

A NEW IDEA

Newsletter of the Irrigation District Engineering and Assistance Program



ISSUE 3, NOVEMBER 2005

INSIDE THIS ISSUE:

Lining performance improves to 94% 2

How do we determine water savings? 2

Pipeline reduces losses by 98% 3

Assessment Program Status Report 3

Personnel News: Welcome Azimjon Nazarov 4

Fipps in Australia 4

USCID Conference 5

Central Asians Visit the Valley 5

GIS/GPS Short Courses Set for January 6

Model Database Under Development

With few exceptions, Texas irrigation districts have old, outdated databases which limit access to existing information and which make it difficult to implement web based services. The IDEA team has partnered with Delta Lake Irrigation District and Hidalgo County Irrigation District No. 2 to develop a model database and new "client" software (client software allows users to enter and retrieve information from the database).

David Flahive, System Analyst will work with a Woodlands-based software development company to develop the database client software. The districts' existing databases will be reformatted into an improved structure that will allow flexibility for future changes. *MYSQL* will be used for

the new database and the client software will be programmed in *C#*, thereby making it easy to modify as district needs change in the future.

It will take about 3 months to develop the new client software and transform the existing databases. Once completed, David will develop web-based database access and services based on the districts needs and interests. Options include web-based water ordering and an internal district website where employees can remotely access current district operations.

The two districts are covering the costs of the client software development. Other districts will be able to acquire the software through a cost-share arrangement.

Canal Automation Demonstration Program Begins

The IDEA Team received \$36,000 from the Rio Grande Basin Initiative to implement three canal automation demonstrations. The objectives are to demonstration the benefits of automatic control of gates, and to determine the equipment and software that work best in the conditions along the Rio Grande River in Texas.

Each demonstration will be equipped with a telemetry system that will transit current conditions at the gate to the district office, and receive instructions on gate settings generated by the automation software. While the basic telemetry and gate control equipment is fairly standard, we anticipate focusing most of our efforts on evaluating control software and making modifications as needed for maximizing canal operational efficiency.

The IDEA Team is looking for districts inter-



Azimjon inspects gate for automation.

ested in participating. Districts will be required to cover about half the (approximately \$18,000) costs of each the demonstration on such items as the motors and actuators needed to operate the

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Demonstration

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gate. Where needed the district will have to replace the existing gate structure with one that can be automated. The IDEA Team will cover the costs of the telemetry and automation software systems. For more information,

contact Eric Leigh at 979-458-3583. For more information on the Rio Grande Basin Initiative, see the project website at <http://riogrande.tamu.edu>.

Installation of the composite liner and shotcrete on lateral A.



Composite Lining Performance Improves

In October 2004, Hidalgo County Irrigation District No. 2 lined seven miles of their sub-main canal, Lateral A with a geomembrane product overlaid with 3 inches of shotcrete. The IDEA Team conducted its first seepage loss test about a month after the lining was completed, but the results were disappointing. While seepage losses

were greatly reduced, losses were higher than expected. One possible reason was that the shotcrete hadn't completely cured.

In July 2005, the IDEA Team re-tested the section and found that seepage losses continue to decrease. Total losses were reduced by 35% since the test in November, and a whopping 94% when compared to pre-lining conditions. Thus, the total was savings now is estimated at 882 acre-feet per year.

How Do We Determine Water Savings?

Seepage losses and the potential water savings through rehabilitation is determined using the ponding method. In this method, two ends of the canal segment are sealed with earthen dams. Staff gages are placed throughout the test segment and the water levels are recorded over a 48-hour period. During the test, the canal segment is surveyed using GPS. Using the cross-sectional

dimensions and the recorded water levels, we can calculate the water loss rate.

A "how to" manual on the ponding test method will be published early next year and a spread-sheet program will be available for the calculations. Contact Eric Leigh to request a ponding test.

Backhoes are often used to construct the earth dams.



GPS surveying of the canal cross section and the staff gauge.

