

Ali Nourai Receives Storage Award at ESA's 16th Annual Meeting

Ali Nourai of American Electric Power in Columbus was the recipient of the first annual Phil Symons Electricity Storage Award. Nourai received the award at the Electricity Storage Association's 16th Annual Meeting, held in Knoxville, Tennessee in May.

Mr. Nourai was given the award for his contributions to the technology, use, and understanding of electricity storage. A long-time ESA board member, Mr. Nourai was instrumental in collecting and publishing the data and graphs on the ESA's Web site. Upon receiving the award, Mr. Nourai commented, "I am humbled by this award. Phil Symons was great contributor to the organization and I am very thankful to the ESA."

The Phil Symons Electricity Storage Award was created in remembrance of Phil Symons who passed away in February 2006. Phil's career in electrochemistry and bulk energy storage led him to become one of the founding members of the Electricity Storage Association (formerly Energy Storage Association) and he served as its chairman from 1997 to 2003.

The award will be presented annually to the individual who has made significant contributions to the field of electricity storage.



ESA Chair Jim McDowall, left, presents the first annual Phil Symons Electricity Storage Award to Ali Nourai.

Strength in Flexibility

Storage seen as critical to the future of the grid

The Electricity Storage Association held its meeting in Knoxville, Tennessee May 16-18. The theme of this 16th annual event was “Energy Storage in Action” and attendees were treated to updates on storage systems in the field and a discussion on the future of the industry.

Keynote speaker Larry Dickerman, Director of Distribution Engineering Services of American Electric Power, likened the electricity grid to the parts of his 1967 Austin Healey - it is not the pieces that are so amazing, but



Vince Scaini, Ali Norai, and Haresh Kamath, meeting organizer enjoy the pre-meeting reception.

rather the way in which they are cleverly integrated.

In discussing AEP’s use of storage, Dickerman viewed

storage as a way to “optimize the

machine,” the machine being the electricity grid. For AEP, storage equates to reliability and the extra cost in energy storage provides an insurance premium for a better future grid.

Stabilization of Wind and Renewables Highlighted

Gentaro Koshimizu from Electric Power Development Co., Ltd., Japan, opened the session on Wind and Renewables with results from the field testing of an energy storage system for the stabilization of a large

wind farm in Japan. Due to government incentives and advances in the technology, the installed capacity of wind power in Japan has increased from less than 100 MW in 2000 to 935 MW by April 2006.

Fluctuations in farm output (0-26,000 kW in 10 minutes was one example cited by Koshimizu) make storage a very attractive option for helping to integrate wind farms with the rest of the grid.



The Tomamae Wind Villa Wind Farm on the island of Hokkaido has been coupled with a Vanadium Redox Flow Storage Battery supplied by Sumitomo Electric Industries. The site consists of 19 wind-turbine generators with total electric power of 30,600 kW and the



Larry Dickerman, Director of Distribution Engineering Services at American Electric Power, gave the keynote address to open the meeting.

battery is rated 4,000 kW for 90 minutes (6,000 kWh). Field testing of the system began in January, 2005 and is expected to continue until early 2008. ►

In order to enable the most effective operation of the system and optimize the size requirement of the battery and inverter output while maximizing their functionality and minimizing inverter losses, Koshimizu and his colleagues developed three control methods. State-of-charge feedback control, variable time constant control, and battery bank control all have been verified as of



Mike Lauby, Anthony Price, and Steven Pullins participate in a panel discussion regarding the electricity grids of the future.

March 2006 while the effectiveness of combinations of these controls and a long-run field test are expected to be studied through 2008.

In another example of island wind systems, Jim Sember of S&C Electric Company discussed the Electronic Shock Absorber (ESA) being used on the island of Hawaii. The ESA uses supercapacitors housed in a 30-foot trailer to supplement forty 100-kW turbines that are used to power local water pumps. The ESA provides stored energy to control the rate of power flow to and from the wind farm. By controlling the “ramp rate” of the wind power, the ESA keeps the island’s diesel generator power grid stable and optimizes the use of power from the wind turbines resulting in lower cost of operation for the island grid. The S&C ESA system went into service in May 2006.

Larry Dickerman and Kenta Asano of NGK discussed NGK’s NAS battery installation in Charleston, West Virginia, and Kevin Dennis from ABB gave an update on the NYPA NAS project. Both projects are partly funded by the US Department of Energy. See “NAS Battery Installation Updates” on page 5, provided by kind permission of EPRI, for further details.

