

HYDRAULIC POWER UNIT & INLET VALVE PROVIDE RELIABILITY & SAFETY FOR RESERVOIR



The 66" Hilton Knife Gate Valve in the vault at the bottom of the drained reservoir.



Hilton Hydraulic Power Unit (HPU) located in the control house outside the dam.

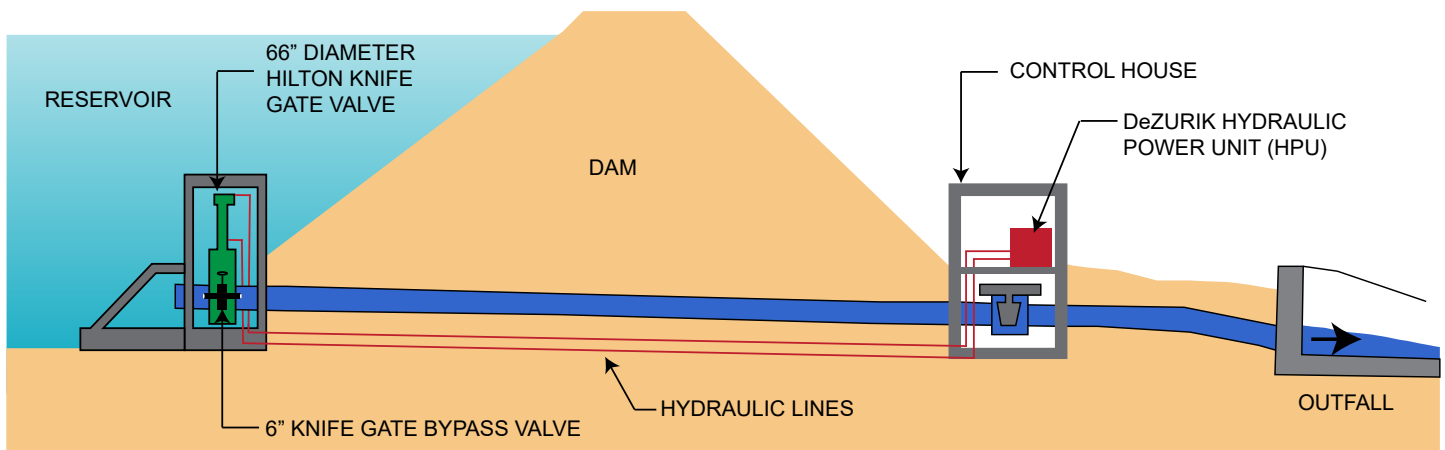
Reviewing the Challenge

A water utility in the Rocky Mountain region of the United States required a unique solution to a difficult problem. A new inlet valve needed to be installed in the main water storage reservoir that supplied the city's drinking water. The valve would be installed over one hundred feet underwater and operate from the control house on the downstream face of the dam.

The original valve, from the early 1900's, was stuck in the open position. If the valve were to get stuck in the closed position, flow to the downstream water treatment plant would be interrupted. Therefore, the new valve required an advanced control system to show the operator the orientation of the valve at all times. Safety features were also required to ensure the valve would be held in the open position without fail.

Selecting a Valve

The water utility decided to go with a complete system solution from DeZURIK. The main inlet valve was a 66" stainless-steel Hilton Throttling Knife Gate Valve, custom engineered and fabricated at DeZURIK's manufacturing plant in Redmond, Washington. Also provided was a 6" knife gate valve mounted on the 66" valve to serve as a bypass valve. The smaller valve would open first to equalize pressure in the main line prior to operating the larger main inlet valve. Operating in this sequence prevents premature wear on the larger valve caused by cavitation and erosion.



An overview of the reservoir system. The 66" inlet valve is controlled by the HPU in the control house. The inlet valve allows the conduit passing under the dam to be dewatered for inspection and also serves as an emergency shutoff valve for the reservoir.

Controlling the System

Although the valves are impressive, the heart and soul of the solution was the custom engineered DeZURIK Hydraulic Power Unit (HPU). The HPU was designed to control the two Hilton knife gate valves and one slide gate that had been previously installed.

A safety feature to hold the main inlet valve continuously in the open position was a critical element of the HPU.

The system was designed with a triple redundant hold open strategy:

1. A mechanical rod lock on the main operating shaft of the inlet valve.
2. A hydraulic lock in the main cylinder.
3. An accumulator providing constant hydraulic pressure into the system.

Each of these features provides feedback to the control system. The logic in the control system allows closure of the main valve when the safety features were disengaged in a specific sequence. At the customer's request, the position sensor on the main valve measures the volume of hydraulic fluid acting on the system.

The entire HPU system fit into a uniquely shaped area in the existing building, allowing full access to all components and walkway.

DeZURIK was proud to provide a complete system solution that included valves, the HPU and the control system. Combined and tested together, these are ready to perform reliably for the next 100 years.



A crane lowers the 66" Hilton Knife Gate Valve down into the vault at the bottom of the reservoir.

SALES AND SERVICE

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