



News Release

Defense Advanced Research Projects Agency

3701 North Fairfax Drive
Arlington, VA 22203-1714

IMMEDIATE RELEASE

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DARPA Announces Phase II of its Vulcan Program DoD closer to achieving fuel cost savings

The Defense Department is considered to be the largest single user of petroleum products in the world. To help meet a DoD goal to reduce energy consumption across the agency, the Defense Advanced Research Projects Agency (DARPA) is working on Vulcan, a program to design, build and demonstrate a full-scale constant volume combustion (CVC) power generation turbine engine. CVC technologies have the potential to significantly decrease the fuel consumption of gas turbine engines. Application of this technology is expected to reduce turbine fuel consumption by 20 percent, resulting in a savings of approximately 65 gallons per hour compared to existing DDG-51 Class gas turbine generator sets.

Phase II of Vulcan, just underway, focuses on inserting CVC into 3 to 5 megawatt class turbines similar to those used on U.S. Navy surface combatants to reduce fuel consumption, airflow and provide increased capability. This is a two year effort which plans to mature the Vulcan engine design, conduct risk reduction of the Vulcan engine, CVC module and associated components, and conduct key Phase II rig tests. This approach will provide demonstration tests of key components and subsystems that provide the proof of concept to enable the design and test of a turbine engine in Phase III.

During Phase I, DARPA explored the development of CVC concepts, detailed technology development plans and improved modeling techniques. A business case analysis of CVC engine applications was also completed. This study evaluated the cost and benefits of applying CVC engine technology to marine markets and explored the possibilities associated with extending this application to future aviation, commercial and industrial markets. Results of the analysis showed that integrating CVC technology into ship-based power gas turbines using a hybrid approach results in fuel savings with potential payback of retrofit cost within three years.

DARPA selected General Electric Aviation and Pratt and Whitney as Phase II performers for this two year program. DARPA is also working with a government team led by the Air Force Research Laboratory and including the Naval Post Graduate School, Naval Research Laboratory and the National Aeronautics and Space Administration to explore high risk technology development. The Naval Surface Warfare Center Carderock Division is also being funded to identify module and ship-level characteristics, benefits and impacts associated with the application of CVC technology.

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Media with inquiries, contact Eric Mazzacone, (703) 526-4758 or eric.mazzacone@darpa.mil