

RECLAMATION

Managing Water in the West

TR-2012-12

Travel to Davis Dam

To scope additional turbulence field testing options

Dates of Travel: October 10-11, 2012



**U.S. Department of the Interior
Bureau of Reclamation
Technical Service Center
Hydraulic Investigations and Laboratory Services Group
Denver, Colorado**

BUREAU OF RECLAMATION
Technical Service Center
Denver, Colorado

TRAVEL REPORT

Code: 86-68460 Date: October 19, 2012

To: Manager, Hydraulic Investigations and Laboratory Services Group
From: Josh Mortensen, Hydraulic Engineer

Subject: Travel to Davis Dam to scope additional turbulence field testing options.

1. Travel period: 10 October 2012 – 11 October 2012
2. Places or offices visited: Davis Dam
3. Purpose of trip: To identify and evaluate test location options for additional field testing for turbulence research project 9829. Testing at a new location is necessary because previous test results were biased due to air entrainment within the previous test setup in the unwatering gallery.
4. Synopsis of trip: The morning of Wednesday, October 10th Josh Mortensen met with Sherri Pucherelli and Vince Lammers to discuss test setup options that would meet required test parameters and not interfere with operation and maintenance at the dam. Leonard Willett, who was scheduled to attend, was not able to be there. Optional locations for the new test setup included a 3-inch cooling line to the generator thrust bearing, a 4-inch cooling line to AC units, an 8- to 6-inch transition section currently occupied by decommissioned cooling water booster pumps, and outside pumping out of the forebay. Each option was discussed from both testing and O&M points of view.

After discussing and looking at each option, Sherri returned to her office in Boulder City and Josh remained at Davis Dam to acquire flow data, physical dimensions, and photos of each test option. A Controlotron Model 1010 flow computer was used with size D2 transducers mounted in reflect mode to measure flow through the 3-inch PVC thrust bearing cooling water lines (Figure 1). Flow measurements were made on the 3-inch piping of units 1, 2, and 4 as they were all PVC pipe. No measurements were attempted on units 3 and 5, or on piping for the other test options due to space limitations and previous issues with low acoustic signal strength through aged steel piping within Davis Dam. Average flows of 163.3, 162.2, and 152.2 gallons per minute were measured for units 1, 2, and 4, respectively. The low forebay water surface elevation (El. 637.75 ft on October 10, 2012) may be the reason these values are lower than the 185 gallons per minute measured previously on unit 4 (El. 644.00 ft on January 14, 2011). Regardless, Controlotron measurements indicated that the percentage of air in these pipes was negligible and flows are likely sufficient for a turbulence research test setup at this location.

On Thursday morning Josh returned to Davis Dam to finish documenting the physical dimensions of the test options and to inspect some of the test equipment from previous

turbulence testing. Also, before leaving Josh and Vince discussed findings from the site visit, as well as plans necessary to move forward. At about 11:00 a.m. Josh departed for the Las Vegas airport.

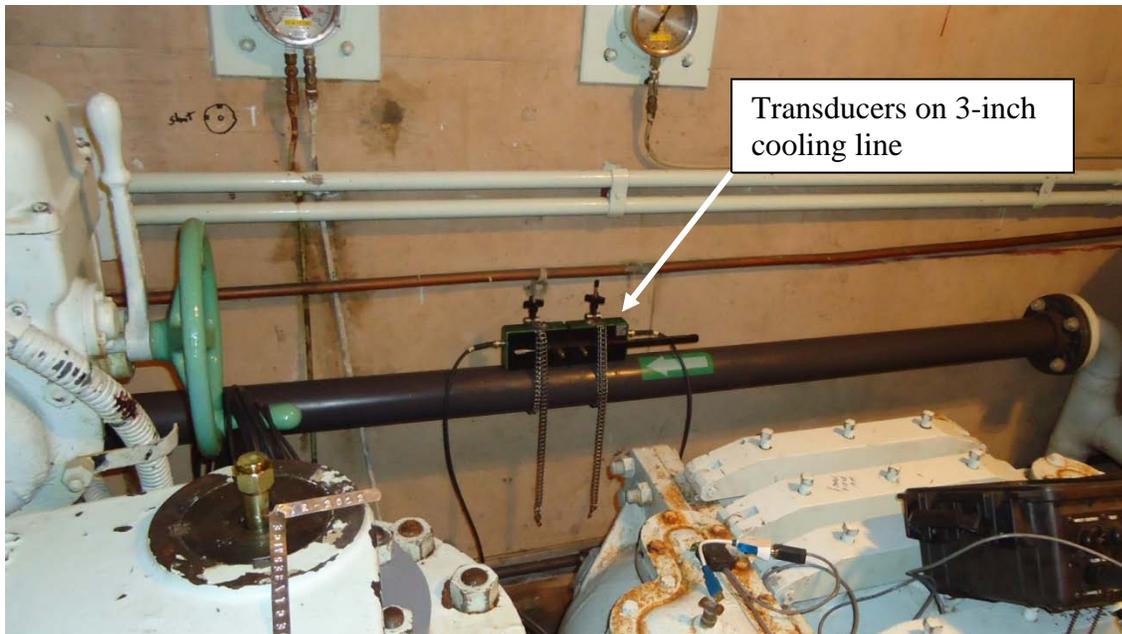


Figure 1 Transducers used to measure flow on Unit 4's 3-inch PVC cooling line to the unit generator thrust bearing.

5. Conclusions: The 3-inch cooling line on level 2 (El. 528.0 gallery) that provides flow to the generator thrust bearing (Figure 2) is the most likely option for the proposed test setup. This option will likely allow adequate operation required for both hydraulic and biological test parameters while not interfering with routine operation and maintenance of the existing cooling system. It is also the least complicated test system to install and operate, which would reduce the cost for the research as well as reduce time and assistance required by Davis personnel compared to the other options.



Figure 2 3-inch cooling line (flow outlined by yellow arrows) to generator thrust bearing on Unit 1.

6. Action correspondence initiated or required: Once permission is obtained from Davis Dam management and research funding secured for FY13, a statement of work will be submitted to Leonard Willett who will review and send to Davis personnel.

7. Client feedback received:

cc: Leonard Willett (LCD-8200)
Vince Lammers (LCD-D11)
Sherri Pucherelli (86-68220)
Joe Kubitschek (86-68460)
Miguel Rocha (86-69000)

SIGNATURES AND SURNAMES FOR:

Travel to: Davis Dam, Bullhead City, AZ

Dates of Travel: October 10-11, 2012

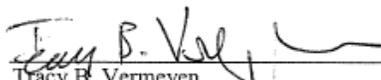
Names and Codes of Travelers: Josh Mortensen, 86-68460

Travelers:


Joshua D. Mortensen
Hydraulic Investigations and Laboratory Services Group

10/18/12
Date

Peer Review by:


Tracy B. Vermeyen
Hydraulic Investigations and Laboratory Services Group

10/19/12
Date

Noted and Dated by:


Robert F. Einhellig, Manager
Hydraulic Investigations and Laboratory Services Group

10/18/2012
Date