

India's 1st self-made fighter jet, LCA Tejas, formally joins Air Force

LCA Tejas received the final operational clearance for induction into the IAF as a fully-weaponised fighter jet

Bangalore: India's first self-made fighter jet Light Combat Aircraft Tejas or LCA Tejas is finally ready to be used in operations by the Indian Air Force.

LCA Tejas received the final operational clearance for induction into the IAF as a fully-weaponised fighter jet.

At a special ceremony at the Aero India 2019 - India's biennial air show in Bengaluru- the country's military aviation regulator handed over the final operational clearance certificate and other release-to-service documents to Chief of Air Staff Air Marshal Birender Singh Dhanoa.



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"It is a major milestone for the LCA (Tejas) to get the final operational clearance. The aircraft could fly in many sorties and has demonstrated the precision with which it can deliver weapons," Air Marshal Dhanoa said.

Air Marshal Dhanoa said, "LCA Tejas performed air-to-ground attacks and air-to-air refuelling at IAF's Vayu Shakti air display at Pokhran in Rajasthan on February 16."

DRDO Chairman and Defence R&D Secretary G Satheesh Reddy said, "The grant of final operational clearance to LCA Tejas is a landmark day for India's aeronautical engineers, scientists, the Indian Air Force, the defence industry and allied businesses."

Calling the LCA Tejas's FOC aircraft a "major milestone", Air Marshal BS Dhanoa said, "You saw how much the aircraft could fly, the number of sorties it could generate in exercises 'Gagan Shakti' in April 2018 and in 'Vayu Shakti' in February this year."

The 45 Squadron of LCA Tejas has successfully flown over 1,500 sorties during trials.

"It is a fighter jet and behaved like a fighter. It did well both in air-to-air combat, as well as air-to-ground combat," the air chief said.

<http://www.asianage.com/india/all-india/210219/indias-1st-self-made-fighter-jet-lca-tejas-formally-joins-air-force.html>

THE ASIAN AGE

Fri, 22 Feb 2019

DFRL develops low-cost sea dye cakes to help in rescue missions

Defence Food Research Laboratory (DFRL) in Mysuru has now developed indigenous cakes, costing just Rs 400 each to do the job just as easily

By Aknisree Karthik

Bengaluru: In the event of an emergency landing or crash by a military aircraft on the high seas, the rescue mission becomes highly challenging as identifying the spot of the accident is no easy task. While the Indian armed forces currently depend on imported sea dye cakes, costing Rs 3,000 each, to mark the spot of the crash or emergency landing to attract the attention of the rescue aircraft, the Defence Food Research Laboratory (DFRL) in Mysuru has now developed indigenous cakes, costing just Rs 400 each to do the job just as easily.

Sharing details about the product with this newspaper, Dr Pal Murugan, a scientist at the DRFL said, "We have already supplied our sea dye cakes to 16 BRD Army Aviation. The dye is of international MIL-S standards. Once it is placed in the life vest pockets it dissolves in water, creating a bright fluorescent green pattern, which is easily identifiable from even as high up as 3,000 feet in the air." The green pattern is eco-friendly and does not pollute the sea, according to him. "It is visible for nearly an hour and fades away later due to the movement of the tides. And now that it is affordable, the sea dye can be used by smaller boats and ferries too should they be involved in accidents," he added.

<http://www.asianage.com/india/all-india/220219/dfrl-develops-low-cost-sea-dye-cakes-to-help-in-rescue-missions.html>

THE HINDU BusinessLine

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DRDO scans the radar for allies

Defence undertaking on the lookout for partners who can co-develop tech

Bengaluru: After successfully readying the Light Combat Aircraft (LCA), or Tejas, for production, the Defence Research & Development Organisation (DRDO) has taken up more ambitious projects in the aeronautical sector.

The Advanced Medium Combat Aircraft (AMCA), which would be India's next indigenous fighter aircraft, and unmanned combat aerial vehicles are among some of the major aeronautical missions embarked on by the DRDO.

