This Week at NETL

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CO_2 Enhanced Oil Recovery Planning System Successfully Applied in Field

Engineers and technicians from NITEC LLC (Denver, Colo.) and Linc Energy Ltd. (Brisbane, QLD, Australia) have completed a case study of a user-friendly software system called COZSim designed to help small- to mid-sized field operators plan and optimize their CO_2 enhanced oil recovery (CO_2-EOR) and sequestration operations within a short time frame. Developed in cooperation with NETL, the NITEC software system considers all the significant physical and chemical factors that impact the flow and recovery of reservoir fluids, yet it works fast enough to complete an integrated feasibility study within a month, reducing cost to the user. Using real-world data from the Linc Energy South Cole Creek Field in Converse County, Wyo., the case study was a success for both participating parties: Linc Energy obtained information that can now be used to develop a CO_2-EOR operational plan, and NITEC gained feedback and insight that improved the functionality and accuracy of their software package.

Water Assessment Model to Aid in Arkansas Permitting Process

A soil and water assessment tool (SWAT) developed in cooperation with NETL by researchers at the University of Arkansas Center for Advanced Spatial Technology is being used to model surface water availability in four large watersheds and 75 sub-basins of the Fayetteville Shale region in northern Arkansas. SWAT is part of an effort to develop a water-management decision-support system to help reduce potentially adverse impacts from hydraulic fracturing in the region and to predict how ground and surface water withdrawals affect water availability and quality in a watershed. Modeled results will help the Arkansas Natural Resources Commission predict physical availability of surface water and allocation levels during times of shortage. Modeled flow rates can be used by the commission during the water-withdrawal permitting process to make decisions that are better informed about withdrawal volumes, duration, and timing.

Confidence Grows for Energy Storage System in Fast-Responding Regulation Service

The 36-megawatt lead-acid-battery energy-storage system installed at Duke Energy's 153-megawatt Notrees wind farm near Odessa, Texas, has successfully provided fast-responding regulation service to the grid since February. Operating in a newly initiated pilot program sponsored by the Electric Reliability Council of Texas (ERCOT), the storage facility is on call to dispatch power to the grid in 1-minute intervals, with a maximum of three contiguous intervals. Short periods of operation time may seem trivial, but these brief bursts of power are extremely important to maintaining the integrity of the grid. By successfully substituting a renewable energy source for a fuel-burning spinning reserve to instantly provide power to stabilize grid frequency, the approach is carving out a technically feasible and economically optimal niche for wind/storage-based facilities. Originally, ERCOT considered using only 25–30 percent (10 megawatts) of stored power before requiring a recharge, but the grid has pulled 90 percent at times, demonstrating mounting confidence in the Notrees storage facility. NETL is managing this Smart Grid Demonstration Project, partially funded through the American Recovery and Reinvestment Act of 2009, on behalf of the Office of Electricity Delivery and Energy Reliability to accelerate modernization of the nation's electricity delivery system.

Energy Storage Added to Green Impact Zone Smart Grid Demonstration

A 1-megawatt lithium-ion-battery energy-storage system has been deployed at the Kansas City Power & Light (KCP&L) SmartGrid Innovation Park, a facility established to educate consumers about new, cutting-edge technologies that will help make the nation's electricity production and delivery system smarter, more resilient, and more efficient. One of 16 similar efforts funded by the American Recovery and Reinvestment Act of 2009, this project is designed to study how the new technologies interact and their collective effect on electric grid delivery and reliability. The facility is part of the KCP&L Distributed Energy Storage System, one of numerous smart grid technologies that are intended to provide improved service to an underserved population of approximately 14,000 residents and businesses within a 150-block area in midtown Kansas City designated as the "Green Impact Zone." The battery system is an aspect of the utility's strategy to provide advanced energy infrastructure—a strategy that emphasizes systems integration, interoperability, and cyber and physical security. NETL manages this and other Smart Grid Demonstration Projects on behalf of the Office of Electricity Delivery and Energy Reliability.

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