BRAHMOS Supersonic Cruise Missile

BRAHMOS is a two-stage missile with a solid propellant booster engine as its first stage which brings it to supersonic speed and then gets separated. The liquid ramjet or the second stage then takes the missile closer to 3 Mach speed in cruise phase. Stealth technology and guidance system with advanced embedded software provides the missile with special features.

The missile has flight range of up to 290-km with supersonic speed all through the flight, leading to shorter flight time, consequently ensuring lower dispersion of targets, quicker engagement time and non-interception by any known weapon system in the world.

It operates on 'Fire and Forget Principle', adopting varieties of flights on its way to the target. Its destructive power is enhanced due to large kinetic energy on impact. Its cruising altitude could be up to 15 km and terminal altitude is as low as 10 meters. It carries a conventional warhead weighing 200 to 300 kgs.

Compared to existing state-of-the-art subsonic cruise missiles, BRAHMOS has:

- 3 times more velocity
- 2.5 to 3 times more flight range
- 3 to 4 times more seeker range
- 9 times more kinetic energy

The missile has identical configuration for land, sea and sub-sea platforms and uses a Transport Launch Canister (TLC) for transportation, storage and launch.

Special Features

- Universal for multiple platforms
- "Fire and Forget" principle of operation
- High supersonic speed all through the flight
- Long flight range with varieties of flight trajectories
- Low radar signature
- Shorter flight times leading to lower target dispersion and quicker engagement
- Pin point accuracy with high lethal power aided by large kinetic energy on impact

Status

BRAHMOS is the first supersonic cruise missile known to be in service. Induction of the first version of BRAHMOS Weapon Complex (N1) in the Indian Navy commenced from 2005 with INS Rajput as the first ship. All future ships being built and ships coming for mid-life upgradation will be fitted with the missile.

The Indian Army has also received the first regiment of BRAHMOS missile, Block I (A1), with the formation of N816 missile regiments and commencement of deliveries from 2007.

In Service

- Ship based Weapon Complex (Inclined & Vertical Configuration)
- Land based Weapon Complex (Vertical Launch Configuration from Mobile Autonomous Launcher)

In Progress

- Air launch version
- Submarine launch version

The cannisterised missile is capable of being launched vertically from underwater state and will be tested soon from a submerged platform. Deployment depends on the requirement of the Indian Navy or navies of friendly countries.

The air launched version has been developed and has lesser weight and additional rear fins for aerodynamic stability during separation from the aircraft and launch. The missile has gone through complete cycle of ground trials. The required modifications in SU-30 MKI for interface with the missile

launcher and integration with the weapon control of the aircraft are being carried out together with Indian Air Force and Sukhoi Design Bureau. The air-trials will commence in 2010 with deployment in Indian Air Force by 2012.

Source: Brahmos Aerospace Website, http://www.brahmos.com/content.php?id=10&sid=10

BRAHMOS cruise missile test-fired

Indian Express, September 6, 2010

Adding a new feather to India's missile prowess, 290-km range BrahMos cruise missile was on September 5, successfully test-fired as part of trials by the Army from the Integrated Test Range (ITR) at Chandipur off the Orissa coast.

"User's trial of BrahMos conducted by the Indian Army was successful," ITR director S P Dash said after the missile blasted off from a mobile launcher at around 11:35 am from the launch complex-3 of the test range near here.

The trial was conducted for achieving the maximum range of 290 km of the supersonic missile, he said. The missile can fly at 2.8 times the speed of sound carrying conventional warheads up to 300 kg for a range of 290 km and can effectively engage ground targets from an altitude as low as 10 metres.

Developed in a joint venture with Russia, the sophisticated BrahMos cruise missile is capable of being launched from submarines, ships, aircraft and land-based Mobile Autonomous Launchers (MAL), a Defence Research Development Organisation (DRDO) official said. One regiment of the 290-km range BrahMos-I variant, consisting of 67 missiles, five mobile autonomous launchers on 12x12 Tatra vehicles and two mobile command posts, among other equipment, is already operational in the Army.

Similarly, the Navy has started inducting the first version of BrahMos missile system in all its frontline warships from 2005, defence sources said. The Army, on its part, is set to induct two more regiments of the BrahMos Block-II land-attack cruise missiles (LACM), designed as "precision strike weapons" capable of hitting small targets in cluttered urban environments, they said.

BrahMos-II can potentially be used for "surgical strikes", including at terrorist training camps, without causing collateral damage. BrahMos Block-II variant has been developed to take out a specific small target, with a low radar cross-section, in a multi-target environment. The BrahMos missile is a

two-stage vehicle that has a solid propellant booster and a liquid propellant ram-jet system.

The first flight test of the BrahMos was conducted on June 12, 2001 at the ITR at Chandipur in Orissa coast and the last trial of the naval version of BrahMos was carried out in a vertical mode successfully on March 21, 2010 from Indian navy ship INS Ranvir off the Orissa coast.

Source: http://www.indianexpress.com/news/brahmos-cruise-missile-testfired/677699/2