Inaugurating a seminar in connection with the 12th edition of Aero India 2019 in Bengaluru early this week, DRDO Chairman G Satheesh Reddy said the defence research body, which employs over 7,500 scientists, is scouting for potential partners, who can help it co-develop various future technologies, including a more powerful aero-engine for AMCA.

“An aero-engine of the 110-kilo Newton (kN) type that we want for AMCA is not available today,” Reddy was quoted as saying.

As per the proposed plan, the fifth generation fighter aircraft will initially fly with two GE-414 engines, which has 98 kN thrust. The first test flight of the aircraft is expected in 2032. In comparison, LCA, which is a four-plus generation fighter plane, uses a GE-404 engine that has a thrust of 84 kN.

The AMCA will be built on technologies developed for the LCA, but would have more futuristic technologies.

Participating in the Indian Science Congress held in Jalandhar in January, Samir V Kamat, Director General (Naval Systems & Materials) at DRDO, said the kind of materials required for making futuristic defence systems are quite different from what are available today.

“In the next 15-20 years, the metallic systems which currently account for 80 to 90 per cent of materials used in the defence system will go down to 30 to 40 per cent,” said Kamat.

For instance, materials like titanium alloys or aluminium alloys or carbon fibre reinforced plastics used in the aircraft have a weight-to-strength ratio of 1 and specific modulus — a measure of elasticity — in the range of 20 to 50. But new nano materials such as carbon nano tubes and graphene offer the possibility of improving both these parameters by around 100-fold.

“Currently, we are able to make carbon nano tubes, but the challenges of spinning them into continuous fibres which are long enough have not been overcome yet. But this will be done in the next 15-20 years, offering enormous possibilities,” he said.

Developing new materials and manufacturing them in ample quantities at low cost and in environmentally sustainable manner are some of the major challenges faced by defence technology experts all over the world.

Similarly, the cycle of designing and developing new materials has to shrink drastically in the near future to make them available for use in the defence systems.

Currently, the time taken to design and develop a new material used in the defence sector is around 15 to 20 years. It has to come down to 6-7 years, Kamat said.

Apart from the AMCA, the DRDO has been working on a number of UAVs, including those that can be used for combat applications, apart from reconnaissance.

In collaboration with domestic players, the DRDO has been developing different variants of UAVs.

Immersive experience

In Aero 2019, the DRDO is participating in a big way. According to official sources, it has showcased as many as 250 systems, technologies, working models and innovations. Around 24 laboratories under different technology clusters of the DRDO connected to the aerospace and aeronautics are displaying their products and showcasing their achievements.

These participating clusters are: Aeronautical Systems, Missiles, Armaments & Combat Engineering, Electronics & Communication Systems, Micro electronics Devices & Computational Systems, Naval Systems & Materials and Life sciences.

For instance, in the Indoor Pavilion, scaled models of LCA-Tejas variants viz., Airforce Mark-1, Medium Weight Fighter, Naval Variants and Trainer variants are displayed.

In addition, a scaled model of the twin engine stealth aircraft is being displayed with audio-visual effect.

DRDO is also showcasing proven expertise in the field of fighter aircraft simulators design and development through 360 degree immersive virtual experience kiosks.

<https://www.thehindubusinessline.com/economy/logistics/drdo-scans-the-radar-for-allies/article26332379.ece>



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AERO India: DRDO reveals plans for C295 variants

India's Defence Research Development Organisation (DRDO) plans to adapt the Airbus Defence & Space C295 tactical transport for special missions should a deal to obtain the type be finalized

By Greg Waldron

Bangalore: The company displayed two models of the C295 in its pavilion. The Multi-Mission Maritime Aircraft (MMMA) is aimed at the coast guard; the other is an airborne early warning & control (AEW&C) variant for the air force.

Ground tests have taken place on the proposed MMMA's mission systems, says a DRDO official.

"Once the airframe is available we can put the systems on it," he says.

The MMMA would include three tactical consoles, an active electronically scanned array (AESA) radar, identification friend and foe equipment, an electro-optical/infrared (EO/IR) sensor, and other equipment consistent with the maritime patrol mission.

Primary MMMA roles would include maritime surveillance, pollution surveillance, and search and rescue. Secondary roles include the transport of people and cargo and air ambulance duties.

