

Schedule of Events

SUNDAY OCTOBER 26, 2003

5:00 - 7:00 p.m. Registration
Reception — Host: NGK Insulators Ltd.

MONDAY OCTOBER 27, 2003

7:30 - 8:30 a.m. Registration (all day) and Continental Breakfast

8:30 - 8:40 Welcoming Remarks

Imre Gyuk
Phil Symons
Terry Winter
US Dept of Energy
ESA
California ISO

8:40 - 9:10 Keynote Speaker

Overview Chairs: Terry Surles and John Boyes

Location: Empire Room

9:10 - 9:30 Complementary Roles State and Federal Agencies in Energy Development

Terry Surles
California Energy Commission

9:30 - 9:55 Applications and Markets for Electricity Storage in California

Joe Iannucci
Distributed Utility Associates

9:55 - 10:20 A Systems Model for Sizing and Economic Analysis of Energy Storage Opportunities

Al Ingram
BPA

10:20 - 10:45 Life-Cycle Cost Analysis of Energy Storage Technologies for Long- and Short-Duration Applications

Susan Schoenung
Longitude 122 West Inc.

10:45 - 11:00 **BREAK — Location: Walnut Room**

System Comparisons Chair: Mike Hoffman

Location: Empire Room

11:00 - 11:25 Application of Energy Storage Devices at American Electric Power

Al Nourai
American Electric Power

11:25 - 11:50 Assessment of Alternatives to Lead-Acid Substation Batteries

Tom Key
EPRI/PEAC

11:50 - 12:15 A Fundamental Look at Energy Storage Focusing Primarily on Flywheels and Superconducting Energy Storage

Kent Davey
University of Texas

12:15 - 12:35 Energy Storage Handbook for T&D Applications: A Standardized Approach

Steve Eckroad
EPRI

12:35 - 1:30 **LUNCH (provided) — Location: Mezzanine/Franciscan**

Advanced Flywheels Chair: Fred Schwartz

Location: Empire Room

1:30 - 1:55 Successes and Opportunity in High Speed Flywheel Development

Donald Bender
AFS Trinity Power Corporation

1:55 - 2:20 Test, Analysis, and Scale-up of a 1-kWh Flywheel Rotor Design

Art Day
Boeing

2:20 - 2:45 3d CR KEMA Three Dimensional, Counter Rotation, Kinetic, Electro-Mechanical Accumulator

Mario Gottfried
Mexico

2:45 - 3:00 **BREAK — Location: Walnut Room**

Compressed Air Systems Chairs: Les Fairchild and Nisha Desai

Location: Empire Room

3:00 - 3:25 True Cost of Cycling Enhances the Value of Compressed Air Energy Storage Systems (CAES)

Steven Lefton
Aptech Engineering Services, Inc.

3:25 - 3:50 Compressed Air Energy Storage (CAES) Fits Today's Market Requirements

Rolf Althaus
ALSTOM (Switzerland) Ltd.

3:50 - 4:15 Energy Storage Options for Central Illinois

Jason Makansi
Pearl Street Inc.

4:15 - 4:40 New Compressed Air Energy Storage Concept Can Improve the Profitability of Existing Simple Cycle, Combined Cycle Wind Energy, and Landfill Gas Combustion, Turbine-Based Power Plants

Step van der Linden
ALSTOM Power Inc.

4:40 - 5:05 Economic Value of Compressed Air Energy Storage in Conjunction with Large Scale Wind in McCamey

Nisha Desai
Ridge Energy Storage & Grid Services LP

5:00 - 7:00 **RECEPTION — Host: Electricity Storage Association — Location: Franciscan Room**

Schedule of Events

TUESDAY OCTOBER 28, 2003

7:30 - 8:30 a.m. Registration (all day) and Continental Breakfast — *Location: Walnut Room*

