

Lower Granite MU2 Blade Sleeve Upgrade

This project seeks to rehabilitate and upgrade the Main Unit 2 Blade Sleeve at Lower Granite Dam.

This project includes a permanent upgrade to each of the 6 blade packing sleeves on main hydropower generating unit 2 (Unit 2) at Lower Granite dam and reservoir project (Lower Granite). A blade packing sleeve is a pipe that fits closely over the trunnion (shaft) of the turbine blade that allows the blade to be able to rotate and not damage the blade packing (a seal that is located on the outside of the blade) and the blade trunnion surface. The blade packing sleeve seals the oil in the turbine hub (a component that facilitates the simultaneous movement of the blades and requires oil lubrication). On December 12, 2016, one of Unit 2's blade packing sleeves failed, resulting in oil entering the lower Snake River. This oil spill was reported to the U.S. Coast Guard National Response Center that day per the Corps Walla Walla District's (NWW) Spill Prevention, Control and Countermeasure plan. Unit 2 was taken out of service to prevent additional oil entering the river. Unit 2 underwent an interim repair to ensure that the unit was in operation to support high spring run-off and provide attraction flow for adult fish passage through Lower Granite's south shore fish ladder, including fish listed under the Endangered Species Act (ESA). It was critical for Unit 2 to be operational because Unit 1 was out of service for repairs during the 2017 fish passage season. The permanent upgrade of Unit 2 will include unstacking the unit to remove all 6 blades and upgrade of the blade packing sleeve material on all 6 blades. This upgrade will ensure that Unit 2 is a fully adjustable Kaplan unit, which allows the unit to operate efficiently across differing flow levels and within the $\pm 1\%$ turbine efficiency operating range and will minimize the risk of future failure.