Proton-Exchange-Membrane Fuel Cell Tested at Glenn

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A significant milestone in technology development for space exploration applications will be achieved with the testing of a Proton-Exchange-Membrane Fuel Cell (PEMFC) engineering model power plant.
The engineering model is being performance tested in a new state-of-the-art fuel cell test facility at NASA's Glenn Research Center. The facility, capable of testing various fuel cell types of 1 kW to 125 kW power, brings to NASA new and unique capabilities for the evaluation of fuel cells for future missions.

The PEMFC is an electrochemical power generation device that converts hydrogen and oxygen reactants into electrical power, heat and water. Because the hydrogen and oxygen can be shared with propulsion systems and the water can be shared with crew life-support systems, fuel cells are an attractive primary power source for human space missions.

When fuel cells are coupled with an electrolyzer to form a regenerative fuel cell system (RFC), the technology becomes an attractive energy storage alternative to battery systems, especially for lunar missions where the day-night cycles are much longer than those in low Earth orbit.

"Proton-Exchange-Membrane Fuel Cells, as either a primary power source or part of a regenerative fuel cell energy storage system, are proving to be a leading technology for NASA Exploration missions," said Glenn Fuel Cell Technology Manager Mark Hoberecht.

Upon completion of the testing at Glenn, the engineering model will undergo vibration and thermal vacuum testing at NASA's Johnson Space Center in Houston. At the conclusion of the test program, NASA will have demonstrated in a simulated flight environment that the technology is ready for application consideration in future space missions.

The engineering model was designed and built under contract by Teledyne Energy Systems, Inc. and delivered in late July. It will be the first high-fidelity 12-kilowatt PEMFC hardware for space applications evaluated in a spaceflight-like environment.

Source: NASA

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