospace major Lockheed Martin on Wednesday showcased its F-21 multirole fighter that it says is configured for the IAF*

India's Light Combat Aircraft (LCA) Tejas has received final operational clearance from military aviation regulator Cemilac for induction into the Indian Air Force (IAF) as a weaponised fighter jet, said an official here on Wednesday.

The Centre for Military Airworthiness and Certification (Cemilac) Chief Executive P. Jayapal handed over the "release-to-service" documents to the Chief of Air Staff Air Marshal B.S. Dhanoa at the Aero India air show here.

"It is a major milestone for LCA to get the final operational clearance. The aircraft could fly in many sorties and demonstrated the precision with which it can deliver weapons," Dhanoa told the media.



The aircraft performed air-to-ground attacks and air-to-air refuelling at IAF's Vayu Shakti air display at Pokhran in Rajasthan on February 16, the IAF chief said.

State-run Hindustan Aeronautics Ltd Chairman and Managing Director R. Madhavan said HAL has responded to the request for proposal (RFP) floated by the IAF for 83 LCA Mk-1 with weaponisation.

"The grant of final operational clearance to the aircraft is a landmark moment for aeronautic scientists, industry and businesses," state-run Defence Research Development Organisation (DRDO) Chairman G. Satheesh Reddy told the media.

## **Locheed Martin offers India a new F-21 combat jet to be made locally**

Eyeing an Indian order, US aerospace major Lockheed Martin on Wednesday showcased its F-21 multirole fighter that it says is configured for the IAF.

"Our F-21 addresses the IAF's requirements and integrates India into the world's fighter aircraft ecosystem," a Lockheed Martin spokesperson told IANS on the margins of the Aero India expo at the Yelahanka air base.

The spokesperson, however, clarified that India was yet to float a request for information or proposal for the new aircraft.

"The F-21 is different, inside and out. It highlights our commitment to deliver an advanced, scalable fighter for IAF," Lockheed Martin's Vice President for business and strategy development Vivek Lall said in a statement.

If Lockheed Martin gets the order, it says it will make the fighter in India with Tata Advanced Systems of the Tata Group.

<https://www.thenewsminute.com/article/aero-india-2019-lca-tejas-gets-clearance-induction-iaf-us-pitches-make-india-97075>

## THE HINDU BusinessLine

*Thu, 21 Feb 2019*

### **LCA Tejas for IAF gets final operational clearance**

The first day of Aero India 2019 is a significant day in the journey of Light Combat Aircraft Tejas MK I for Indian Air Force (IAF), as a formal declaration of Final Operational Clearance (FOC) of the aircraft was made by Secretary Defence R&D and Chairman DRDO Dr G Satheesh Reddy.

The day also witnessed the handing over of FOC Certificate and Release to Service Document (RSD) to the Chief of Air Staff in the presence of Defence Secretary and CMD, HAL.

FOC involves addition of key capabilities to the Initial Operational Clearance (IOC) aircraft which in main are Beyond Visual Range Missile capabilities. Air-to-Air Refuelling, Air-to-Ground FOC earmarked weapons and general flight envelope expansion.

The RSD provides the capabilities, features and technologies that FOC standard Aircraft will have on Induction into IAF. The FOC standard Aircraft drawings have already been handed over to Hindustan Aeronautics Ltd (HAL) to start production after incorporating key changes over the IOC standard Aircraft.

Initial Operational Clearance (IOC) of the aircraft took place in 2013 and IOC standard aircraft were inducted into IAF No. 45 Squadron, in July 2016. The IAF Squadron has since flown over

About 1,500 sorties successfully on the aircraft. It is a proud day for all the agencies involved in the design, development and production of the aircraft i.e., Aeronautical Development Agency (ADA), the autonomous society of DRDO as the design agency and HAL as the manufacturer. Many other DRDO laboratories such as ADE, GTRE, LRDE and CEMILAC , as well as other agencies such as BEL, CSIR, DG-AQA, and private sector agencies have contributed in the journey of LCA.

<https://www.thehindubusinessline.com/economy/lca-tejas-for-iaf-gets-final-operational-clearance/article26323650.ece>

## **The Tribune**

*Thu, 21 Feb 2019*

### **Recce by two IAF copters**

Dalhousie: In view of an avalanche advisory issued by the Snow and Avalanche Study Establishment (SASE), Manali, in Pangi and Bharmour of Chamba district in 24 hours, two helicopters of the Indian Air Force (IAF) today took off to carry out a recce of the valley.