The DRDO's C295 AEW&C concept remains in the initial planning stages and has not been formally proposed to the government. The plan would see the radar developed for New Delhi's three Embraer EMB-145 AEW&C Netra aircraft integrated with the C295.

New Delhi's C295 acquisition has been in the works for half a decade. The Airbus type will replace the air force's obsolete Avro Hawker Siddeley HS748s. Media reports indicate that the original number required for the air force, 56, has grown to 62 in order to provide the coast guard with six examples.

Original plans called for 16 to be built by Airbus, with the balance to be produced in India by Tata Advanced Systems.

One wrinkle in the conclusion of the C295 deal could be HAL. The local airframer has reportedly put forward a proposal to update the "Avro" with turboprop engines, new avionics, and a glass cockpit.

<https://www.flightglobal.com/news/articles/aero-india-drdo-reveals-plans-for-c295-variants-455993/>

India to test fire nuclear-capable 'nirbhay' cruise missile in april

*An indigenously designed and developed cruise missile is slated
to make its final developmental flight in April*

By Franz-Stefan Gady

India's Defense Research and Development Organization (DRDO) is slated to conduct the final developmental flight trial of the nuclear-capable Nirbhay cruise missile, the country's first indigenously designed and developed long-range cruise missile, according to an official of India's Aeronautical Development Establishment (ADE).

Preparations are under way for a low-altitude flight test the ADE official told Jane's during the February 20-24 Aero India 2019 exhibition in Bangalore. The last successful test launch of the missile took place at the Integrated Test Range on Abdul Kalam Island off the coast of Odisha in November 2017. A Previous test launch in December 2016 ended in failure as the missile had to be destroyed in mid-air after it deviated from its course.

Two other test launches also ended in failure, with only one other flight trial, conducted in October 2014, declared a success. DRDO engineers have pointed to problems with the flight control software and navigation system of the Nirbhay, as well as hardware design flaws, for the causes of the failed missile tests. Without offering any details, the ADE officials noted that past issues related to the missile's control hardware and software have apparently now been fixed.

"The ADE official said that the missile program is on track and expressed optimism that the weapon will soon be moving into the production-standard configuration, followed by the operational testing phase," Jane's reports on February 21. "He added that once the technology behind the missile is certified, there is a proposal to develop an air-launched variant of the Nirbhay within two to three years."

The Nirbhay is a subsonic long-range land attack cruise missile that can be armed with a 300-kilogram warhead. The nuclear-capable, solid fuel, missile is capable of reaching speeds of 0.6-0.7 Mach and can strike land targets at a distance of up to 1,000 kilometers. Notably, while the Nirbhay missiles for the first four trials were powered by Russian-made NPO Saturn 36MT mini turbofan engines, the missile prototype slated to be launched in April will carry the indigenously designed and developed Manik turbofan engine.

The Ministry of Defense (MoD) has considered axing the Nirbhay program on multiple occasions over the past years for numerous reasons including technical issues with the weapon system, funding difficulties, and questions over the operational need for a subsonic, long-range cruise missile given the existence of the more reliable but shorter ranged BrahMos supersonic cruise missile.

Notably, DRDO is working on an extended-range air-launched variant of the BrahMos supersonic cruise missile, designated BrahMos-ER, with an estimated strike range of around 800 kilometers. The development of a new 800-kilometer range BrahMos-ER could be an indication that India will deploy the BrahMos as part of the air component of its nuclear triad, although the Indian government has not publicly confirmed to date that it is seeking a nuclear capability for the supersonic cruise missile.

<https://thediplomat.com/2019/02/india-to-test-fire-nuclear-capable-nirbhay-cruise-missile-in-april/>

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Missile test range bodies to form int'l range society

The three-day International Conference On Range Technology (ICORT) which was organised in the venue of DRDO, Chandipur, under aegis of the Integrated Test Range (ITR) concluded on Sunday after a high-note cultural event.

In the international event, scientists of ITR and others, the DRDO laboratories, the ISRO establishments, researchers, industries, organisations and vendors associated with missile development and testing range of 18 other countries participated and deliberated on different aspects.