Smart Grids and IntelliGrids - whatever the name, storage expects to be there

With electricity demands growing worldwide and the complexity of grids ever changing, nations around the globe are critically examining their electricity systems to plan for the future. Anthony Price of Swanbarton Limited updated the group on the European Union’s Smart Grids initiative. The vision is for Europe’s grids to meet the challenges and opportunities of the future while fulfilling customers’ and society’s expectations and strengthening the business context. Grids will have to deliver high standards of security and quality, reduce operating costs, minimize constraints on power flows, renew aging assets without supply disruption, and increase remote control and automation at both the generation level and at the customer level. Working groups have been created, including WG4, which examines Generation and Storage, that will consider actions in the R&D areas that will support the Smart Grids vision.

Similarly, Steven Pullins of SAIC discussed the Modern Grid Initiative in the U.S. where federal, state, and private entities are working toward aligning all grid players. The initiative sees the modern grid as being self-



From left, Charles Mazzacato of Axion Power, Tom Geist of EPRI Solutions, Melinda Norris of Southern Company, and Ashish Moondra of Active Power enjoy the dinner cruise on the Star of Knoxville.

healing, empowering the consumer, tolerant to security breaches, providing quality, accommodating a variety of generation options, fully enabling electricity markets and optimizing asset use and minimizing O&M costs. ►

ESA Board Elected at Meeting

The Board of Directors of the Electricity Storage Association held an election to fill vacant posts at its annual meeting in Knoxville. Newly elected to the board was Taku (“Tak”) Oshima of NGK Insulators in Japan.

Reelected to the board were Jim McDowall, Saft (Chair); Brad Roberts, S&C Electric (Vice Chair/Chair-Elect); Ben Norris, Distributed Utility Associates (Treasurer); Matt Lazarewicz, Beacon Power; and Gerard Thijssen, KEMA. Rounding out the board are Rick Winter, Distributed Utility Associates (Secretary); Bill Hassezahl, Advanced Energy Associates; Ali Nourai, AEP; and Haresh Kamath, EPRI Solutions, all of whom are at midterm. The board accepted the resignations of Mark Kuntz and Carl Keyes and thanked them for their many contributions.

Mike Lauby of EPRI discussed the IntelliGrid Consortium created by EPRI to pave the way to power system of the future. The consortium, made up of leaders in the public and private sectors, hopes to integrate and



ESA Board members Gerard Thijssen and Matt Lazarewicz at the pre-meeting mixer.

optimize global research efforts, fund high-impact R&D on enabling technologies, and lead an international effort to disseminate technical conclusions to promote adoption by others.

Price, Pullins, and Lauby then participated in a panel discussion and fielded questions from the audience. All participants felt that storage was an essential part of the future of the grid and encouraged the ESA and its members to continue to promote storage actively.

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Imre Gyuk wasn't able to attend the ESA meeting but the US Department of Energy vision for storage was presented by John Boyes of Sandia National Laboratories. With DOE's discretionary budget being attacked by earmarks, more 'bang for the buck' is being achieved through cooperative efforts with State government organizations such as the California Energy Commission (CEC) and the New York State Energy Research and Development Agency (NYSERDA), and with other national governments such as the initiative with the Australian National Greenhouse Office. In a first for an ESA meeting, CEC and NYSERDA participated in the proceedings through a teleconference link. The session was rounded out by a visionary presentation by Steve Eckroad, who highlighted opportunities for storage in the EPRI Electricity Technology Roadmap.

EPRI Solutions hosts site tour

Rounding out the conference was a tour of EPRI Solutions, the host for this year's meeting. Included on the tour were some of the projects showcased in the meeting, including Active Power's CoolAir UPS system, Beacon Power's frequency regulation application, ElectroEnergy's distributed peak shaving system, and the TVA TUCAP device. Attendees also had a chance to see EPRI Solutions' involvement in other ►

NAS Battery Installation Updates

*Reproduced with permission from EPRI Program 94
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American Electric Power (AEP) has nearly completed the installation of its NAS battery, built by NGK Insulators Ltd., at an Appalachian Power Co. substation in Charleston, West Virginia. The Charleston substation was chosen to receive AEP's initial megawatt-scale NAS by satisfying several criteria, including economics, service reliability, and anticipated load growth.

After the NAS unit has operated at Charleston for several years, AEP will analyze its equipment upgrade options and consider moving it to another site, as needed. NGK expects the battery to last for 15 years, or for 4,000 to 5,000 charge/discharge cycles at 90% of full energy capacity.

In addition to NGK, AEP's project partners include S&C Electric Co., which is supplying the power electronics and serve as system integrator. Sandia National Laboratories is a supporting sponsor and is helping fund the project.