CONCURRENT SESSIONS

Power Electronics Chairs: **Imre Gyuk and Brad Roberts**

Location: Empire Room

8:35 - 9:00	Efficient Utilization of Battery Energy Storage Utilizing a Multilevel Converter StatCom	M. L. Crow	University of Missouri
9:00 - 9:25	High Power Energy Storage System Application Using Emitter Turn-off (ETO) Thyristor	Alex Q. Huang	Virginia Polytechnic Institute and State University
9:25 - 9:50	An Optically Interconnected, Heat-Pipe Cooled, HVIGBT-Based, Mega-Watt Inverter, Building Block for DER Applications	Paul Grems Duncan	Airak, Inc.
9:50 - 10:15	High Power Energy Storage System Applications Using an Emitter Turn-Off (ETO) Thyristor in a Transmission Ultracapacitor (TUCAP)	Haresh Kamath	EPRI PEAC

Technology Advances Chair: **Jim McDowall**

Location: Cypress/Monterey Rooms

8:35 - 9:00	Nanomaterials-Based Electrodes for High Discharge and Charge Rate Energy Storage Devices	Amit Singhal	NEI Corporation
9:00 - 9:25	High Power, Bipolar, Nickel-Metal Hydride Battery for Utility Applications	Mike Eskra	Electro Energy, Inc.
9:25 - 9:50	ALABC Progress towards Improved VRLA Battery Performance	Pat Moseley	ILZRO
9:50 - 10:15	Thermal Energy Storage is Electric Energy Storage	Mark MacCracken	Calmac Mfg. Corp.

10:15 - 10:30 **BREAK** — *Location: Walnut Room*

CONCURRENT SESSIONS

Flywheel Systems Chairs: **Gerard Thijssen and James D. Cowart**

Location: Empire Room

10:30 - 10:55	2 MW, 130 kWh Flywheel Energy Storage System	Matthew Caprio	University of Texas
10:55 - 11:20	Kinetic Energy Storage: Solving Problems for Power Engineers around the World	Colin Tarrant	Urenco Power Technologies Ltd.
11:20 - 11:45	Giga-Joule Class of Energy Storage by Large Flywheel, Motor-Generator System	Tatsuya Matsukawa	Nagoya University

Lead Acid Battery Life Predictions Chair: **Phil Symons**

Location: Cypress/Monterey Rooms

10:30 - 10:55	Modeling of Battery Life: I. The Equivalent Circuit Model (ECM) Approach	Bor Yann Liaw	University of Hawaii
10:55 - 11:20	Evolutionary and Adaptive Recurrent Neural Network Modeling for Prediction of Battery Life	Keng C. Yap	ACTA, Inc.
11:20 - 11:45	Real Time Aging Effects on VRLA Batteries in a BESS Application	Robert J. Schmitt	Exide Technologies GNB Network Power Division

11:45 - 12:45 **LUNCH** (provided) — *Location: Mezzanine/Franciscan*

Schedule of Events

TUESDAY OCTOBER 28, 2003, continued

Capacitor and Super Capacitor Development and Applications Chair: Ali Nourai

Location: Empire Room

12:45 - 1:10	Status Report 2003 on Capacitor Storage Systems - ECaSS®	Michio Okamura	Okamura Laboratory, Inc.
1:10 - 1:35	Test and Evaluation of an Asymmetrical Electrochemical Capacitor	Haresh Kamath	EPRI EPAC
1:35 - 2:00	Enhancing the Transient Loadability of Distributed Generation Using an Electro-Chemical, Capacitor-Based Energy Storage System	Satish J. Ranade	New Mexico State University
2:00 - 2:25	Principle of a Hybrid Compressed Air and Supercapacitors Energy Storage System with Maximum Efficiency Point Tracking	Sylvain Lemofouet	Industrial Electronic Laboratory Swiss Federal Institute of Technology
2:25 - 2:50	BREAK — Location: Walnut Room		

CONCURRENT SESSIONS

Lithium Batteries Chair: Stege Eckroad

Location: Empire Room

2:50 - 3:15	Development and Manufacturing of Two, 100 kW/1-Minute, Li-Ion Battery Systems for Energy Storage Applications	Nancy Clark	Sandia National Laboratories
3:15 - 3:40	Performance Characteristics of a Phosphate Lithium-Ion Battery for Utility Backup Applications	Oliver Gross	Valence Technology
3:40 - 4:05	Development of 24 kWh Power Storage System Applying Li-Ion Batteries	Hiroyuki Shibata	Kyushu Electric Power Co

