



RESEARCH HIGHLIGHTS



DIRECTOR'S OFFICE (WASHINGTON, DC AND DENVER, COLORADO)

UPCOMING EVENTS

- Mid-October Desalination hearing on the Hill (Shannon Cunniff, 202-513-0682)
- October 28-30 U.S. Geological Survey Regional Executives and Program Coordinators meeting, **Washington, DC** (Shannon Cunniff, 202-513-0682)
- November 4 Water 2025 science meeting, Adams Mark Hotel, **Denver, Colorado** (Shannon Cunniff, 202-513-0682)
- November 13-14 Satellite Imagery for Water Management: A NASA/Reclamation Planning Session and Workshop, **Albuquerque, New Mexico** (Doug Clark, 303-445-2271)

IMPROVING INFRASTRUCTURE RELIABILITY

Worked on identification of generator control systems focused on the determination of complex, nonlinear systems. Simultaneous identification of both large- and small-signal response characteristics is a particular challenge, due to the solution techniques and the lack of complete information available in typical measurement data. Both types of characteristics are essential for developing full models of excitation systems and identifying controller malfunctions. (Shawn Patterson, 303-445-2311)

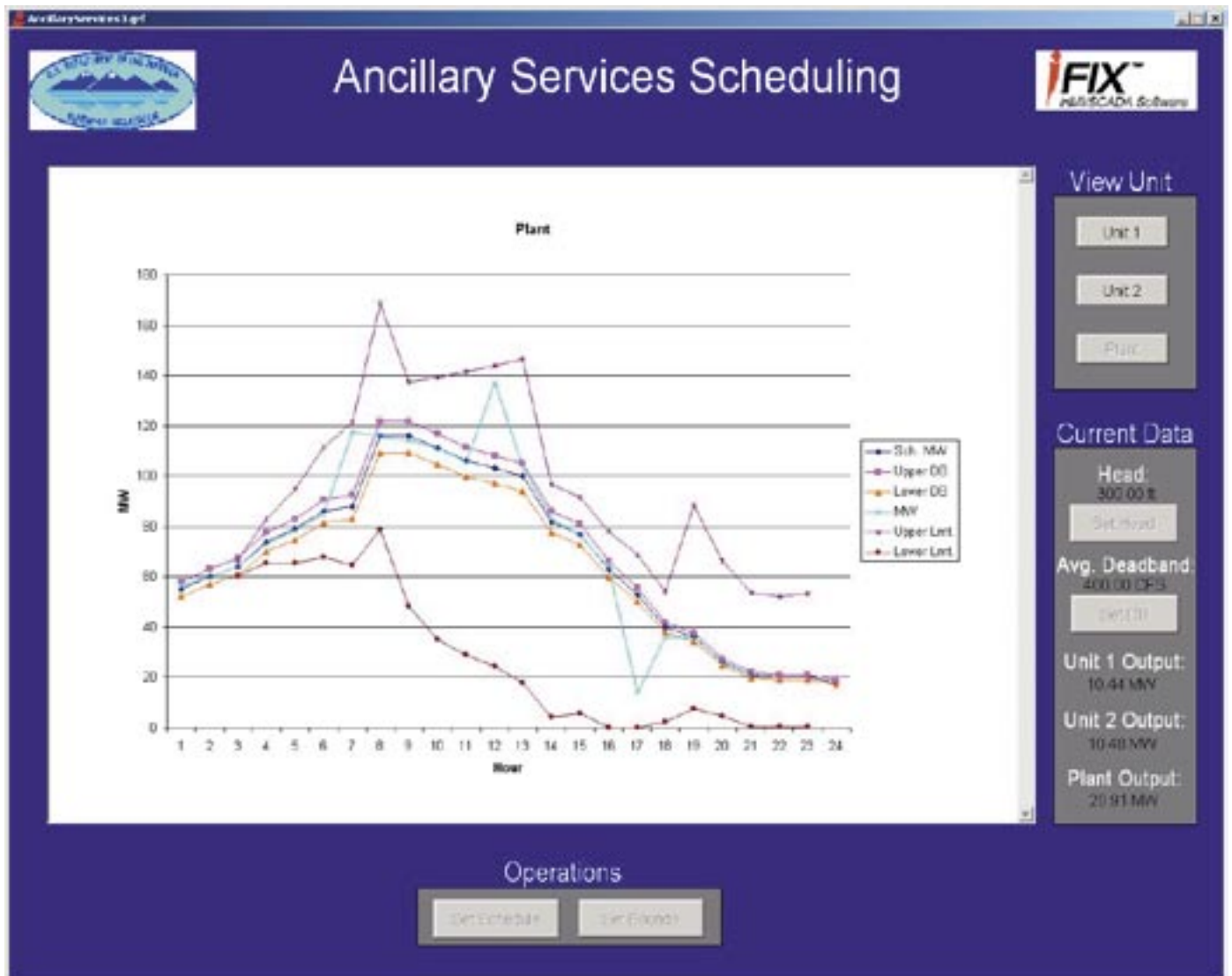
The draft instruction manual for the microwave tunnel transceiver radio set equipment was completed. Next month, the manual will be distributed to Reclamation owners of the radio sets. These radio communication sets provide a means for work crews, who are often 5 miles or more from the nearest tunnel exit, to communicate with persons on the outside. Providing this communication link greatly increases the safety of performing work in a tunnel. (Phil Atwater, 303-445-2304)

