

EESAT 2000 SESSIONS & TOPICS

OVERVIEW OF ENERGY STORAGE APPLICATIONS & TECHNOLOGIES

Capturing Value with Energy Storage in the Energy and Reserve Markets – Frank Graves, Thomas Jenkin, & Dean Murphy, The Brattle Group

What a "Good" Energy Storage System Would Look Like to a Large Utility – Allan Ingram, Bonneville Power Administration

IBERDROLA's Technology Demonstration Center, Novel Technological Projects Location – Jesus Garcia, Jose F. Moles, & Enrique Vega, IBERDROLA

MULTI-MEGA WATT APPLICATIONS

Recent Developments in the Design and Applications of a Utility-Scale Energy Storage Plant – Anthony Price & Barry Davidson, Innogy Technology Ventures

Advanced NAS Battery System – Akiyasu Okuno, Makoto Kamibayashi, & Kouji Tanaka, Tokyo Electric Power Co.

Update on the Golden Valley Electric Association BESS – Stan Sostrom, POWER Engineers

A Review of the Operation of a Large Scale, Demand Side Energy Management System Based on a Valve Regulated Lead-Acid Battery Energy Storage System
– George W. Hunt & Christopher B. John, GNB Technologies

LEAD-ACID BATTERY APPLICATIONS

Are Valve-Regulated Lead-Acid Batteries Reliable? An End-User Perspective
– Mindi Farber De Anda & Jennifer Dunleavey, Energetics

Examination of VRLA Battery Cells Sampled from the Metlakatla Battery Energy Storage System – Joseph Szyborski & George Hunt, GNB; Rudolf Jungst, Sandia National Laboratories

Online Impedance Testing of Storage Cells – Peter E. Langan, AVO International-Biddle Instrument Group

The Energy and Life Benefits of Charging Lead Acid Cells Individually by a Battery Management System – Charles E. Burns, AutoCap

SYSTEMS ANALYSIS

A National Initiative to Characterize Transmission Power Quality – Steven G. Whisenant, Duke Power

Intelligent Energy Distribution Networks through the Use of Innovative Decentralized Generation, Storage, Information and Communication Systems – Herbert Schmidt, Fraunhofer Institute for Solar Energy Systems; Gerhard Weissmueller, Stadtwerke Karlsruhe; Thomas Stephanblome & Erik Hennig, EUS; Dusan Povh, Siemens

Integration of Renewable Generation into the UK Market - Opportunities for Energy Storage – Graeme Bathurst, Goren Strbac, & Nick Jenkins, Manchester Centre for Electrical Energy

The Cost and Benefits of Electrical Energy Storage – Alan Collinson, EA Technology

Evaluation and Technology Review of Energy Storage for the PREPA System
– Agustin A. Irizarry-Rivera, University of Puerto Rico-Mayaguez; Wenceslao Torres & Efran Paredes, Puerto Rico Electric Power Authority

Data Management for Fielded Energy Storage Systems – Garth P. Corey & Paul C. Butler, Sandia National Laboratories; Mindi J. Farber-DeAnda, Energetics; Kurt W. Klunder, Sentech; Jeffrey D. Newmiller, Endecon Engineering; Benjamin L. Norris, Gridwise Engineering Company

APPLICATIONS OF FLYWHEELS AND SMES SYSTEMS

Recent Developments on micro-SMES System Project at the University of Bologna
– P. G. Albano, C. A. Borghi, M. Breschi, D. Casadei, A. Cristofolini, M. Fabbri, G. Grandi, P. La Cascia, F. Negrini, U. Reggiani, P. L. Ribani, C. Rossi, G. Serra, & A. Tani, University of Bologna

Development of a 1 kWh/1 MW Module-Type SMES – Hidemi Hayashi, Tsuneo Sannomiya, Hitoshi Kanetaka, Katsuya Tsutsumi, & Fujio Irie, Kyushu Electric Power; Maseru Tezuka, Toshiba Corporation; Katsuhiko Asano, Hitachi Ltd. Hitachi Works; Shinichi Nose, Fuji Electric R&D; and Hidemasa Yamamura, Kobe Steel

Development of Long-life, Low-maintenance Flywheel Electricity Systems
– A. C. Day & M. Strasik, Boeing Phantom Works; J. Wood, Jack Wood Associates; P. Taylor & L. C. Johnson, Energetics

Flywheel Energy Storage System with Superconducting Magnetic Bearing
– Makoto Hirose, Akio Yoshida, Hidetoshi Nasu, & Tatsumi Maeda, Shikoku Research Institute

Development of 1 kWh Flywheel Energy Storage System with Superconducting Magnetic Bearing – Naoji Kashima & Shigeo Nagaya, Chubu Electric Power; Masaharu Minami, Hiroshi Kawashima, & Shigeru Unisuga, Mitsubishi Heavy Industries

