March 2004

Research Highlights

Science & Technology

Science for Today
Solutions for Tomorrow

Director's Office (Denver, Colorado)

Shannon Cunniff, Director of Research and Development, accepted a position with the Department of Defense and left the Bureau of Reclamation (Reclamation) at the end of March. Chuck Hennig will be the Acting Director for a period of time, and Dan Levish will be the Acting Research Coordinator. (Siegie Potthoff, 303-445-2136)

The Science and Technology (S&T) Program Fiscal Year 2005 Call for Proposals was made by email distribution to all Reclamation employees. You can also find it on our website, along with a preliminary sample proposal form. (Siegie Potthoff, 303-445-2136)

Modifications and improvements to the Proposal and Contract Management System (PropC) continued this month and are estimated to be completed at the end of April. An announcement will be made when PropC is open for proposal submission and progress report updates. (Siegie Potthoff, 303-445-2136)

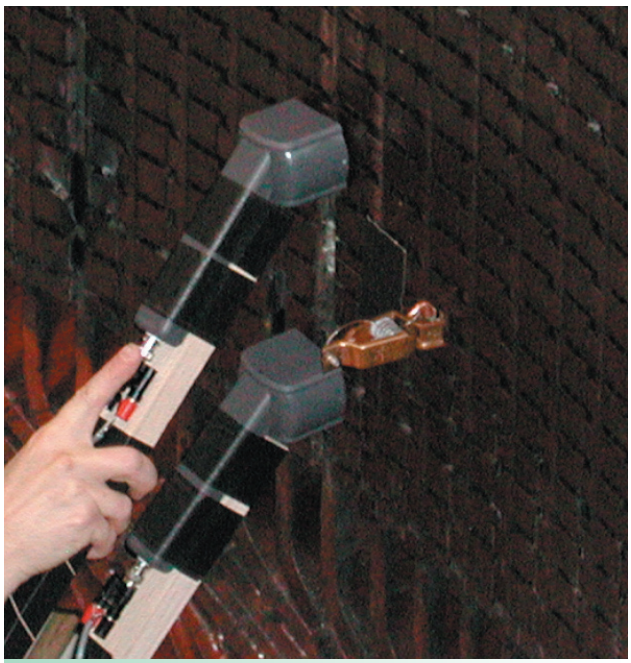
Upcoming Events

April	
Week of April 19	Email announcing call for R&D proposals for S&T program for FY05. The Submitters portion of PropC will be opened for submission of proposals for FY05 and for submittal of progress reports for FY04. (Siegie Potthoff, 303-445-2136)
June	
7-10	**Lower Klamath Basin** Science Workshop, **Arcata, CA**. (Chuck Hennig, 303-445-2134)
Week of June 21	Proposal submission process will close and review phase will begin. (Siegie Potthoff, 303-445-2136)
August	
3-4	Steering Team Meeting (tentative), **Fort Collins, CO**. (Siegie Potthoff, 303-445-236)
October	
Early October	Funding awards made for FY05.

Improving Infrastructure Reliability

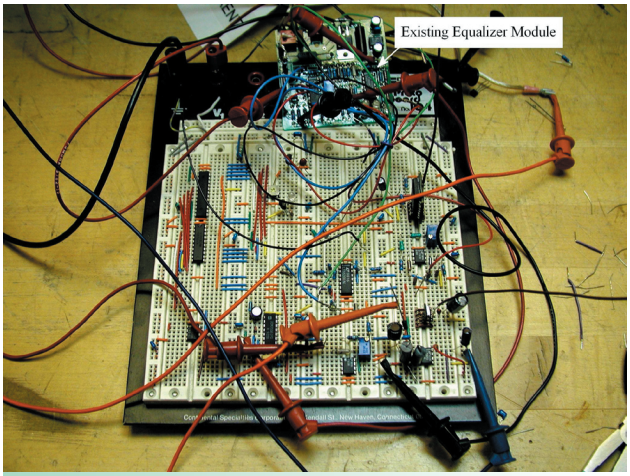
As part of continuing power system diagnostic efforts, the TSC plans to conduct a literature review and develop a field testing program for obtaining online machine (generator) electrical parameters. The first opportunity to perform online field testing will arise at **Crystal Powerplant** this summer. Improved parameter testing methods will result in more reliable plant operation with less downtime, and enhanced machine modeling capability to improve power system stability and reliability. (Phil Atwater, 303-445-2304)

Engineers at the **Technical Service Center (TSC)** presented a technical paper, titled *Stator Ground Fault Locating Method*, at the 2004 International Conference of Doble Clients, Rotating Machinery Committee, in **Boston, Massachusetts**. This paper is the product of the TSC's research and development work on tracking impulse currents in stator windings with electronic signal processing equipment to identify the point of origin of winding insulation faults in large hydroelectric generators and motors (see photo below). (Phil Atwater, 303-445-2304)



Specialized, hand-held, magnetic flux probes, placed against the stator core of a 28-MW hydroelectric generator, quickly locate stator winding faults.