The guests and dignitaries were Director IIT, Bhubaneswar Dr Rajat Kumar, Director, Proof and Experimental Establishment (PXE), Chandipur, DK Joshi, Dr Tincom of USA, Richard Marchan of France, Dr Marqman of Israel and Dr Shiv Kumar.

It was decided to form an International Range Society for exchange of technologies among various missile testing ranges for further development and optimum utilisation of technologies.

In the society while members would be from different countries, India would be playing a key role in functioning of the society.

For the student community, the ITR hosted a programme under the name of 'Agle Kalam ki Khoj.' Among the innovative idea and thoughts projects presented by them, best 40 projects were shortlisted.

During the programme as many as about 200 research papers were presented while 76 of them were highly appreciated by the jury panel.

The scientists who received best awards for their papers were Hari Sankar Rokkam, Gautam Sadhukhan, Avijit Jena and Pradipta Roy. Senior scientists B Suchirita, CR Ojha, Niladri Roy, Nilam Pal and other senior officials SK Behera, AK Panda, Khageswar Sahu, PK Senapati and M Achari were among others present.

<https://www.dailypioneer.com/2019/state-editions/missile-test-range-bodies-to-form-int---l-range-society.html>



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After giving India its first self-made fighter jet, Tejas team to steer own passenger plane dream

The father of the LCA project, Dr Kota Harinarayana who directed the project for over 20 years from start to the first two jets, is also in the team

By Deepa Balakrishnan

Bengaluru: After sending the cheapest mission to Mars, India is now aiming to manufacture passenger planes that will cost at least 20% lesser than the global market rates.

A Special Purpose Vehicle (SPV) to work on this has been set up and it has roped in the makers of the Light Combat Aircraft (LCA) Tejas, the country's first fighter jet project. The commercial plane could accommodate 70 to 90 passengers.

NITI Aayog member and former DG of DRDO, VK Saraswat, told CNN-News18 that India could come up with its first large home-grown passenger jet in the next five to seven years. India has been working for nearly 30 years on a 19-seater plane, the Saras, that is still in the works.

"Today we have an SPV and mostly in an autonomous manner, we want to ensure that a regional transport aircraft with a capacity of 70 to 90 passengers should be developed using indigenous technologies as we have developed under the LCA and others. We have the right eco-system, in terms of private industries that could complement the development, for it. I feel an RTA can be developed in the next five to seven years if we are in position to take decisions at this stage," Saraswat told CNN News18 on the sidelines of Aero India 2019.

The SPV will have stake-holders from the DRDO, the HAL, and academic institutions -- a heterogeneous group that will steer the process. The father of the LCA project, Dr Kota Harinarayana, who directed the project for over 20 years from start to the first two jets, is also in the team.

The efforts are being made to make the plane price competitive on the global stage. "I'm 100 per cent sure we will make it price-competitive. We can make it at least 20 per cent cheaper and 20 per cent is a big difference for an airline operator to buy an aircraft," Dr Harinarayana told CNN News18.

But a policy push from the government is also needed to give this project a lead, Dr Saraswat said.

"The most important thing is to gain the confidence of airlines, because airlines are commercial entities. They want minimum operating cost, with maximum comfort to the user. Of course price is one of the major criteria. So when we design now, we will cater for all this," Saraswat said.

"But we would like certain level of assurance from government in terms of preferential access of market for indigenously-developed planes. At least government-owned airlines must prefer the indigenous aircraft over others," he said, adding that even private airlines must have a certain level of acceptance.

Since the LCA development has also brought in serious private participation with many companies manufacturing different parts of the fighter, there is already a good private-industry eco-system that will ensure that design and development won't take much time. For the LCA, many parts and sub-systems are now made by private companies like L&T.

"Today with so many industries participating in LCA, they are now ready. They have learnt their lesson... and they also know they will have greater opportunity with production of an indigenous passenger plane," Dr Harinarayana said.

International collaborators are also on board to ensure there is a good market for the plane in due course, he added.

<https://www.news18.com/news/india/after-giving-india-its-first-self-made-fighter-jet-tejas-team-to-steer-own-passenger-plane-dream-2044511.html>