

SPECIAL ISSUE

ENERGY STORAGE—PART I: BATTERIES AND ENERGY CONVERSION SYSTEMS

Edited by B. R. Chalamala, R. Guttromson, and R. D. Masiello

939 Lithium-Ion Battery Systems

By T. Horiba

|INVITED PAPER| This paper presents a comprehensive review of the state of the art of commercially available lithium-ion battery technologies with emphasis on energy storage applications.

951 Advanced Lead-Acid Batteries and the Development of Grid-Scale Energy Storage Systems

By B. B. McKeon, J. Furukawa, and S. Fenstermacher

|INVITED PAPER| This paper presents a summary of advances in lead-acid batteries and the deployment of energy storage systems utilizing advanced lead-acid batteries for renewable-energy and grid applications.

964 Regenerative Fuel Cells for Energy Storage

By G. L. Soloveichik

|INVITED PAPER| The paper reviews the development of regenerative fuel cells and the current status of hydrogen-based regenerative fuel cells for energy storage applications.

976 Redox Flow Batteries: An Engineering Perspective

By B. R. Chalamala, T. Soundappan, G. R. Fisher, M. R. Anstey, V. V. Viswanathan, and M. L. Perry

|INVITED PAPER| The authors review the development of redox-flow battery technology including recent advances in new redox-active materials, cell designs, and systems, from the perspective of engineers interested in applying this technology.

1000 Power Electronics for Grid-Scale Energy Storage

By B. M. Grainger, G. F. Reed, A. R. Sparacino, and P. T. Lewis

|INVITED PAPER| The authors discuss power electronic conversion systems and components for the interconnection of energy storage systems with the electric grid.

1014 Battery Energy Storage System (BESS) and Battery Management System (BMS) for Grid-Scale Applications

By M. T. Lawder, B. Suthar, P. W. C. Northrop, S. De, C. M. Hoff, O. Leitermann, M. L. Crow, S. Santhanagopalan, and V. R. Subramanian

|INVITED PAPER| This paper provides a comprehensive review of battery management systems for grid-scale energy storage applications.

DEPARTMENTS

930 POINT OF VIEW

Nanotechnology and Life: An Engineer's Perspective

By E. M. Bucci, O. M. Bucci, and R. Sorrentino

936 SCANNING THE ISSUE

Energy Storage—Part I: Batteries and Energy Conversion Systems

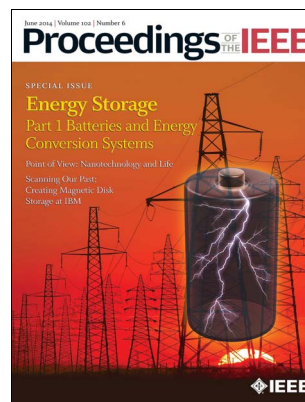
By B. R. Chalamala, R. Guttromson, and R. D. Masiello

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STARS: Creating Magnetic Disk Storage at IBM

By E. W. Pugh

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On the Cover: Our cover this month aptly captures the essence of this special issue's focus on batteries and power conversion systems.