Flywheels for Short Duration Events Chair: Tom Key

Location: Cypress/Monterey Rooms

2:50 - 3:15	Flywheel-Based Recycling of Electrical Energy for Grid Frequency Regulation	Matthew Lazarewicz	Beacon Power Corp
3:15 - 3:40	Dynastore — A Flywheel Energy Storage System for Power Quality Applications in the 10 kWh Class	H. Darrelmann	RWE-Piller GmbH
3:40 - 4:05	Novel Control of Flywheel Generator for Power Fluctuations Compensation	Taku Takaku	Tokyo Institute of Technology

6:00 **Dinner Tommy Toys Restaurant**
Wine provided by KiloFarad International

Schedule of Events

WEDNESDAY OCTOBER 29, 2003

7:35 - 8:35 a.m. Registration (half day) and Continental Breakfast — *Location: Walnut Room*

Storage with Distributed Generation Chair: Herb Hayden

Location: Empire Room

8:10 - 8:35	Hybrid Generation Model Simulator (HYBSIM)	Lumas Kendrick, Jr. Tom Byrd	SENTECH, Inc. Sandia National Laboratories
8:35 - 9:00	Complementary Battery Energy Storage in Inverter-Based Microturbines and Fuel Cell Systems		
9:00 - 9:25	Lessons Learned from the PV Hybrid Battery at Grasmere, Idaho	Tom Hund	Sandia National Laboratories
9:25 - 9:50	Energy Analysis of Batteries in Photovoltaic Systems	Carl Johan Rydh	University of Kalmar
9:50 - 10:15	Coordination of Conventional System, Wind Energy Storage System and Hybrid System for a 40-Megawatt Wind Farm for Operation with the Electrical Power Grid	Paul Lieberman	EnisWindGen®
10:15 - 10:40	Wind Energy Storage with Uncooled Compressed Air	Hans-Peter Beck	Technical University of Clausthal
10:40 - 10:55	BREAK — <i>Location: Walnut Room</i>		

Large Applications 1 Chairs: Ben Norris and Anthony Price

Location: Empire Room

10:55 - 11:20	Recent Progress in Vanadium Redox-Flow Battery	Katsuji Emura	Sumitomo Electric Industries, Ltd
11:20 - 11:45	Commercial Deployment of the NAS Battery in Japan	Toyoo Takayama	NGK Insulators, Ltd.
11:45 - 12:10	Performance and Economic Analysis of the NAS Battery Demonstration at American Electric Power (AEP)	Benjamin L. Norris	Gridwise Engineering Company
12:10 - 1:10	LUNCH (provided) — <i>Location: Mezzanine/Franciscan Room</i>		

Large Applications 2 Chair: Bill Hassenzahl

Location: Empire Room

1:10 - 1:35	The Value of Large Scale Electricity Storage	Mark Kuntz	Regenesys Technologies, Ltd.
1:35 - 2:00	World's Most Powerful BESS is Online and Working in Alaska	Tim DeVries	Golden Valley Electric Association
2:00 - 2:15	BREAK — <i>Location: Walnut Room</i>		

Closing Session Chairs: Imre Gyuk and Phil Symons

Location: Empire Room

2:30 - 2:55	Life-Cycle Air Emissions from Utility-Scale Energy Storage Facilities: Comparative Analysis and Policy Implications	Paul Denholm	University of Wisconsin
2:55 - 3:20	Analysis of New Energy Storage Technologies for Power Quality Solutions in the Distribution Network	Ricardo Lopez	Instituto de Investigaciones Electricas
3:20 - 3:45	The Economic Value of Electricity Reliability and Power Quality	Joseph Eto	Lawrence Berkeley National Laboratory
3:45 - 4:10	Is the Cost There for the Economics? (Comparing Costs and Benefits for Energy Storage Systems)	John Boyes	Sandia National Laboratories
4:10 - 4:35	Closing remarks		