Pipeline Reduces Losses by 98%

United Irrigation District and the IDEA Team are working together to ensure water savings from a new pipeline constructed in 2004. In *A New Idea* Issue 1, we reported that the repairs of this pipeline were effective, and had resulted in a water savings of about 98% when compared to losses of the original canal. The IDEA Team retested the pipeline in May 2006 and found that the repairs were still holding. The annual water savings of the pipeline is still estimated at 290 acre-feet per year. The District and the IDEA Team plan on continued testing of the pipeline every 6 months to evaluate the long-term performance of the repairs.

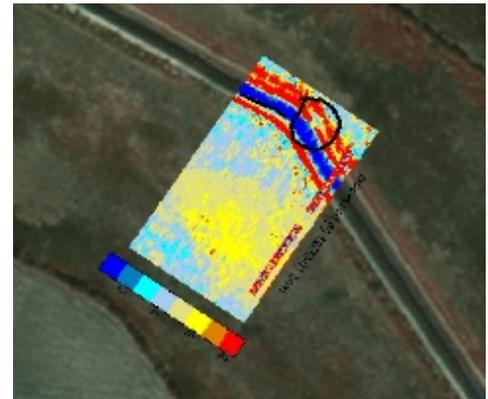


Irrigation Rapid Assessment Program - Status Report

In 2002, the IDEA Team received funding from the Bureau of Reclamation in Austin to support the development of the RAT (Rapid Assessment Tool). RAT is a combination of surveys, data collection, mapping and limited direct measurement designed to provide a quick and cost-effective analysis of the conditions of the water distribution network of irrigation districts.

The main objectives are to define and quantify the extent and seriousness of problems contributing to poor conveyance efficiency and low on-farm water use efficiency, and to help prioritize rehabilitation projects. To the degree possible, problems are quantified and related to potential water savings through rehabilitation.

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Remote sensing is being used to find leaks in the canal system.

The eight (8) components of the are as follows:

1. Leak and Seepage Loss Testing (Direct Measurement)
2. Canal Condition Rating (Indicator, Loss Estimation)
3. Analysis of Water Supply (head problems) in Districts (Indicator, System Analysis)
4. Effects of Aquatic Vegetation on Flow in Canals (Impact Control)
5. Spill Loss Evaluations (Indicator, System Management)
6. Remote Sensing Tools (Indicator)
7. Optimal Canal Water Management Procedures (System Analysis)
8. On-farm water delivery Analysis (System Analysis)



**Typical Rating Scale:
Cracks on lined canals**
 1 - sparse
 2 - greater than 10' apart
 3 - 5' to 10' apart
 4 - 3' to 5' apart



Overall Rating Score: 6.6
 Loss Rate (gal/ft²/day): 20.87
 Loss Rate (ac-ft/mi/yr): 520

Note: The report is posted on the IDEA website: <http://idea.tamu.edu>. Recently the name of the program was changed to "ICE" (Irrigation Conveyance Evaluation).

A Rating criteria for lined canals is used to help determine the canals condition severity.

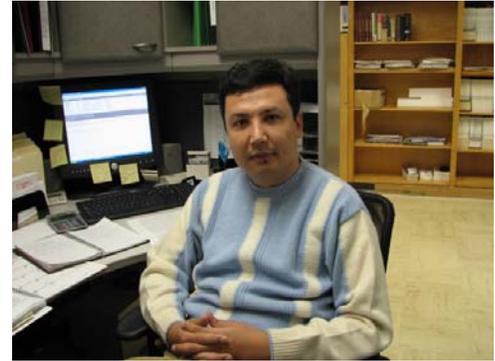
Personnel News

Azimjon Nazarov has joined the IDEA team as an Extension Associate and is officed at the Texas A&M Center in Weslaco. He received his BS in Irrigation Engineering in Uzbekistan, and a MS in Agricultural Engineering from Texas A&M University in 2000 where he studied under Dr. Guy Fipps.

Azimjon has spent the last 5 years managing a large-scale irrigation district rehabilitation project in Central Asia. This project was funded by USAID (United States Agency for International Development) at about \$50 million.

Azimjon brought his wife and son with him to Weslaco. His family is excited about living in Texas, and is enjoying the many more options

available here for recreation, shopping and entertainment. Azimjon may be reached at 979-956-5616, e-mail asnazarov@ag.tamu.edu.