New York Power Authority's (NYPA's) NAS passed factory acceptance testing in Nagoya, Japan in late April and is on schedule to be delivered to the Metropolitan Transportation Authority's (MTA) Long Island Bus subsidiary in July. Once installed, the energy storage device will reduce energy

and maintenance costs associated with the natural gas compressor station used to fuel approximately 220 compressed natural gas buses. It will power the compressor during the day and automatically recharge from the grid at night, when utility electric rates are lower. MTA and NYPA officials were attracted to the NAS's silent, emission-free operation as well as its ability to improve power quality and provide voltage support to the distribution system.

ABB North America is providing the power conditioning unit and turnkey installation for the project, while EnerNex Corp. will handle data acquisition and monitoring. NYPA secured approximately \$1.9 million in funding from the New York State Energy Research and Development Authority (NYSERDA), Long Island Power Authority (LIPA), American Public Power Association (APPA), the Canadian Energy Association, several other electric utilities, and EPRI. NYPA will finance a matching \$1.9 million in project costs through its energy services program. ▲

Latest news from AEP:

The installation has been up and running since June 18 and made its first scheduled load-shifting discharge on June 26. AEP plans an official inauguration of the system on July 20.

projects, such as monitoring and analysis of the CEC energy storage projects in California, as well as activities such as power quality compliance evaluation and UPS testing. ▲

Future Events

Department of Energy Peer Review Meeting

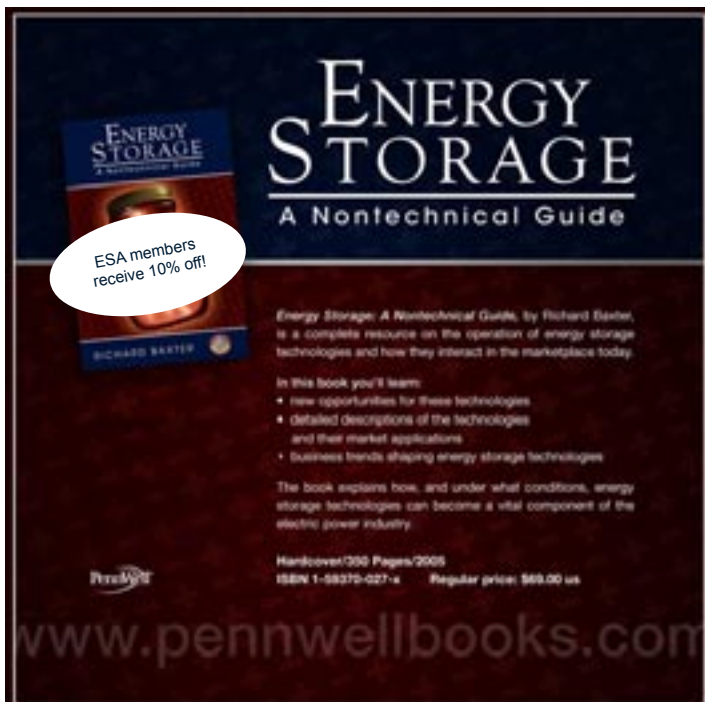
November 2-3, 2006, Washington, D.C. Reports on progress in storage system integration, advanced batteries, fly-wheels, supercapacitors, and power electronics.

Battcon 2007

April 30 - May 2, 2007, Tampa, Florida. Three day, non-commercial, technical symposium for storage battery users from various industries. <http://www.battcon.com>

ESA Annual Meeting 2007

Mid-May, 2007, Boston, Massachusetts. Exact dates and location will be announced soon.



About the ESA

Our Mission

To promote the development and commercialization of competitive and reliable energy storage delivery systems for use by electricity suppliers and their customers, thereby bringing financial and technical benefits for energy storage operators.

Membership Benefits

- ▶ Gain early knowledge of the latest developments in energy storage technology and field/customer applications of new/innovative storage technologies, and information on how these can be used for member's business advantage
- ▶ Early notification of upcoming business leads in US and abroad
- ▶ Enhanced exposure to potential customers for energy storage products and services
- ▶ Ability to network with users, manufacturers, and researchers in the energy storage field
- ▶ Access to ESA contact list of more than 800 names of industry leaders interested in energy storage
- ▶ Ability to actively interface with key representative from government and industry to receive insights into energy storage markets and strategic directions of key industrial firms

Join Now

General Membership is \$750 per year which includes attendance at meetings, conference proceedings, special tours, and social events.

Join the ESA between now and December 31 and receive full ESA 2007 member benefits at no additional cost.

To join the ESA, complete our on-line membership form. You will be asked to provide credit card information over our secure transaction server.

For questions about membership in the ESA, contact Gerard Thijssen in the Netherlands at +31 26 3 56 26 03 or email membership@electricitystorage.org.