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Federal partners unveil safer, more efficient turbine at Ice Harbor Dam

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BURBANK, Wash. – An advanced-technology turbine, designed to improve fish passage at federal dams on the Columbia and Snake rivers is being installed at Ice Harbor Lock and Dam in southeast Washington state.

The \$58 million project, funded by BPA, calls for runner replacements on two turbines, one fixed-blade, one adjustable, along with fish passageway improvements at Ice Harbor over the next few years.

The first turbine is set to be operational within 12 to 14 months. The work includes structural modifications to the turbine draft tube exits to improve hydraulic conditions for fish. The contracts also contain options to fabricate and install a third turbine runner.

The turbine design and installation is a collaboration between contractor, Voith Hydro Inc. of York, Pa., the U.S. Army Corps of Engineers, the Bonneville Power Administration and NOAA Fisheries. Small-scale model testing of the new fixed-blade runner design indicates it may also increase power generation by 3 to 4 percent.

“After 50 years of operation and increasing maintenance requirements, the need to replace the existing turbine runners at Ice Harbor presented the opportunity to pursue new turbine runner designs with fish passage improvement as a priority,” said Kevin Crum, project manager.

Voith Hydro Inc. used digital and physical models, and multiple design cycles to settle on two styles of high-tech runners, (turbine runners are the parts that rotate in water to generate power). The turbine runners are made of stainless steel to fight water corrosion.



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BPA engineer George Brown called the work an “excellent example of collaboration among BPA, the Corps, NOAA and a capable contractor.”

“The key ingredient holding us all together is the goal of creating meaningful improvements to the environmental performance of a critical Northwest power resource,” Brown says. “The efficiency and reliability benefits to the hydroelectric system are an important bonus, stretching the value of the limited water resource.”

Advanced-technology turbines could eventually extend beyond Ice Harbor to replace aging infrastructure at other Columbia and Snake river dams.

The latest monitoring shows that less than 10 percent of all migrating juvenile salmon and steelhead pass through turbines on the Snake river, depending on the dam and the species of fish. At Ice Harbor Dam that number is between 0.5 to 8.6 percent. Most out-migrating fish use surface passage, such as spillway weirs, on their way to the ocean. About 93 to 96 percent of all young salmon and steelhead now survive passage at each dam in the Federal Columbia River Power System.

For more information about the Ice Harbor turbine runner design and other programs to benefit Columbia River salmon and steelhead, please visit the [Walla Walla District's homepage](#) and www.salmonrecovery.gov.

About BPA

The Bonneville Power Administration, headquartered in Portland, Ore., is a nonprofit federal power marketer that sells wholesale electricity from 31 federal dams and one nuclear plant to 142 electric utilities, serving millions of consumers and businesses in Washington, Oregon, Idaho, western Montana and parts of California, Nevada, Utah and Wyoming. BPA delivers power via more than 15,000 circuit miles of lines and 261 substations to 475 transmission customers. In all, BPA markets about a third of the electricity consumed in the Northwest and operates three-quarters of the region's high-voltage transmission grid. BPA also funds one of the largest fish and wildlife programs in the world, and, with its partners, pursues cost-effective energy savings and operational solutions that help maintain affordable, reliable and carbon-free electric power for the Northwest. www.bpa.gov

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