



Energy Storage Project

NASA Technical Reports Server
(NTRS), et al., Carolyn R. Mercer

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Energy Storage Project (Paperback)

By Carolyn R Mercer

Bibliogov, United States, 2013. Paperback. Condition: New. Language: English . Brand New Book ***** Print on Demand *****.NASA's Exploration Technology Development Program funded the Energy Storage Project to develop battery and fuel cell technology to meet the expected energy storage needs of the Constellation Program for human exploration. Technology needs were determined by architecture studies and risk assessments conducted by the Constellation Program, focused on a mission for a long-duration lunar outpost. Critical energy storage needs were identified as batteries for EVA suits, surface mobility systems, and a lander ascent stage; fuel cells for the lander and mobility systems; and a regenerative fuel cell for surface power. To address these needs, the Energy Storage Project developed advanced lithium-ion battery technology, targeting cell-level safety and very high specific energy and energy density. Key accomplishments include the development of silicon composite anodes, lithiated-mixed-metal-oxide cathodes, low-flammability electrolytes, and cell-incorporated safety devices that promise to substantially improve battery performance while providing a high level of safety. The project also developed non-flow-through proton-exchange-membrane fuel cell stacks. 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...



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