Azimjon Nazarov

Fipps Travels To Australia

Dr. Fipps traveled to Australia in late October to participate in the Australia National Committee on Irrigation and Drainage annual conference where he presented a paper on development of the Irrigation Conveyance Evaluation program (see article in this newsletter). The Conference also marked the 150th anniversary of irrigation in Australia.

Besides the conference, his main purpose was to tour the Goulburn-Murray Water Dis-



Australians use a unique water wheel system for measuring on-farm flow.

trict's extensive rehabilitation and modernization projects.

Earlier this year, the district automated 420 sites with flume gates to improve canal management and reduce spills and other losses. Dr. Fipps believes that these flume gates have great potential for use in Texas.

Flume Gates



Leigh and Nazarov Attend USCID Conference

In October, Eric Leigh and Azimjon Nazarov traveled to Vancouver, Washington (located near Portland, OR) to participate in the USCID (United States Commit-



tee on Irrigation and Drainage) conference on SCADA (Supervisory Control and Data Acquisition). Azimjon presented a paper on the IDEA Team's plan for automation of gates in Delta Lakes Irrigation District. This is one of three canal automation demonstrations being implemented as part of the Rio Grande Basin Initiative (see article in this newsletter).

The poster was titled: "Delta Lake Irrigation District Canal Automation Project" and can be viewed on the IDEA website at <http://idea.tamu.edu>.



Seal of the USCID

Central Asians Visit the Valley

In March 2005, the IDEA Team conducted a 3-day workshop for a group of 15 water professionals from the nations of Kazakhstan, Uzbekistan, Tajikistan, and Turkmenistan. The group was composed of directors of water resources departments, managers of irrigation districts, and engineers who were participating in a month long study tour of the United States.

In the Valley, the participants learned about our international water policies and treaties, irrigation schemes and management practices, and toured practical implementations of modern technologies for district improvement, including automation of gates, flow meters, canal linings and other district network improvements.

Special thanks to Joe Barrera and the staff of Brownsville ID, Alan Moore of CC Drainage District #55, Frank Ruiz and the crew of CCID#6, Jorge Diego of CCID#2, HCCID# 9, HCID#2 and Harlingen ID for their assistance in making the workshop a success.

The workshop was conducted in cooperation with SABIT (Special American Business Internship Training) which is a program of the International Trade Administration, U.S. Department of Commerce. Information about SABIT can be found at www.mac.doc.gov/sabit.



Eric Leigh and Martin Barroso demonstrate the use of GPS survey equipment during a ponding test.



Alan Moore, Askar Karimov, and participants at the Los Fresnos weir.



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The Irrigation District Engineering and Assistance Program is under the direction of Dr. Guy Fipps and is a program of the Irrigation Technology Center, a center of the Texas Water Resources Institute, Texas A&M University System, administered through Texas Cooperative Extension and the Texas Agricultural Experiment Station. IDEA Team members include Eric Leigh, David Flahive, Yanbo Huang, Askar Karimov, and Azim Nazarov.

This material is based upon work supported by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture under Agreement No. 2005-45049-03209. For program information, see <http://riogrande.tamu.edu>.

GIS/GPS Short Courses Set for January

The IDEA team will be offering two short courses in January 2006. The 1-day GPS course on how to operate survey and consumer grade GPS software will be offered in Weslaco. We will also be holding a 2-day GIS (Geographical Information Systems) course in College Station. To register for a class or for more information see the IDEA Website <http://idea.tamu.edu>.

GPS (Global Positioning Systems)

This is a beginner's class on how to use GPS equipment for mapping and surveying. Students will receive "hands-on" training on a Trimble 5700 GPS Total Station. Prior experience with GPS or surveying equipment is not necessary.

When: January 5, 2006

Location: The Texas A&M Research & Extension Center in Weslaco, Texas.

GIS (Geographically Information Systems)

This is a beginner's class on how to use GIS software for mapping and management. Students will receive training on how to use ArcGIS 9.1. Prior experience with GIS is not necessary. The class will be held in a computer lab on the Texas A&M University campus.

When: January 11–12, 2006

Location: Texas A&M University, Scoates Hall, College Station, Texas.