DC Harikesh Meena said the recce was part of the recent discussions held with military officials to extend help for rescue operations during avalanche-like situation and other natural calamities,

especially in the snowbound areas of the district. The helicopters, however, could not be able to land in the Pangi valley due to bad weather conditions.

The district administration was in constant touch with officials. — OC

<https://www.tribuneindia.com/news/himachal/recce-by-two-iaf-copters/732202.html>

#SWARAJYA

Thu, 21 Feb 2019

## **Aero India: DRDO to unveil LCA Tejas Mk.2 model with higher range, larger weapon capacity and more sensors**

Bangaluru: Defence Research and Development Organisation (DRDO) is all set to unveil a model of the 'Medium Weight Fighter' (MWF), a name given last year to the Light Combat Aircraft (LCA) Mk.2, at the 2019 Aero India show in Bengaluru, reports *Livefist*.

According to the report, the aircraft was given a new name after the Aeronautical Development Agency (ADA) (which handles the Tejas jet programme) concluded that it was a heavier jet than the baseline LCA Mk.1 and has a significantly greater capacity to carry weapons.

Furthermore, there is also increase in the range and endurance capacity of the fighter jet than its predecessor. Infrared Search and Track sensor has also been introduced in the MWF. The aircraft also features a missile approach warning system.

However, the name change has nothing to do with India's fifth generation stealth concept, known as Advanced Medium Combat Aircraft (AMCA), which is an entirely separate programme.

As per the report, the model being unveiled will likely reflect the air-frame changes that necessitated aircraft's redesignation to a medium weight/Mirage 2000 category. It will have heavier airframe with changes to incorporate the F414 turbofan engine.

<https://swarajyamag.com/insta/aero-india-drdo-to-unveil-lca-tejas-mk2-model-with-higher-range-larger-weapon-capacity-and-more-sensors>

#SWARAJYA

Thu, 21 Feb 2019

## **Aero India: Indigenous stealth fighter to initially use US engines**

*By Anantha Krishnan M.*

The Advanced Medium Combat Aircraft (AMCA) project of India has gone deep into the detail design phase now. Along with the Aeronautical Development Agency (ADA), hundreds of scientists spread across at least 20 labs of Defence Research and Development Organisation are now engrossed in critical work to find solutions to a number of next-generation technologies that need to be proven.

With the project definition phase (PDP) getting over in 2017, *Onmanorama* can confirm that scientists have already walked some distance designing the AMCA, India's stealth fighter.

ADA, the designer of Light Combat Aircraft (LCA) Tejas, is spearheading the AMCA mission.

The AMCA will be propelled by a US-origin GE F414 engine with a thrust of over 90kN and this will be an interim step by the makers till a higher-thrust engine of 110kN is finalised. The F414 engine, set to power the Tejas Mk-II, will power AMCA as well, till India develops a 110kN engine, possibly in collaboration with a foreign partner.

The current plan is to fly AMCA with the F414 engine for the first six-seven years, in what the designers now term as an 'interim engine' for India's fifth-generation stealth platform. While the design phase has already been sanctioned to commence activities, the final approval for AMCA from the government (Cabinet Committee on Security) is in process.

The plan is to build four prototypes and fly the first one before 2025, which is seven years from now.

The Indian Air Force (IAF) is said to be working out the exact numbers for this future fighter, while the AMCA Directorate at ADA is ensuring a robust foundation for this big-ticket desi project.

### **Model to test stealth**

The feasibility study for the AMCA began in 2009 with an initial funding of Rs 90 crore. Last year, about Rs 400 crore came in for the detail design phase (DDP), which is expected to be completed in the next three years. Post that, the AMCA will get on to the crucial development phase: Flight testing and eventually certification.

With India finally ejecting out of jointly making the Fifth-Generation Fighter Aircraft (FGFA) with Russia, there was a stalemate over AMCA for a while and now the flight path seems to have cleared.

"This is for the first time ever in the country we are on a stealth design and the challenges are unique here. However, an advantage is we just have to concentrate on the fifth-generation technologies like stealth since we have already mastered all the fourth-generation technologies through LCA," an official told.

A full-scale model (1:1) of AMCA is being manufactured by VEM Technologies for stealth measurements.

DRDO is also displaying a scaled model of the Advanced Medium Combat Aircraft with audio-visual effects at Aero India 2019.

The 1:1 model will be taken to the Orange facility in Hyderabad or to Defence Laboratory, Jodhpur (DLJ), for testing the stealth features. DRDO's Orange facility was opened in 2015 to test current and futuristic weapon systems under development.

