THE ASIAN AGE

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India's BrahMos cruise missile flies farther, faster than others

The name is derived from India's Brahmaputra and Russia's Moskva rivers

By Anil Bhat

In 1998, India signed an agreement with Russia to design, develop, manufacture and market BrahMos, a supersonic cruise missile system jointly developed by India's Defence Research and Development Organisation (DRDO) and Russia's NPOM, launchable from land, aircraft, ships and submarines. BrahMos is a modification of Soviet-era anti-ship missiles (Oniks, Yakont) developed by the Reutov Design Bureau in the late 1980s. The name is derived from India's Brahmaputra and Russia's Moskva rivers. The first test launch was conducted on June 12, 2001, at the Chandipur range in Odisha, India, and subsequently, the production of missiles began at enterprises in both countries.

Development of these cruise missiles is a natural progression for India, in seeking to develop various platforms for its military arsenal, either on its own or with a partner — but nevertheless, in India, and thus it became the first Make in India venture. BrahMos is technically a ramjet-powered supersonic cruise missile with a solid propellant booster that can be launched from land-based canisters, submarines, ships and now aircraft. Travelling at speeds of Mach 2.8 to 3.0, it is the world's fastest cruise missile, about three-and-a-half times faster than the American subsonic Harpoon cruise missile. Since its maiden successful test firing conducted on June 12, 2001, BrahMos has undergone a record number of over 70 flight tests to date from land, sea, sub-sea and air platforms, thereby validating its multifarious capability to completely annihilate high-value ground and sea-based targets with ultimate speed, pin-point accuracy and devastating firepower in all weather conditions by day and night. One of its special features is its ability to fly extremely close to the ground to avoid missile defence systems. In fact, during the terminal phase, the missile can fly as low as 10 m to the ground. In the final phase, the missile relies on an active radar seeker or inertial guidance.

While the Indian Army deployed the land-attack BrahMos (LACM) variant since 2007, the Indian Navy inducted the versatile weapon in both surface to air and anti-ship configurations onboard its frontline surface warfare platforms since 2005. The Indian Air Force (IAF) has also raised a land-attack BrahMos squadron and successfully test-fired the advanced air-launched version of the weapon (ALCM) for the very first time from its frontline Sukhoi-30MKI strike fighter against a sea-surface target on November 22, 2017, thereby creating history and making India the first and only country in the world to complete the "supersonic cruise missile triad". In this test, the IAF successfully fired the BrahMos-A in an anti-shipping configuration off the eastern coast in the Bay of Bengal. The launch was smooth; it fell for about 100 to 150 m, ignited and followed the desired trajectory, before directly hitting the target ship. This only succeeded with dedicated support from the Indian Navy, by way of ensuring availability of the targets and a large number of monitoring ships to ensure data collection and range safety clearance.

BrahMos Aerospace became the first defence entity in the world to integrate and flight test the heaviest air-borne weapon onto a super-manoeuvrable fighter platform. In 2019, the missile underwent a number of successful test firings from land, sea and air platforms. The IAF conducted a second successful test firing of the advanced BrahMos air-launched cruise missile (ALCM) on May 22, 2019 against a land target in the Andaman & Nicobar Island region.

In July 2019, CEO, BrahMos Aerospace, Sudhir Kumar Mishra, announced, “India has successfully test-fired a vertical deep dive version of BrahMos, the world’s fastest supersonic cruise missile, that can now change the dynamics of conventional warfare... The upgraded version of the missile with enhanced range of up to 500 km is also ready… We can take on any ship at sea up to 300 to 400 km (far) and after some time, may be longer; we can take on land targets up to hundreds of kilometers and with the test that we have conducted some time back (from Sukhoi 30), ranges up to thousands of kilometers. He also informed that (a) it is possible to increase the range of this missile because India is a part of the elite Missile Technology Control Regime (MTCR), (b) for the Army, Navy and Air Force, it has become a weapon of choice and (c) the steep 90-degree version has become an ultimate aircraft carrier killer.

The BrahMos anti-ship version was launched successfully in November 2019 from an Indian Navy platform. On December 17, 2019, BrahMos-A was tested yet again from the Su-30 fighter in “user configuration” against a ship target and successfully met all mission objectives. In December 2019, two successful major tests of the missile — one from a Sukhoi Su-30MKI fighter aircraft against a sea target, and another fired from a land-based mobile launcher against an unidentified target. On January 20, 2020, the IAF commissioned the “Tigersharks” squadron of Su-30MKI fighters armed with the deadly BrahMos air-launched missile at the Thanjavur air base in Tamil Nadu. This will be a vital asset to keep a “strategic eye” over the Indian Ocean region and enhance India’s protection and deterrent capability.

