

National Aerospace Initiative Supersonic Turbine Powered Engine

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ABSTRACT:

NASA, in conjunction with the United States Security Council, the Office of the Secretary of Defense, and the Chief of Naval Operations, is conducting a broad study concerning supersonic turbine powered engines. From high-speed (Mach 3-4) and Hypersonic missiles to rapid strike aircraft and hypersonic cruise vehicles, NASA sees hope for application of the engine in various fields. Specifically, the military is looking for a traceable weapon capable of speeds of Mach 3.5 with a range of 350 nautical miles as well as payload and platform (air-launched and VLS-launched) flexibility in order to penetrate deep into enemy territory.

NASA is also looking to meet National Aerospace Initiative (NAI) by providing a low cost knowledge stepping stone critical to all NAI roadmap programs. NASA intends to provide a flight demonstration by FY06 of the supersonic accelerator turbine, the blended body configuration, inlet/engine/nozzle integration along with three demo flight tests.

The USMA study focused on the investigation of long range time-critical strike (missile-type) mission/vehicle trades. This included addressing gross mission parameters (range and time-to-target) and gross vehicle parameters using Breguet Range (aero L/D, weight, breakdown, acceleration rate). The study also focused on assessing mission/vehicle trade impacts on the propulsion system performance (fuel consumption, thrust, thrust/airflow).