The scientists need to measure stealth features on the modular model being developed by VEM Technologies. Modularity is provided, so that new stealth technologies can be immediately incorporated and validated on the model. Orange can provide radar cross section (RCS) measurements and the pylon system at the facility can lift payloads up to 35 tonnes.

"Earlier, you used to make an aircraft and then check its stealth features. Now, from design stage itself, stealth features are part of the optimisation. It was an afterthought earlier, but in a fifth-generation fighter, stealth gets priority," the official said.

Scientists are hopeful of getting this 1:1 AMCA model ready for tests by the end of this year. Further optimisation of stealth features is under way. This is being done not only by scientists in DRDO and CSIR, but also many academic institutions including IISc in Bengaluru and various IITs.

"Stealth and aerodynamics don't go hand in hand, so you have to guarantee some minimum performance and optimise for stealth," the official said.

AMCA has been designed with multi-disciplinary optimisation (MDO) engineering route with stealth as an optimising parameter. (MDO brings in a number of engineering disciplines while finding solutions to complex problems.)

### **Loaded with features**

Detailed R&D on materials, paints and structures is being undertaken by various labs now. Study is also under way on flight control, avionics, aerodynamics, composite structure and general systems like brakes, hydraulics and fuels systems.

“We hope to have the first flight of AMCA before 2025 with all the stealth features being established by then. With reduced infrared (IR), we are working on the super-cruise abilities that give the aircraft capability to fly at supersonic speeds without the afterburner,” says the official.

Passive sensors, internal weapon bay, advanced integrated avionics, next-generation active electronically scanned array (AESA) radar, 360-degree enhanced situation awareness, integrated vehicle monitoring system (IVHM), serpentine air intake, infrared search and track (IRST), missile approach warning system (MAWS) and diverterless supersonic intake (DSI) are some of the features being claimed by Indian scientists that will make AMCA a powerful fighting machine.

Added features like suppression of enemy air defence (SEAD) and destruction of enemy air defence (DEAD) will also give more teeth to the beyond-visual range (BVR) characteristics of the AMCA.

“Parallel efforts to camouflage the aircraft to achieve visual and IR stealth will continue in the next few years,” adds the official.

As this *Onmanorama* Aero India 2019 special report jettisons into the web space, the AMCA back-room boys are initiating the full-scale engineering development (FSED) plans for AMCA.

India’s home-grown fighter programmes are on inspiring flightpath now, with the scientists gaining confidence in converting dreams into reality at a relatively faster pace. The lessons from LCA will probably act as a ready-reckoner.

<https://www.theweek.in/news/india/2019/02/20/aero-india-indigenous-stealth-fighter-engine.html>

## **The Tribune**

*Thu, 21 Feb 2019*

### **Ordnance Factory to make 114 Dhanush**

Kolkata: The Ordnance Factory Board (OFB) has received the “bulk production clearance” (BPC) from the Army and Ministry of Defence for supplying 114 number of ‘Dhanush’, the first-ever indigenous 155mm x 45 calibre artillery gun.

The weapon, according to a PIB (Defence Wing) press release issued here today, is the first long-range artillery gun to be produced in India and is a major success story of the ‘Make in India’ initiative”.

The gun is equipped with inertial navigation-based sighting system, auto-laying facility, on-board ballistic computation and an advanced day-and-night direct firing system. The self-propulsion unit makes the gun easily manoeuvrable in mountainous terrains.

‘Dhanush’ has been mechanically upgraded to fire standard NATO 155 mm ammunition and can accommodate both boll bags and the bi-modular charge system (BMCS). ‘Dhanush’ has also been electronically upgraded to improve firing accuracies and compatibility with various kinds of ammunition.

The performance of ‘Dhanush’ has been evaluated under arduous conditions in several phases. The guns have travelled extensively in towed and self-propelled mode in all terrains, including desert and high altitude areas, with each gun clocking over 1,600 km.

Such an extensive exercise was carried out by the user for the first time for any gun system under the process of induction.

'Dhanush' is the product of joint efforts by the OFB and the Army with contributions from the DRDO, DGQA, DPSUs such as Bharat Electronics Limited, PSUs such as SAIL and several private enterprises.

**First Indigenous artillery gun**

- The Ordnance Factory Board will make 114 first indigenous 155mmX45 calibre artillery guns
- According to officials, it is the first long-range artillery gun to be produced in India and is a major success story of the 'Make in India' initiative.

<https://www.tribuneindia.com/news/nation/ordnance-factory-to-make-114-dhanush/732084.html>