As part of the research to evaluate the Power System Diagnostics database collection and testing program, sweep frequency response analysis testing was performed on power transformers at **Flaming Gorge, Estes, and Marys Lake Powerplants**. This type of testing has not been standard practice, and Science and Technology (S&T) seed money is assisting in assessing testing methods, establishing a database, and formulating a Reclamation testing program. (Phil Atwater, 303-445-2304)

Investigating the feasibility of the Doubly Fed Machine for the **Mt. Elbert Pump-Generating Plant**, as well as possible efficiency gains and construction costs. This research is being conducted in conjunction with the Mt. Elbert Powerplant rehabilitation project. The Doubly Fed Machine, if proven viable, would be an option for increasing efficiency at Mt. Elbert and other locations. (Gary Cawthorne, 303-445-2817)

As part of study effort to create methods for predicting powerplant energy-related ancillary service production, a prototype scheme was completed that sets day-ahead limits and hour-ahead limits for regulation from a powerplant with a daily water release schedule. The figure below shows a 24-hour simulation, where 19 hours of the simulated day have been completed. The simulation has a preset schedule, day-ahead hourly upper and lower bands for regulation based on a flow deadband (Upper DB/Lower DB), actual operation (MW), and hourly limits that may be accessed for regulation predicted 2 hours in advance (Upper

Lmt/Lower Lmt). The scheme is designed to limit regulation, so that a daily release within 400 ft³/s of the average for the day can be achieved. In this particular simulation, three hourly excursions to provide regulation beyond the preset flow deadband have been made in hour 7 (up excursion), hour 12 (up excursion), and hour 17 (down excursion). During October, a description of the simulation will be completed and sent to **Lower Colorado** staff for review. A demonstration of the system will be set up as desired by Reclamation and Western Area Power Administration staff. (Steve Stitt, 303-445-2316)



IMPROVING DECISION SUPPORT

In conjunction with research and development work being conducted by the Federal Interagency Sedimentation Project, the U.S. Geologic Survey hosted an interagency workshop, “Sediment Monitoring Instrument and Analysis Research Program,” in **Flagstaff, Arizona**. Presentations were made on many new technologies in the areas of measurement and analysis of suspended sediment, bed load, bed material, and bed topography. Discussions were held in breakout sessions for each topic to brief participants on ongoing and future research efforts, to evaluate various technologies, and to determine future data measurement and analysis needs. Data flux, uncertainty, storage, and dissemination were also discussed. Papers submitted to the workshop are now posted, and the workshop proceedings will be posted by year’s end at: <http://water.usgs.gov/osw/techniques/sediment/sedsurrogate2003workshop.html>. (Christi Young, 303-445-2561)