Active Filter with Integrated Flywheel – Rainer Harke, EUS; Martin Kleimaier, RWE Energie; Ulrich Kriegler, Piller; Martin Langer, TEAM

CUSTOMER APPLICATIONS

Energy Storage for Industrial Processes – Kim L. Craven, Duke Power; Roger Lawrence, RGLsolutions.com

Advanced Electrochemical Capacitors for ASD Ride-Through and UPS Power Conditioning Applications – Tom Geist, Rick Langley, & Arshad Mansoor, EPRI PEAC Corporation; Ben Banerjee, EPRI

Operation Experience with Magnetodynamic Flywheel Storage Systems in Public Transport Buses – Gerhard Reiner & Werner Weck, Magnet-Motor

Vanadium Redox Flow Battery System for Use in Office Buildings – Nobuyuki Tokuda, Yasutaka Miki, Hiroo Arai, & Kei-ichi Yamamoto, Kansai Electric Power; Katsuji Emura, Kenji Motoi, Tsuyoshi Shinzato, & Takashi Kanno, Sumitomo Electric Industries

Power Quality Evaluation of Mobile UPS Installation at S&C Electric Company – Ernst H. Camm & Brad Roberts, S&C Electric Company

APPLICATIONS USING LITHIUM BATTERY SYSTEMS

The Practical Application of Lithium Ion Batteries in Energy Storage and Other Stationary Applications – J. McDowall, S. Oweis, G. Laucournet, G. Chagnon, & T. Sack, Saft America

Characteristics of Lithium Secondary Batteries Developed as a part of the Japanese National Project for Electric Vehicle and Home-Use Load Leveling Systems – T. Iwahori, K. Takei, Y. Mita, H. Miyashiro, Y. Kobayashi, K. Kumai, K. Ishihara, & T. Tanaka, Central Research Institute of Electric Power Industry (CRIEPI)

Development of 250 Wh-class Long Life Lithium Secondary Batteries and 2 kWh-class Module using a Graphite-coke Hybrid Carbon Negative Electrode For Home-use Load-leveling Systems – Atsuhiko Funahashi, Katsunori Yanagida, Yoshinori Kida, Toshiyuki Nohma, & Ikuo Yonezu, SANYO Electric

UTILITY APPLICATIONS OF SODIUM SULFUR BATTERY SYSTEMS

Development of a 100kW NAS Battery-Based System for Combined Power Quality and Peak Shaving Applications – Norikazu Ichikawa, Kyushu Electric Power; Tomio Tamakoshi, NGK Insulators; Yoshisuke Watanabe, Kyushu Transformer

Pulse Power Performance of NAS Batteries for Combined Power Quality and Peak Shaving Applications – Kouji Tanaka, Tokyo Electric Power; Taku Oshima, & Hiroyuki Abe, NGK Insulators

POWER CONVERSION SYSTEMS

Advanced Power Electronics and HTS Technology for SMES: Demonstration

Results – Matthew J. Superczynski, Dengming Peng, Nikola Celanovic, & Dusan Borojevic, Virginia Tech; Ronald L. Holtz & Donald U. Gubser, Naval Research Laboratory

Integration of a FACTS and Battery Energy Storage – Z. Yang, C. Shen, L. Zhang, & M. L. Crow, University of Missouri Rolla; S. Atcitty, Sandia National Laboratories

Emitter Turn-Off Thyristor (ETO) based Converters for Energy Storage

– Kevin Motto, Yuxin Li, Aaron Xu, & Alex Q. Huang, Virginia Polytechnic Institute and State University

RENEWABLE AND DISTRIBUTED ENERGY APPLICATIONS

Opportunities for Energy Storage Devices Operating with Renewable Energy Systems

– Andrew Cruden & Graham J. W. Dudgeon, CERPD, University of Strathclyde

Assessing Battery Performance with Distributed Energy Technology Simulators

– Mindi Farber De Anda & Howard Lowitt, Energetics

Photovoltaic Hybrid Test Facility: System Evaluation of Yuasa VRLA/GEL Batteries (including Interface Issues)

– Robert L. Hammond & Spencer Everingham, Arizona State University; Garth Corey, Sandia National Laboratories; Herb Hayden, Arizona Public Service; Jeff Rissmiller, Yuasa; Doug Blodgett, Trace Technologies

Development of Design Practices for PV/Battery Remote Area Power Supplies

– Edward G. Skolnik, Brian Marchionini, & Ndeye K. Fall, Energetics; Paul C. Butler, Sandia National Laboratories; Carl D. Parker, The International Lead Zinc Research Organization

The 400kWh ABESS for the Detroit Edison Company – Peter J. Lex, ZBB Energy Corporation

CLOSING SESSION

Energy Storage Concepts for a Reconstructed Electric Utility Industry

– Joseph J. Iannucci, Distributed Utility Associates

Power Delivery in a Digital World – Imre Gyuk, Dept. of Energy