

Performance and life verification testing of modules and batteries under uniform test conditions with standard and special test procedures will be continued during 1983. Modules and/or batteries to be tested include improved lead-acid, nickel/iron, and nickel/zinc electric vehicle batteries; lead-acid hybrid vehicle batteries; and (if far enough advanced) zinc/chloride, zinc/bromine, or sodium/sulfur technologies.

Facility maintenance and improvement will be provided to accommodate the needs of the testing program. The number of test stations that can provide simulated driving profiles and other types of programmable loads will be expanded from 6 to 10 to meet the needs of the program. An additional 100-kW test station will be installed to accommodate advanced batteries such as Zn/Br, Zn/Cl, or Na/S.

Recent publications

- 1 D. Corp, E. Berrill, D. Fredrickson *et al.*, Peak-power characteristics of improved electric-vehicle batteries, *1982 SAE Congress, Detroit, MI, February 22 - 26, 1982.*
- 2 W. H. DeLuca, R. L. Biber and N. P. Yao, Effects of constant-current/constant-voltage charge parameters on lead-acid traction cell performance, *Proc. 16th Intsoc. Energy Conversion and Eng. Conf., Am. Soc. Mech. Eng., 1981.*
- 3 F. Hornstra, E. Berrill, P. Cannon *et al.*, Battery testing results at the National Battery Test Laboratory, *4th DOE Battery and Electrochemical Contractors' Conf., Washington, DC, June 2 - 4, 1981.*
- 4 F. Hornstra, C. Christianson, P. Cannon *et al.*, The impact of regenerative braking on battery performance and energy cost in electric vehicles in urban driving patterns, *EVC Symposium VI (EV EXPO 81) sponsored by the Electric Vehicle Council, Baltimore, MD, October 21 - 23, 1981.*
- 5 F. Hornstra and N. P. Yao, Standard test procedures for electric-vehicle batteries at the National Battery Test Laboratory, *1982 SAE Congress, Detroit, MI, February 22 - 26, 1982.*
- 6 C. A. Swoboda, P. H. Cannon, F. Hornstra *et al.*, Solid state high common-mode battery cell voltage scanner, Argonne National Laboratory, *Report ANL/OEPM-81-7, November 1981.*

BATTERY ENERGY STORAGE TEST (BEST) FACILITY

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The objective of work under the Tripartite Contract between the Department of Energy (DOE), the Electric Power Research Institute (EPRI), and Public Service Electric and Gas Company (PSE & G) is the design (Phase I), construction (Phase II), acceptance testing (Phase III), and operating (Phase IV) of a national test facility to evaluate and assess advanced load-

leveling batteries and power conversion equipment in a utility environment. During the operations phase of the project, a variety of advanced utility load-leveling battery energy storage systems in the range of 500 kW h to 10 MW h will be tested and evaluated.

All engineering and construction work for the baseline facility has been completed and operation of the facility commenced on July 1, 1982. The BEST Facility Startup and Acceptance Test Program consisting of factory tests, construction verification tests, operational tests, and acceptance tests was completed in December 1981. The Acceptance Test Report was submitted in May 1982 and accepted by DOE and EPRI in June 1982. On December 30, 1981, PSE & G was awarded a contract modification for operation of the facility. Work continues on the preparation and coordination for a 500-kW h zinc/chloride battery to be installed in Test Bay No. 2.

The first year of operation of the BEST Facility will be concluded in mid-1983. At that time, preparations for testing the zinc/chloride battery are expected to be completed, and battery installation will begin. A test program for this battery is scheduled to start in late 1983. Also under consideration is the rearrangement of Test Bay No. 1 for installation of an optimized lead-acid battery. This battery is scheduled for installation in late 1983 and testing in 1984.

Recent publications

- 1 J. C. Del Monaco, P. A. Lewis, H. T. Roman and J. Zemkowki, Advanced batteries for load-leveling — the utility perspective on system integration, *IEEE Power Engineering Society 1982 Winter Meeting, NY, January 31 - February 5, 1982.*
- 2 E. A. Hyman and M. Baum, Modeling and characterization of lead-acid battery discharges, *162nd Meeting of the Electrochemical Society, Detroit, October 1982.*
- 3 P. A. Lewis, Energy storage, batteries and the BEST facility, *American Nuclear Society Winter Meeting 1981, San Francisco, November 29 - December 3, 1981.*
- 4 A. Pivec, E. A. Hyman and B. M. Radimer, The BEST facility at completion: capabilities and extended mission, *30th Power Sources Symposium, Atlantic City, June 7 - 10, 1982.*
- 5 A. Pivec, B. M. Radimer, E. A. Hyman *et al.*, Initial operating characteristics of the Battery Energy Storage Test (BEST) facility, *17th Intersociety Energy Conversion Engineering Conference, paper #642, Los Angeles, August 1982.*
- 6 Public Service Electric and Gas Company, *BEST Facility Contract No. De-AC02-76ET29368 Acceptance Test Report.*
- 7 Public Service Electric and Gas Company, *Guidelines for BEST Facility Test Programs*, issued to BEST Facility Program participants.