Sharing an important design/production aspect with this author, BrahMos Aerospace general manager and marketing director Praveen Pathak said, “The air-launched variant had to be made 500 kg lighter than the land/naval variants. One of the major challenges DRDO scientists had to overcome was the optimisation of transfer-alignment inertial sensors. Thankfully, the experience of the IAF flight test crew and the dedicated and synergetic efforts of the IAF, DRDO and HAL (Hindustan Aeronautics Limited) ensured that the integration was smooth. Altogether, it has proven India’s ability to undertake such complex integrations on its own.”

Reportedly, three BrahMos missile regiments raised so far have been deployed in the western sector to counter threats from Pakistan and in the second phase of military expansion along the China front, the government reportedly gave the go-ahead for deployment of BrahMos cruise missiles in Arunachal Pradesh. The fourth regiment of cruise missiles, with a 290-km range, will improve India’s military reach into the Tibet Autonomous Region and counter China’s elaborate missile deployment along the Sino-Indian Line of Actual Control.

Emerging as a top product in the international cruise missile market, the demand for this powerful weapon is growing with several countries across continents expressing strong interest in acquiring the missile for their militaries. Speaking at the IMDEX Asia 2019 exhibition held on May 2019, Commodore S.K. Iyer, chief general manager for HR at BrahMos Aerospace, said the first missile export contract awaited a government-to-government approval. “A number of Southeast Asian countries are ready to buy our missiles... It will be our first export and we have received increasing interests in the missiles form Gulf countries,” he said. BrahMos Aerospace is eyeing more successes for the joint venture in 2020, especially in getting a go-ahead from the government for exporting the missile to friendly, responsible nations. The Indian defence sector sees good opportunities for exports to the Southeast Asian and the Gulf countries where slower economic growth rates have put budgetary pressure on acquiring viable, cost-effective and reliable solutions.

There is a plan for the not too distant future to develop a hypersonic variant of the BrahMos missile which will travel at speeds faster than Mach 5.0.

(The writer, a retired Army officer, is a defence and security analyst based in New Delhi)

http://www.asianage.com/india/all-india/040220/indias-brahmos-cruise-missile-flies-farther-faster-than-others.html

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HAL plans to outsource 35% of LCA manufacturing to private sector

The leading aeronautical firm is in line to bag a contract to manufacture 83 of the LCA Mk 1A fighters — to be equipped with advanced radars, sensors and indigenous weaponry — and is doubling its annual production capacity to meet the requirement

By Manu Pubby

New Delhi: Gearing up for its biggest order yet under the Make in India initiative, state owned Hindustan Aeronautics Limited (HAL) plans to outsource a significant part of the estimated Rs 38,000 crore contract to the private sector.

The leading aeronautical firm is in line to bag a contract to manufacture 83 of the LCA Mk 1A fighters — to be equipped with advanced radars, sensors and indigenous weaponry — and is doubling its annual production capacity to meet the requirement.

HAL Chairman R Madhavan told ET that the first of the upgraded fighters can be delivered within three years of the order being placed and a significant amount of manufacturing will go to private sector companies such as Larsen and Toubro, Dynamatics, VEM Technologies and Alpha Design "We have planned that four vendors will supply major parts of the fuselage for the fighters. With regard to the manufacturing part, we plan to outsource almost 35% to the private sector," said Madhavan.

Several other Indian vendors will also be involved in the project, he said.

HAL has put in place the infrastructure to double its capacity to produce 16 of the fighter jets every year and has a contingency plan to increase it further if the need arises. "The second (production) line has been set up. With two lines we can manage 16 a year and if really required we can put up a third line as well," said Madhavan.

https://economictimes.indiatimes.com/news/defence/hal-plans-to-outsource-35-of-lca-manufacturing-to-private-sector/articleshow/73922517.cms

THE NATIONAL INTEREST

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Why India's Army hates its homemade Arjun Tank

What a mess

By Kyle Mizokami

- ***Key point: The Arjun was supposed to be a wonderful new weapon. However, it ended up being poorly made, over budget, and greatly delayed***

In the mid-1970s, India began development on a totally new, advanced main battle tank that would satisfy the needs of the country's Armored Corps. An impressive combination of firepower, armor protection and mobility, the tank was to be India's first indigenously produced tank—and one of the best in the world. The service date for the tank, known as Arjun, was confidently set for 1985.

Instead, the Arjun suffered a tortuously long development period spanning two centuries. The final result, introduced into the army twenty-six years later than originally planned, is a mess of a tank that not even the Indian Army wants.

