New water-delivery system unveiled in Uzbekistan

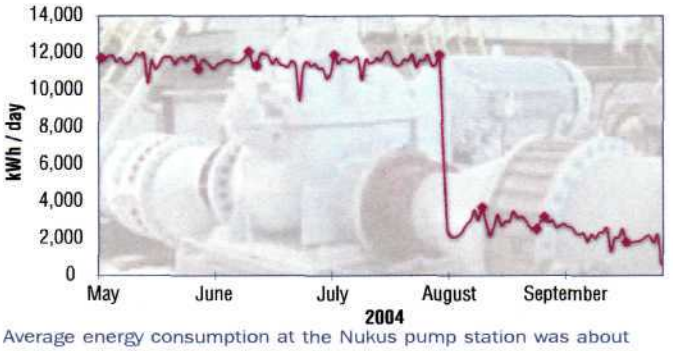
North of Nukus, Karakalpakstan, a Soviet Union-era pump station and conveyance system were fraught with problems resulting in poor delivery, extraordinary energy costs and leaky water pipes that drained local communities of this scarce resource.

Today, more than 160,000 Uzbekistanians in Nukus, Chimbai and Kegeili have a significantly improved public water system thanks to CH2M HILL's involvement in a U.S. Agency for International Development-funded program. CH2M HILL managed the two-year refurbishing of the 110-million-gallons-per-day pump station and distribution system as a subcontractor to PA Consulting. The project was completed in August.

The original system was monitored and controlled manually. It had oversized pumps which produced water pressure six times higher than the conveyance system was designed to handle. When the pumps started up, they would run at full capacity, causing pipe and pump damage as the water hammered through the conveyance system.

"The poor-performing system was unable to maintain steady pressure," said project manager Ivan Dolak. "During the daytime, when usage peaked, pressure would drop and, conversely, when usage was down at night, pressure would increase."

The mismatched system, which sometimes forced operators to pump water back to the storage reservoirs when pressure was high and consumption was low, drove up energy costs. Half of the annual operating budget for the local water utilities was consumed by energy costs.



Average energy consumption at the Nukus pump station was about 11,500 kilowatts a day prior to the system overhaul. After the new system startup in August, daily energy consumption dropped five times to about 2,300 kilowatts.

CH2M HILL's team installed two new pumps and motors, repaired the system's six other pumps and installed new conveyance piping. An all-new electrical system, including new transformers, was installed along with variable frequency drivers, which allow the pumps to run at speeds that match the demand.

The new system is entirely computerized and automated, resulting in a startling reduction in power consumption from 450 kilowatts to 80-120 kilowatts per pump.

"The concept of automated operation of pump stations is new to Uzbekistan's municipal sector," Dolak said. "The utility managers still cannot believe the ease of operation and power saved. Wishing to replicate significant power savings, several local utilities are currently considering our solution for other pump stations in Uzbekistan."

Work at the Nukus pump station included installation of new pipes, variable frequency drivers, new electrical system, new transformers, and new pumps. The CH2M HILL team also trained staff on the new automated control system. CH2M HILL managed contractors and suppliers from the United States, Russia, and Uzbekistan to complete the project.