Hypersonic technology demonstrator vehicle

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Hypersonic technology demonstrator vehicle (HSTDV) of DRDO

Recently Defence Research and Development Organisation (DRDO) launched a Hypersonic Technology Demonstrator Vehicle **to prove a number of critical technologies for futuristic missions** from Dr Abdul Kalam Island off the coast of Odisha.

Key Highlights of the Launch

- The maiden launch of an indigenously-developed hypersonic technology demonstrator vehicle (HSTDV), powered by a scramjet engine, from the Dr Abdul Kalam Island off the Odisha coast failed to achieve the technical parameters laid down for the test

Why Failed?

Defence sources said that the HSTDV, designed to cruise at Mach 6 speed with the scramjet engine, was supposed to "fire and fly on its own" after being carried to an altitude of around 30-40 km by the solid rocket motor of an Agni-I ballistic missile in the test.

But the Agni-I booster went into an uncontrolled mode after the launch and could not achieve the desired altitude hence the entire test flopped.

The cruise vehicle (HSTDV) was supposed to be ejected out of the launch vehicle (Agni-I) and be propelled by the scramjet engine after it auto-ignited at the required altitude but it failed to do so during the test. The test was considered critical for the development of a hypersonic (over Mach 5 speeds) cruise missile system in the future.

Aim of the HSTDV project

The HSTDV project is basically aimed at demonstrating autonomous flight of a scramjet integrated vehicle using kerosene, which can have multiple civilian applications, including launching satellites at a low-cost, as well as military uses in the shape of long-range cruise missiles.

Scramjet Vs Ramjet

A scramjet engine is an improvement over the ramjet engine because the former operates efficiently at hypersonic speeds and allows supersonic combustion. Ramjets, in contrast, operate well at supersonic speeds around Mach 3 but their efficiency drops at hypersonic speeds.