

ADVANCES IN DISTRIBUTED RESOURCES – 2004 PANEL SESSION SUMMARY

J. J. Bzura *, *Senior Member, IEEE*
Chairman, Distributed Generation (DG) and Energy Storage (ES) Working Group
within the IEEE Energy Development Subcommittee

This session will begin with a brief description of the DG & ES Working Group, including the range of technical interests, types of panel session presentations made, WG membership and potential topics for future panel sessions. The individual presentations which will follow are summarized below.

“Development of Sources and a Testbed for CERTS Microgrid Testing”, prepared by John Stevens of Sandia National Laboratories, will first describe the Consortium for Electric Reliability Technology Solutions (CERTS) plan for testing numerous DG technologies and control strategies within a microgrid at a site to be owned and operated by an electric utility. The current configuration calls for three main 480-volt circuits within the microgrid, which can operate independent of the grid (islanding mode) if desired.

“High-Power Batteries for Utilities – The World’s Most Powerful Battery and other Developments”, prepared by Jim McDowall of SAFT America, Inc. , will primarily discuss the Battery Energy Storage System (BESS) project utilizing nickel-cadmium (Ni-Cd) batteries under way at an Alaskan utility. Subsequent topics will include ongoing developments in Ni-Cd batteries designed for aviation use and lithium-ion (Li-ion) batteries.

An ancient concept in ultra-modern form, flywheel energy storage, will be described in a presentation by Matthew Lazarewicz and Alex Rojas entitled ***“Flywheel-based Recycling of Electrical Energy for Grid Frequency Regulation”***. The design of modern high-speed, low-mass flywheel systems will be covered briefly, followed by a discussion of how frequency regulation is generally done today in power pools. Several examples will show how modular flywheel energy storage (FES) systems are uniquely suited to grid frequency regulation, and can provide other operating benefits. Energy efficiency and economic analysis are also discussed.

Three authors have combined efforts to develop a presentation ***“Optimization of a Feeder Using DR”***. They are Stephen Early of AEP, John Kelly of the Gas Technology Institute (GTI), and David Nichols of AEP. The presentation is based in part on a recent study done for the U. S. Department of Energy by GTI and in part on work done at AEP in this area.

“Advances in Solid-oxide Fuel Cell Technology” is the concluding presentation, by John Bzura. Despite the significant technical barriers of operating a fuel cell at temperatures on the order of 1,000 C, considerable activity is taking place at many companies worldwide. Systems are being designed for residential combined heat and power (CHP) use, with 1-5 kW of electrical output, as well as 125-kW systems targeted for industrial or commercial use. The major companies and products in development will be discussed, along with government support programs in North America.

* John J. Bzura, Ph.D., P.E., is a Principal Engineer with National Grid USA Service Company, 25 Research Drive, Westborough, MA 01582.