The Indian Army's Armored Corps has been in existence for seventy-four years, tracing its roots to the Second World War, and has fought in every one of India's wars with neighbor and rival Pakistan. The Corps has across has sixty-three armored regiments (the equivalent of battalions), spread across eight armored and mechanized divisions and another seven armored and mechanized brigades.

The decision to produce an indigenous Indian tank was made in 1972, shortly after the Indo-Pakistani War of 1971. In 1974, the state-run Defence Research and Development Organisation (DRDO) was tasked with developing the tank. It was to be a forty-ton vehicle, armed with a 105-millimeter gun. It would be small enough to be strategically mobile, capable of being shuttled on internal lines (roads and railroads) to vital sectors along the long border with Pakistan.

DRDO decided to make the tank, called Arjun, a mostly Indian design. The Combat Vehicles Research and Development Establishment, part of DRDO, was to design the hull, armor, turret, gun and running gear. The main gun and engine would be imported. Unfortunately, India's defense-industrial base was nowhere near capable of creating such a vehicle. As if that weren't enough of an obstacle, India's world-famous bureaucracy and red-tape machine was another enemy to progress.

Today, the Arjun Mk 1 is a sixty-two-ton tank, complete with a 120-millimeter gun, advanced composite armor, a 1,400-horsepower turbocharged engine, and advanced fire control and thermal sights. Although the tank's specifications are impressive, the actual product leaves a lot to be desired.

By 2009, thirty-five years after it was originally conceived, Arjun was "ready" for production. Despite shortcomings revealed in testing, the Indian Army was forced to buy 124 Arjuns—enough to equip just two armored regiments—to keep state tank production facilities open. By mid-2015, two years after the purchase was complete, nearly 75 percent of the Arjun force was inoperable due to technical problems.

Arjun's armored protection evolved significantly over thirty-five years. The tank is fitted with Kanchan armor, a locally designed composite blend that is allegedly similar to British Chobham armor. Kanchan is rumored to be capable of shrugging off point-blank shots from the 125-millimeter gun of Indian T-72 tanks. Arjun is so well protected that its weight ballooned from the original forty-ton specification to sixty-two tons.

This increase in protection came at a cost—decreased tactical and operational mobility. As originally specified, a forty-ton tank with a 1,400-horsepower engine would have an impressive 35-to-1 horsepower-to-weight ratio. Unfortunately, Arjun's weight ballooned from forty to sixty-two tons, with no corresponding increase in engine power. DRDO finally settled on a German-made MTU 1,400-horsepower water-cooled diesel engine, complemented with an Indian supercharger. Arjun's horsepower-to-weight ratio sank to a mediocre 22.5 to 1. The vehicle's weight also means it cannot be used in Punjab and the northern deserts of India in India's "Cold Start" offensive strategy against Pakistan.

The Arjun's development period was so long that major design decisions became completely obsolete. The 105-millimeter gun, perfectly adequate in the 1970s when stacked up against the NATO-standard 105-millimeter L7 gun (the M68 in U.S. Army service), and the 115-millimeter gun of the Soviet T-62 tank, were obsolete by the early 1990s.

In the end, the Arjun ended up with a 120-millimeter rifled barrel gun, capable of firing High Explosive, Armor-Piercing Discarding Sabot rounds, High Explosive Anti-Tank rounds and, perhaps not unusually for a former British colony, High Explosive, Squash Head rounds. DRDO conducted test firings of the Israeli-made LAHAT long-range antitank missile, which offered a high probability of kill against armored vehicles out to six thousand meters, but the round was dropped in 2014. DRDO claims it will develop an indigenous equivalent.

How did Arjun, which took decades to develop, end up being such a disappointment? The tank took so long to develop that technologies not even invented when Arjun was first proposed had to be added to the tank. GPS navigation, laser warning receivers, non-explosive-reactive armor and other innovations were merely research papers in 1974, but by the early 2000s were must-have inventions that added to the tank's complexity, weight and cost.

The inability of DRDO to put its foot down and admit that it could not build the tank on time and on schedule doomed the tank. India's state of the military art was such that a new tank would out of necessity face a prolonged development time. The more the tank project dragged on, the more the tank needed to be redesigned to incorporate new technologies. The tank was trapped for decades in a development death spiral, and the end product is correspondingly mediocre.

DRDO is busy at work designing Arjun Mk II, which will allegedly contain many improvements over the original Mk I. The Indian Army for its part is adamant it wants no part of the Mk II until prototypes perform satisfactorily, and would much rather buy an overseas tank. The army, for now prefers the Russian T-90 tank and may express interest in the brand new T-14 Armata tank. Russian state media has reported that India is interested in the Armata as the basis of a new, localized tank. Whether that's true remains to be seen.

https://nationalinterest.org/blog/buzz/why-indias-army-hates-its-homemade-arjun-tank-119911