

# Irrigation Water: A Steady Supply

By Harry Broussard

For generations, Benton County in southern Washington state has been fertile ground for agriculture. In recent years, it has become one of the largest wine-producing regions in the country. The agricultural industry demands a regular supply of water. To accommodate current irrigation needs, the Benton Irrigation District (BID) constructed a new pumping station on the Yakima River in the first part of 2010.

## Energy Efficiency

The pumping station design included six medium-voltage adjustable-frequency drives, ranging from 400 to 700 hp. BID relies on Eaton's Ampgard SC 9000 drives, which utilize highly efficient variable-speed operation. Designed for applications requiring variable power output, the drives are able to optimize energy usage by matching consumption to actual power requirements. This way BID uses only the power it needs and

the drives can gradually accelerate the motor and pump, helping protect the assets and extend equipment life.

Optimizing the operating speed of large pumps and motors can generate substantial energy and cost savings, as well as minimize the wear and tear on valuable assets. Today's drives can save water and wastewater customers more than 40% in annual energy consumption in typical medium-voltage applications. The return on investment on medium-voltage drives can be calculated in terms of months, not years.

## Critical Needs

With regional agriculture dependent on harvest and temperatures reaching upward of 110°F in the summer, a steady supply of water is crucial to BID. A dependable water supply is taken seriously: The BID foreman is on call 24 hours a day during the irrigation season to make sure the system is up and running.

Adjustable-frequency  
drives power new  
pumping station

The irrigation district's new pump station employs six medium-voltage adjustable-frequency drives.



Beyond selecting equipment with a history of reliable operation, rapid response and service was critical to the success of the project. Having field support available within 150 miles proved to be extremely convenient to get the new pumping station up and running. The drives used by BID are engineered to improve uptime and reduce mean time to repair. The SC 9000's modular roll-in/roll-out inverter makes it easy to access and service.

The electrical system was tested shortly after the pumping station began operating, when it sustained two power outages within a month. The foreman was able to get the system up and running quickly and from his home.

### Space Savings

The original plan for the electrical room included six medium-voltage variable-frequency drives inside, but due to lack of space, the design had the medium-voltage switches outside. Using compact drives smaller than those originally specified allowed those switches to be moved inside. Considering the wide range of temperature—from 20°F in the winter to the summer high of 110°F—the move helped improve the equipment life and the reliability of the system.

Additionally, the drives are engineered to be mounted up against a range of equipment. They can connect the main power bus bar, which carries voltage and current, directly out of one unit and into the other. This yields an improved aesthetic and space savings. In the BID installation, the drives were coupled directly with the switches, which was what allowed all of the gear to fit into the original room dimensions. Alternately, if the drives cannot be coupled directly with switches, a transition structure would be required to accommodate cables that would need to run from the drive to the switch.

### Meeting District Demands

Ultimately, the solution allows BID to meet its irrigation demands and plan for the success of regional agriculture. It meets demand with solutions that are designed to minimize energy consumption and work reliably for years to come. **PS**

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### Challenge:

A Washington state irrigation district needed to replace a deteriorating open canal system. This included a reliable pump station at the Yakima River to supply water for 4,630 irrigable acres crucial to the local agricultural industry.

### Solution:

A new pumping station was constructed above the river to accommodate for current and future irrigation needs with six Eaton Ampgard SC 9000 medium-voltage adjustable-frequency drives. Since the summer of 2010, the new pumping station has been bringing water to the acreage.

### Conclusion:

Energy-efficient adjustable-frequency drives maintain a steady supply of power that meets the system demand (and no more) while reducing wear and tear on valuable motor and pump assets. The compact footprint of the drives allowed for efficient and effective use of electrical room space—key for a pumping station located on a rock bluff above the river.

