

Lower Granite Unit 1 Linkage Upgrade

This investment will refurbish the U1 turbine runner linkage at Lower Granite and return it to full Kaplan (adjustable) capability.

On January 10, 2012, a contractor performing non-destructive testing on Lower Granite Unit 1 found that 9 of 12 linkage pins were cracked. Work was performed to block the blades in a static position to eliminate potential catastrophic failure of one or multiple turbine blades. Blocking the blades in a fixed position limits the operational flexibility of the unit, confining operation to a narrow window of hydraulic flow conditions.

Unit 1 belongs to a family of turbines that are susceptible to linkage cracks. All of these units in the FCRPS have been evaluated to determine which of them should be repaired to return the units to their original fully adjustable Kaplan design. Lower Granite Unit 1 was identified as one that should be returned to full Kaplan functionality.

Unit 1 is a fish priority unit and requires maximum operational flexibility to enhance fish passage. The ability to run the unit in full Kaplan operation is critical for variable load response and restores the unit to its original intended purpose. Operating as a fixed blade unit at the upper end of the 1% range adversely affects fish migration during low flow times of the year.