

Will indigenously designed Arjun Mk-1A be a game-changer in armoured warfare?

The tank has been designed by the scientists of Combat Vehicles Research and Development Establishment (CVRDE), a state-owned DRDO laboratory

By Ashish Shukla

India's most lethal all-weather tank manufactured with cutting edge technology - Arjun 'Mk-1A' - main battle tank has cleared the final hurdle after successful completion of the final integration tests.

Earlier this year, the armoured corps of the Indian Army had cleared India's next-generation tank. It is one of the most awaited attractions of the 11th biennial edition of DefExpo India 2020, which is scheduled to be held in Lucknow. The tank, a 68-tonne rugged bull, is being indigenously manufactured by the Defence Research and Development Organisation (DRDO).

Notably, Arjun Mk-1A is an enhanced version of Arjun Mk-1 that is already in service with two regiments in the Army.

As reported by the New Indian Express, the tank has been designed by the scientists of Combat Vehicles Research and Development Establishment (CVRDE), a laboratory of state-owned DRDO. Now, with the final go-ahead signal from the army, it is ready to be manufactured on a large scale at the Heavy Vehicles Factory (HVF) in Avadi.

What are the major improvements in Arjun?

The officials of DRDO have said that in comparison to its earlier variant, Arjun Mk-1A has undergone 72 improvements, of which 14 were the major upgrades directly requested by the Indian Army. CVRDE Director V Balamurugan said that the basic parameter of the tank includes "firepower, protection and mobility".

Under firepower, CVRDE has included four major upgrades with an improved Gunner's Main Sight (GMS), integrated with Automatic Target Tracking (ATT), that help the tank crew fire while the tank is in motion. Moreover, the Commander's Panoramic Sight (CPS Mk II) has been integrated with Thermal Imager.

The upgrade would mean that the tank commander would be able to effectively conduct surveillance during daytime as well as in the dark. The tank is also now loaded with a Remote Controlled Weapon Station that will allow the loader to engage with the ground targets and aerial targets from the protective envelope of the tank armour.

In terms of protecting the tank crew, the vehicle has Track Width Mine Plough (TWMP) which means it can cross minefields without any hindrance as the minesweeper would easily create a mine-free path.

One of the most striking features of this tank would be the protection against chemical attacks. A special sensor has been loaded on the tank which detects the presence of harmful toxic chemicals in the atmosphere around the tank.

One of the CVRDE officials said, "The sensor detects the harmful chemicals, triggers an alarm and the Nuclear Chemical warfare system increases the pressure in the tank compartment to a little higher than in the atmosphere thus preventing toxic air from entering the tank. The tank crew get air through a particulate filter for their survival."

<https://www.ibtimes.co.in/will-indigenously-designed-arjun-mk-1a-be-game-changer-armoured-warfare-810010#>

Metal-cutting for single-engine Tejas fighter planes to begin in February

The Tejas (Mk-II) are slated to replace the existing French-made Mirage -2000 and Russian -made MiG-29 class of fighters

By Sudhi Ranjan Sen

New Delhi: Metal cutting, the first step in the start of commercial production, of the of indigenously made single-engine fighter plane Tejas (Mk-II) is scheduled for February 2020, according to Dr Girsh S Deodhare, director of the Aeronautical Development Agency (ADA) and head of the Tejas programme.

The Mk-II will have more advanced sensors including a powerful radar, empowering the fighter for operations beyond the visual range, and improved avionics. The fighter will be able to fly with more weapons and fuel than its predecessors Mk-1 and Mk-1A.

The IAF is buying 123 Mk-1 and Mk-II fighters. The Tejas Mk-II will be several tons heavier and is designed to fit into the medium weight categories of fighters.

Recently the IAF told the government that it is ready to buy more indigenous fighters to replace its aging fighter fleet.

The Tejas (Mk-II) are slated to replace the existing French-made Mirage -2000 and Russian -made MiG-29 class of fighters.

“The detailed designing stage is over; drawings are frozen,” Dr Deodhare said.

Both the Indian Air Force (IAF) and the Defence Research and Development Organisation (DRDO) are looking at the Tejas as a replacement for the the French-made Mirage-2000 class of fighters, around a dozen of which were pressed into action on February 26 to bomb a Jaish-e-Mohammed terrorist camp in Balakot, Pakistan, in reprisal for the February 14 terrorist attack in Pulwama that killed 40 Central Reserve Police Force (CRPF) troopers.

The prototype of the Tejas (Mk-II) is expected to be flying in about two years. The metal cutting will take about a year to 18 months. Tejas Mk -II, which will be fitted with a GE-414 engine, is scheduled to make its first flight in 2024. .

The DRDO has been criticized and even ridiculed for slow progress made in key military programmes, especially the Tejas light combat aircraft (LCA) programme, which has taken about a decade-and-a-half to mature. Nonetheless, the Tejas has the unique distinction of not being involved in a single crash or accident till date despite hundreds of hours of flying.

Using learnings from the past and in an effort to shorten the manufacturing and maintenance process, the DRDO has decided to build the Tejas (Mk-II) in a modular fashion and plans to lean on the private sector more than it did in the past.