TSC engineers have submitted a Report of Invention for *Battery Cell Float Voltage Equalizer Enhancements*. This report covers enhancements to the invention of a method and device for equalizing the float voltage of a battery cell, for which the TSC filed a patent application on August 21, 2003. This patent-pending equalization process keeps the cells at peak performance, extends the useful life of the battery, and also indicates when a cell voltage is out of tolerance, signaling that the cell is beginning to fail. These enhancements will increase the usable life and reliability of powerplant batteries. Powerplant batteries are the most critical system in a powerplant and are the sole source of power and control in emergency situations. (Jim DeHaan, 303-445-2305)



Lab testing new circuits for the battery cell equalizer module

Improving Decision Support

The economics group of the TSC recently presented preliminary results at the annual meeting of a U.S. Department of Agriculture (USDA) sponsored interagency research group, relating to the valuation of wildlife benefits, including endangered species. This research valued critical habitat for nine threatened and endangered fish species in the Southwest U.S. Among the results, the research showed that preserving habitat provides significant economic value to households in the U.S., but that the level of value may depend on the methodology of the data collection. These results can help in

the operations of Reclamation sites that affect listed fish species. (Earl Ekstrand, 303-445-2731)

TSC personnel delivered a paper at the national meeting of the Association of American Geographers in **Philadelphia**, titled *Water Supply Conflicts in the West*. The paper discussed various potential approaches for identifying conflict and supply shortages and outlined plans for a western water information network, which is a geographic system being constructed with S&T funds to offer decision support to water managers. Reclamation and the University of Denver coauthored the paper. (Doug Clark, 303-445-2271)

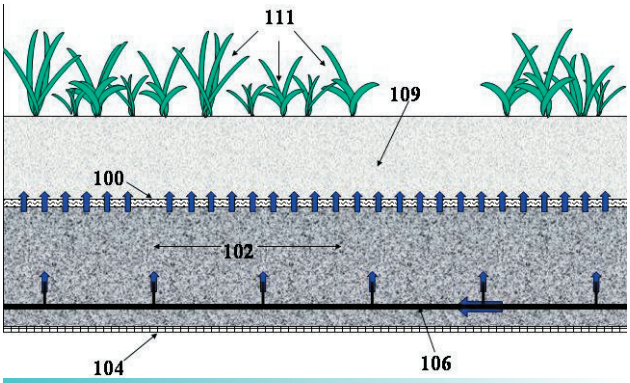
The Interagency Watershed and River Systems Management Program (WaRSMP) Technical Team met at the **Boulder Canyon Operations Office**. The meeting allowed representatives from Reclamation, the U.S. Geological Survey, the Center for Advanced Decision Support for Water and Environmental Systems, the Desert Research Institute, and the Natural Resources Conservation Service to discuss the results of their ongoing research efforts and identify priorities and approaches for future research efforts. (Don Frevert 303-445-2473)

Upcoming Events

April 15 — Members of the WaRSMP Columbia Basin Research Team will hold a conference call to review progress and identify funding sources to support technology improvements needed to complete the task. (Don Frevert 303-445-2473)

Improving Water Supply Technologies

The U.S. Patent and Trademark Office awarded a patent to William Kepler, Kurt von Fay, and Alice Comer for their invention of a Geosynthetic Material Irrigation System. This invention is an economical and easily installed irrigation system for agricultural products covering large areas. This system can be placed directly on the area to be irrigated without digging a trench or hole. Agricultural products, such as turf or row crops, are placed with top soil directly on the system. (William Kepler, 303-445-2386; Kurt von Fay, 303-445-2399)



Geosynthetic Material Irrigation System is composed of a water-permeable geosynthetic (100), a layer of sand (102), an impermeable geosynthetic bottom layer (104), and a water distribution system (106). The vegetation (111) is grown in topsoil (109) placed on the system.

Improving Water Delivery Reliability

Reclamation personnel presented a paper at the Western Division of the American Fisheries Society in **Salt Lake City, Utah**. This paper was on the effects of low dissolved oxygen releases from **Canyon Ferry Dam, Montana**, on fish distributions in **Hauser Reservoir** immediately downstream. Canyon Ferry Dam has had a history of issues associated with low oxygen in the tailrace, and this paper was a summary of findings to date. (Mike Horn, 303-445-2203)