

Big Cliff Spillway Gate Rehabilitation

Big Cliff Dam was constructed in 1953 and is located in the Willamette River drainage basin, on the North Santiam River. Big Cliff Dam is a 172-foot-high, 295-foot-long concrete gravity dam with 3 spillway control tainter gates and a one-unit powerhouse. It is the re-regulating dam for the upstream Detroit Project.

This proposed project will upgrade the three spillway gates at Big Cliff to restore their integrity and reliability in accordance with current codes, design criteria, and standards. Structural inspections have identified deformed members (bent strut arms) on all three spillway gates, which indicate that the gates have been overstressed. As a result, interim risk reduction measures have been implemented. These include pool restrictions (pool elevation not to exceed the elevation of the top strut at 1193 feet) down 13 feet from normal, as well as operation limitations. The operation limitations require that an operator visually confirm the tainter gate is opening to the required elevation without strain or damage, in-lieu-of remote gate operations. These procedures increase the potential for intervention, prevent an uncontrolled release, minimize risks to property damage and life safety, and meet environmental stewardship responsibilities.

During the project, spillway tainter gate girders, strut arms, bracing members and related structural components will be removed and replaced with larger structural members and high strength steel components. Existing welds will be inspected and deficient welds will be replaced. The trunnion bearings, thrust washer, seals and components will be replaced. Recommendations from the Comprehensive Risk Assessment on electrical and mechanical system rehabilitations will be implemented. The project includes design and construction for the tainter gate structural, electrical, control, protective coating systems, and mechanical rehabilitation. Information gained from this project will help inform the last phase of the Comprehensive Spillway Tainter Gate Study. That study has completed an evaluation of spillway gate condition across the Portland District of the Corps and, in its final phase, will produce a prioritized ranking for rehabilitation of the remaining gates.