Modular construction, where components like the fuselage, wings and landing gear area built separately but are put together in the final assembly line, increases the speed of construction and shortens delivery time. Modular construction requires detail exacting design of each component and



allows more than one unit to be involved in the production process. It also helps maintenance and reduces time between sorties. Components can be changed easily by replacing a module making the fighter easily serviceable. A major complaint against the initial batch of Tejas fighters was that they weren't designed in a modular fashion increasing maintenance and turn-around time.

Interestingly, the DRDO is also working on an "optimally manned" cockpit technology for the LCA and the next-generation Advanced Medium Combat Aircraft (AMCA).

The cockpit technology will help regain control of the aircraft in case the pilot loses consciousness or is incapacitated. A helmet-mounted sensor will alert ground control, which will be able to take over the aircraft's controls to safely land the aircraft. "It is an artificial intelligence-based application. Till now we were following (the west), now we want to take the lead," Dr Deodhare said.

"Metal Cutting of the Tejas (Mk-II) is a very important development. The ADA and DRDO must ensure that going forward they should hand-hold private sector. Also I must underline that both the airforce and DRDO must sort out power and thrust requirements or in short what kind of engine is being used from the very beginning. On the whole it is very positive and crucial development for the fighter programme," Air Marshal S J Nanodkar said when asked about the metal-cutting for the Tejas (Mk-II).

<https://www.hindustantimes.com/india-news/metal-cutting-job-for-tejas-to-begin-in-feb/story-wyYM6Iwz0HsC1XHkDUIX3K.html>

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Philippines likely to finalise BrahMos deal by next year

India has been in talks with several countries, including Thailand, Indonesia and Vietnam, over the past few years to sell them land and sea-based versions of the supersonic cruise missile

By Rezaul H Laskar

New Delhi: The Philippines is set to become the first country to buy the BrahMos cruise missile jointly developed by India and Russia, with New Delhi and Manila focusing on price negotiations with the aim of concluding a deal in 2020, people familiar with the discussions said.

India has been in talks with several countries, including Thailand, Indonesia and Vietnam, over the past few years to sell them land and sea-based versions of the supersonic cruise missile.

The people cited above said the Philippines Army had zeroed in on the BrahMos after extensive trials and everything now revolved around the cost of the system and financing for the deal.



"As far as the Philippines Army is concerned, the consensus on the BrahMos system is a done deal. Now, it's all about the price negotiations and we hope the deal will be finalised next year," said a person familiar with the negotiations who declined to be named.

The cost of the system will be the key factor in Manila's decision on the number of units to be purchased to equip the Philippines Army's first Land Based Missile System Battery, which was raised and activated in October, the people said.

Though India has offered a \$100 million line of credit to the Philippines for defence purchases, Manila is exploring the option of acquiring the BrahMos system with its own funds to be allocated in the next budget.

"Various options are being looked at – whether it should be internal funding or a preferential loan – and whether there will be some preferential terms offered for the sale. The cost will determine how many systems are bought," said the person cited above.

The Philippines Army's decision to opt for the BrahMos became evident when a mock-up of the land-based version of the missile was displayed at an expo in Manila on December 5. The missile was displayed mounted on a truck launcher system and a chart outlined the Philippines Army's development road map for the first Land Based Missile System Battery.

The chart said the battery had been activated and its personnel would undergo special courses on rockets, missiles and training simulators to be prepared for inducting the missiles. The chart also said: "Equipment: For acquisition of LBMS (BRAHMOS)."

The chart showed the Philippines Army expects the battery's personnel and equipment to be ready and for all the equipment to be acquired by 2024.

It also showed the army expects the battery to be fully capable of defending the Philippines against external threats by 2028.

In recent years, the Philippines has concluded several deals with India for personal protective items or bulletproof gear and armour plating for military vehicles.

An Indian firm has also bid for a recent Philippines tender for bulletproof gear.

During Prime Minister Narendra Modi's visit to the Philippines in 2017, the two sides signed an MoU on defence industry and logistics cooperation to provide a framework for strengthening cooperation and coordination in logistics support and services, and in the development, production and procurement of defence hardware.

In July, Thailand ambassador Chutintorn Gongsakdi had told HT his country was hoping to conclude negotiations on the purchase of the BrahMos missile by next year. He said Thailand is eyeing "important purchases" of Indian military hardware, including coastal radars and the BrahMos.

India is also exploring the possibility of selling the BrahMos to Indonesia, and a team from the Indo-Russian joint venture that makes the system visited a state-run shipyard in Surabaya in 2018 to assess the fitting of the missile on Indonesian warships.

Talks have also been held with Vietnam for the sale of the BrahMos, which was developed by the Indo-Russian joint venture set up in 1998. The Indian Navy inducted the missile on its frontline warships in 2005 and the army began inducting the BrahMos from 2007 after a series of tests.

<https://www.hindustantimes.com/india-news/philippines-likely-to-finalise-brahmos-deal-by-next-year/story-pzQe35AYmpvKKByglm4osL.html>