

John Day Turbine Hub Upgrades

The sixteen turbine runners at John Day are Kaplan (adjustable blade) runners of the Baldwin-Lima-Hamilton (BLH) design. The BLH units have a known design flaw in the linkage pins which allows fatigue cracks to grow until the pins become brittle and suddenly fail. Additional flaws exist in the linkages, eye ends, and other hub components. Unit 16 suffered a linkage pin failure in 2006 and has been repaired to full capability. Units 5 and 11 were forced out of service in 2011 and were returned to service with their blades fixed in a static position. Both recent failures are believed to be due to fracture of the blade adjustment mechanism (pins, linkages, or eye ends).

There have also been O-ring failures with these units, which cause the units to leak oil. This potential environmental problem has required the oil to be drained from the hubs of some units. Once the oil is drained, the blades must be operated in a fixed position.

A 2012 study determined that up to six units could be converted to a fixed blade configuration with minimal operational impacts (the adjustable blades provide operational flexibility and maximize efficiency). This project will implement the recommendation of that study. Nine units will be rehabilitated to full Kaplan capability (one unit was previously rehabilitated). The remaining units will likely be pinned in a static position. Detailed inspections will be undertaken to determine what rehabilitation measures will be taken for each unit. Units with oil leakage issues will be given priority.