

'Techno-Junkies' Saving Water at Roza Dam

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Photo #1: New computer controls regulate this 110-foot-long gate at the Roza Dam to modify the flow of water through the dam into the Yakima River. The new controls help maintain a more consistent flow of water into the river, which, in turn, helps fishery managers and irrigators and saves water.

Mark Pettit leaned back in his chair to ponder the question.

Just how would he describe himself and fellow federal Bureau of Reclamation employee Charles Rinker?

Soon, his face brightened.

"Techno-junkies," he responded. "It's a great time to be a techno-junkie."

So it is, even in the water business, where expanding technology is being employed to better manage water, from irrigation storage dams high in the Cascades to diversion dams on the Valley floor.

The result of these advancements, essentially creating more storage by saving water, approaches a goal that has eluded politicians and planners for decades. No new storage has been created in the Yakima Valley since the 1930s.

Some of that technology is in the form of more modern remote controls that help save water and money for basin water users. Another benefit is better management of river flows to protect fish.

Electrical engineer Mark Pettit, left, and electronics technician Charles Rinker devised the gate control system.

The Yakima-Tieton Irrigation District, northwest of Yakima, for example, has used updated remote controls at its canal headgate for two years, thanks to the work of Pettit and Rinker.

Manager Rick Dieker said needed changes in canal flows can be done via computer from the district office east of Cowiche.

"It has made us more efficient. We can make changes more quickly," he said.

Rinker also has helped to create the network that gathers data on snowpack and river levels throughout the basin.

Pettit, a 55-year-old electrical engineer, and Rinker, 58, an electronics technician, are being credited with completing another of those advances this spring.

They used a new generation of electronics and computer technology to allow for finer adjustments in a huge 110-foot-long gate that controls Yakima River flows through Roza Dam, about 10 miles north of Yakima, in the Yakima River Canyon.

The cylindrical gate, one of two at Roza, is attached to gears at either end — each one several feet in diameter — that move the gate.

The old automated control system, a combination of sensors, switches and timers, couldn't be operated as tightly, meaning wider swings in river flows below Roza Dam. The fluctuating river made it more difficult to hit minimum flow targets for fish at Parker, south of Union Gap, a critical control point where federal law mandates minimum flows for protecting fish.

It was a water management problem that had existed for two decades and one that some agency higher-ups outside the Yakima Irrigation Project suggested couldn't be fixed because of the sheer size of the gates, said Tony Hargroves, storage supervisor for the bureau's Yakima Field Office.

"The goal was that the river not go up and down as much as it had and the flows be more consistent for both fish passage and the irrigation districts," he said.

Pettit and Rinker were assigned the task to find a fix. They plowed ahead when time permitted among their other duties, experimenting with a couple of different approaches.

Both men emphasize the upgrade couldn't have been possible without advice and help from others in the bureau field office, including electricians and hydrologists.

Rinker said the system now in place is a more powerful version of what is called a programmable logic controller, a device that has been available for at least a decade and is now used in a variety of industrial applications.

He said the controller has enough computing speed to be 100 times more accurate than its predecessor. The controller is connected to sensors that monitor the water level behind the dam.

The old device was capable only of making fixed changes that took longer to occur and were greater than necessary to maintain the proper level of flow and the pool size behind the dam.

"The intelligent part of it is always looking at the slope of change (in the river) and adjusting," said Rinker, a native of the Brownstown area and bureau employee for 22 years.

The result of their 18 months of on-again, off-again work on the project could save as

much as 8,000 acre-feet of water over a season.

They continued to fine-tune the device — about the size of a desk telephone — as the 2003 irrigation season got under way last week.

The estimate of water saved represents several days of deliveries for any of the large irrigation districts in the basin. In a water-short year such as 2001, the savings are magnified even more.

Stated another way, a proposal pushed several years ago to expand Lake Cle Elum to store an additional 15,000 acre-feet carried a price tag of about \$15 million.

The two longtime bureau employees saved half that much water at a relatively small investment approaching \$75,000.

Pettit, a bureau employee since 1977, said the inability to operate Roza more tightly meant more water had to be in the river below Roza to assure the target flow could be maintained at Parker.

River flows sometimes gyrated by as much as 200 cubic feet per second.

With the new controller, the swings can be held to 10 percent of that amount or less.

"With Roza tamed, the river operators can hold more water in storage," Pettit said. "It's like having more storage."



Photo 2:Electrical engineer Mark Pettit, left, and electronics technician Charles Rinker devised the gate control system.