

ECENTRIC PLUG VALVE ACCURATELY CONTROLS FLOW FOR FISH LADDER ATTRACTION POOL

A West Coast engineering firm was designing a fish ladder as part of a water supply project for a public utility district. A fish ladder, constructed beside a dam, allows migratory salmon and steelhead to bypass the dam and safely reach their spawning grounds upstream. The fish ladder creates a series of ascending pools that allow the fish to swim from pool to pool until they reach the river above the dam. Water flow at the proper velocity at the entrance pool of the fish ladder is critical to attracting fish to enter the fish ladder. The utility district needed a control valve that would provide high flow capacity and handle the high velocity required by this application.

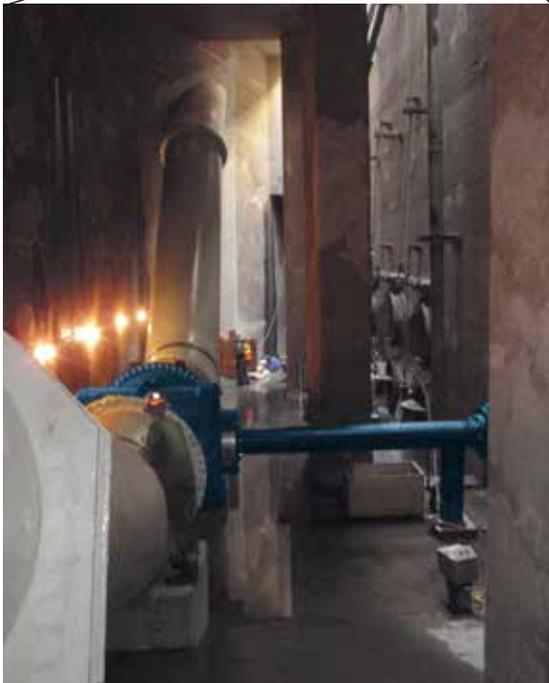
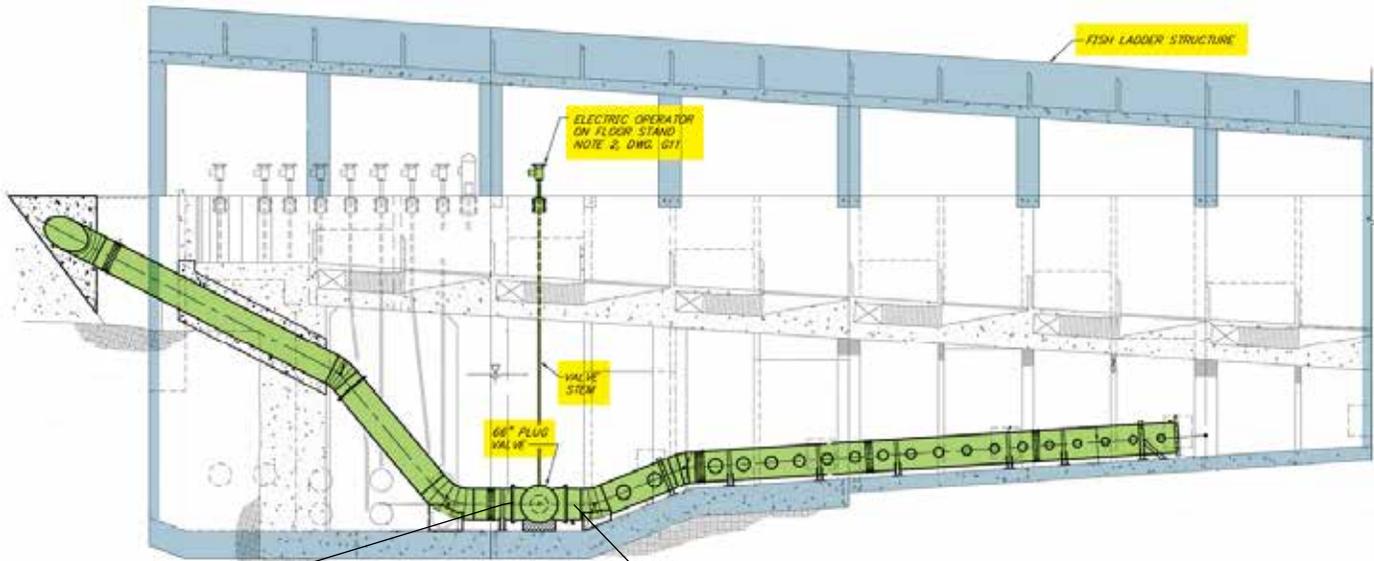
The attraction water supply for the fish ladder design included a 66" diameter pipeline with a control valve and separate isolation valve. The control valve was required to provide level control for the fish ladder supply pool water. The utility district maintains a six foot elevation head differential with the control valve to provide proper flow velocity across the fish ladder "steps" for the fish to swim up and over the ladder steps.

The DeZURIK Eccentric Plug Valve was found to be an ideal control valve choice due to the high velocity and potential cavitation in this application. The maximum velocity at high flow was 38 feet / second with head pressure of 50 psi. Because the eccentric plug valve features low dynamic torque and cavitation resistance, it could handle the velocity of the pipeline. A butterfly valve was considered for the valve application, but was rejected due to the high velocity. All other valve designs the engineers flow modeled required much more costly piping design to accommodate the high velocity and pressure drop.



An aerial view of the fish ladder and the attraction pool. The water supply for the attraction pool is controlled with a 66" DeZURIK Eccentric Plug Valve.

Diagram shows the 66" DeZURIK Eccentric Plug Valve connected by a 55' neck extension to a modulating electric motor actuator mounted on a floorstand.



A 66" Eccentric Plug Valve with a gear unit and a modulating electric motor actuator with manual override was installed. The actuator was mounted on a floorstand connected by a 55 foot neck extension to the valve in the pipeline below the fish ladder. The valve was installed per DeZURIK's recommendation with the plug shaft horizontal and seat downstream, flow-to-close. This orientation was based on flow modeling to offer the longest valve service life. The 66" DeZURIK Plug Valve met the utility's complete punch list of goals by providing a reliable control valve solution that will endure the test of time.

The Eccentric Plug Valve was found to be the ideal valve choice due to the high velocity and potential cavitation in this application.

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