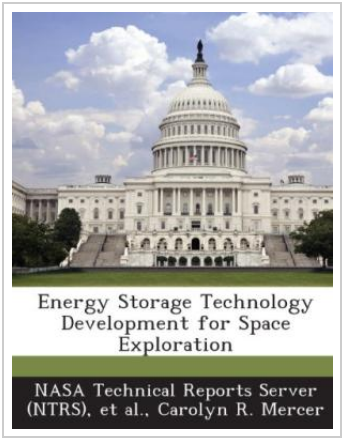

Energy Storage Technology Development for Space Exploration

By Carolyn R. Mercer

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 22 pages. Dimensions: 9.7in. x 7.4in. x 0.1in.The National Aeronautics and Space Administration is developing battery and fuel cell technology to meet the expected energy storage needs of human exploration systems. Improving battery performance and safety for human missions enhances a number of exploration systems, including un-tethered extravehicular activity suits and transportation systems including landers and rovers. Similarly, improved fuel cell and electrolyzer systems can reduce mass and increase the reliability of electrical power, oxygen, and water generation for crewed vehicles, depots and outposts. To achieve this, NASA is developing non-flow-through proton-exchange-membrane fuel cell stacks, and electrolyzers coupled with low permeability membranes for high pressure operation. The primary advantage of this technology set is the reduction of ancillary parts in the balance-of-plant fewer pumps, separators and related components should result in fewer failure modes and hence a higher probability of achieving very reliable operation, and reduced parasitic power losses enable smaller reactant tanks and therefore systems with lower mass and volume. Key accomplishments over the past year include the fabrication and testing of several robust, small-scale non-flow-through fuel cell stacks that have demonstrated proof-of-concept. NASA is also developing...

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