UPCOMING EVENTS

- October 15-16 WaRSMP’s Independent Technical Review Panel will meet in **Boulder and Denver, Colorado**, to evaluate progress on the program and provide recommendations for how to improve technology. The panel includes experts from Colorado State University, Utah State University, Louisiana State University, and the U.S. Army Corps of Engineers. (Don Frevert, 303-445-2473)
- October 21-22 WaRSMP team members from Reclamation, USGS, and other collaborating organizations will hold their fall meetings in **Sagehen, California**, to evaluate progress on the program and set technical priorities for the coming months. (Don Frevert, 303-445-2473)
- October 23-24 The Reclamation Hydrologic Data Base and RiverWare technical teams will meet at the University of Nevada’s Desert Research Institute in **Reno**. (Don Frevert, 303-445-2473)

IMPROVING WATER SUPPLY TECHNOLOGIES

A short course on advanced water treatment was held in **Phoenix, Arizona**. All of the regions were represented. The course presented an overview of treatment processes from screening to desalination, stabilization, and disinfection. After the classroom work, attendees toured the Scottsdale Water Campus, a state-of-the-art water factory, producing conventionally treated well water for potable use, microfiltered secondary sewage for irrigation, and MF/RO- (microfilter/reverse osmosis) treated secondary sewage that is further treated as it percolates through to the aquifer. This new source of water takes over 3 years to reach potable water wells. Understanding treatment options and costs is imperative to working with impaired water. The Water Treatment Engineering and Research Group is available to present the course. (Michelle Chapman, 303-445-2264)



Participants at the advanced water treatment course.

The barium chloride study in **Mesquite, Nevada**, carried out in conjunction with a desalting pilot study, has concluded with negative results. The hypothesis that barium sulfate could be recovered from **Virgin River** water proved to be accurate, but expensive and “tricky.” The next step will be to precipitate calcium sulfate from the concentrate stream and possibly return the effluent to the feed stream. The sulfate concentration in Virgin River water limits recovery to 50 percent. (Michelle Chapman, 303-445-2264)

Testing should begin in October on modifications to **Canyon Ferry** turbines. Work is being finished to allow air injections to increase dissolved oxygen. Monitoring downstream of the dam will look for any signs of supersaturation problems. This research allows dam operations to meet water quality standards without significant costs or changes to operations and could serve as a template for problems like this that could arise at other facilities. (Mike Horn, 303-445-2203)

Published Research Report R-03-02, *A Survey of Selective Withdrawal Systems*. This project was conducted in cooperation with the **Upper Colorado Regional Office** and the Science and Technology Program. The survey was developed to determine the state-of-the-art of selective withdrawal systems in operation throughout the United States. The survey report contains design and performance data, along with operation and maintenance information. (Tracy Vermeyen, 303-445-2154)

REGIONAL REPORT

The **Albuquerque Area Office** has installed 11 piezometers for a project to incorporate realtime evapotranspiration (ET) monitoring into the Upper **Rio Grande** Water Operations Model (URGWOM). Instrumentation is recording hourly water levels, and stage is being recorded in the river and in each of the riverside drains at the **Rio Bravo** section. Data have been collected since mid-August. All piezometer locations have been selected at seven bridge sections. The project will help to better characterize the interaction between surface water and ground water along the Rio Grande, so that a proper modeling of the partition between loss to ground water and loss

to evaporation and transpiration can be made. The project will result in more accurate water operations through improvements to URGWOM and the ET Toolbox. (Steve Bowser, 505-462-3592)

“Insects on *Pholisma sonora* (Lennoaceae) flowers and their conspecific pollen loads” has been published in *Madrono*, vol. 50, No. 2, pp. 110-114, published by the California Botanical Society. *Pholisma sonora* is a rare parasitic plant found in sand dunes along the **All American Canal** in southeastern California. Reprints are available from Bill Wiesenborn, wwiesenborn@lc.usbr.gov. (Bill Wiesenborn, 702-293-8699)