



Journal

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Second-largest dam in the nation becomes more powerful, efficient



Retiring 16 turbine runners, including the one above, and replacing them with more efficient models will increase the capacity of the dam by 6.5 percent, generating more clean electricity from the same volume of water.

The Pacific Northwest is getting a boost to its supply of clean electricity thanks to a major upgrade at the second-largest hydropower dam in the country.

Most people know Grand Coulee Dam, the mightiest hydroelectric facility in the nation. Yet few would recognize its closest counterpart, Chief Joseph Dam, 50 miles down the Columbia River near Bridgeport, Wash.

“I’ve actually had people drive right past the dam — and it’s a mile long — then turn around and ask me, ‘Where’s the dam?’” says engineer Scott Bennett of the U.S. Army Corps of Engineers.

Unlike Grand Coulee, the nation’s No. 2 dam was never immortalized in song by Woody Guthrie. NASA doesn’t call it out from space as a major terrestrial landmark, and it doesn’t host a laser show beloved by international tourists.

Hiding in plain sight in a central Washington landscape better known for producing tasty apples than carbon-free energy, Chief Joseph Dam operates quietly and reliably to provide up to 2,458 megawatts of renewable power. That’s enough electricity to single-handedly power the entire Seattle metropolitan area, and there’s more to come between now and 2017.

“Chief Joe is the unsung hero of the mainstem Columbia power plants,” says Scott Lynn, who was its chief of operations before joining the Bonneville Power Administration this year.

Out of the limelight, interesting things have been taking place over the past five years at the biggest dam no one’s heard of. Ratepayers of the federal nonprofit BPA are funding \$168 million of work to replace 16 massive hydroelectric turbine runners in the 60-year-old plant, which is owned and operated by the Corps of Engineers. The runner is the part of the turbine that turns under the force of the water to transform the mechanical energy of the river into electricity.

The Columbia Basin just endured one of the driest summers on record. The dam upgrades will help the agencies that operate the

hydropower system produce more clean energy while protecting natural resources such as salmon and steelhead.

“We’re starting to see an increase in reliability, and at the same time, we’re making a wise investment in efficiency improvements,” says Joseph Summers, Chief Joseph Dam’s operations power manager. “So for the same amount of water, we’re getting more power.”

The fleet of new stainless steel turbines — each 16 ½ feet across and weighing 90,000 to 112,000 pounds — will increase Chief Joseph’s muscle by 6.5 percent. That’s a large gain for any hydropower plant, but at the second-largest plant in the country, it amounts to 53 average megawatts, or enough to power 39,000 homes. More efficient turbines also experience less wear, reducing maintenance costs that otherwise add to power rates.

The extra power generated by Chief Joseph’s high-efficiency turbines offers an added benefit to Oregon public utilities because it qualifies under the state’s renewable energy portfolio standards, which certify new green energy sources.

The state-of-the-art turbine runners, designed and manufactured by Alstom, began as beach-ball-sized scale



models tested in Grenoble, France. The full-scale versions are cast in pieces in China and Slovenia, then assembled and finished at Alstom's manufacturing facility in Quebec.

Each huge runner takes a weather-sensitive, international road trip to the dam by semi-truck. The journey climaxes in a 45-ton, thread-the-needle trick as the turbine is delicately trundled across the dam's service deck with just a foot to spare on each side.

Then the real fun begins, assembling giant components that are designed to spin 100 times per minute within a hair's breadth — exactly six-hundredths of an inch — of a concrete structure that dates to 1955. Despite the scale and complexity of the tasks, the replacement project has stayed on or ahead of schedule, unfolding with a high level of safety and effective teamwork, project managers say.

The dams of the FCRPS were built in the early to mid-20th century. After decades of vigorous and dependable service, the majority of mechanical equipment has reached the era of renewal. The runner replacement at Chief Joseph is among more than \$2 billion in total investments by BPA over the past decade to sustain the value of the system for the next half century.

In most parts of the country, the amount of power made at Chief Joseph Dam would require several gas or coal plants,

with the associated air pollution and impacts on health. At Chief Joseph and the other 30 dams of the FCRPS, the electricity is generated as a carbon-free byproduct of gravity acting on snowmelt and precipitation as the Columbia River flows to the sea.

"These facilities provide a lot of benefits to the region," Summers says. "The region needs energy, and because we don't have to have natural gas and coal (plants), our air's cleaner. And one thing that's especially important at Chief Joe is how the plant is operated in support of wind power."

As wind energy has stepped into the spotlight, the dams have played the role of best supporting actor, balancing fluctuations in wind generation to keep the power grid stable. Chief Joseph also shoulders key responsibilities in the river system for regulating water flows to protect endangered fish downstream.

As evidenced by its FCRPS awards for performance and consistency, peers in the hydropower industry recognize the value of Chief Joseph Dam. But in the eyes of the outside world, Grand Coulee remains the international marvel while Chief Joseph provides its heavy lifting under the radar.

That's just part of being a team, on a one-of-a-kind scale. "To be honest," Summers says, "most of us like it that way."

BPA celebrates protection of Lemhi River fish and wildlife habitat

In late October, representatives of the Idaho Office of Species Conservation, the Lemhi Regional Land Trust, Leadore Land Partners and the Bonneville Power Administration celebrated a historic land conservation easement that safeguards more than half of the spawning habitat for endangered salmon and steelhead in Idaho's Lemhi River basin.

Funded by the Bonneville Power Administration and the state of Idaho, the conservation easement permanently conserves working ranch lands and protects 10 miles of in-stream riparian habitat along the mainstem of the Lemhi River and its tributaries near Leadore, Idaho.

Under the easement, the property owner retains title to his land and its traditional uses as a working ranch. However, the land's sensitive habitat, needed by endangered salmon and steelhead, is protected from activity that could degrade it. In addition, the Lemhi Regional Land Trust is working with the landowner to develop a habitat management plan that safeguards and enhances existing fish and wildlife habitat.

BPA funded the project under the 2008 Columbia Basin Fish Accords, which supports mitigation for the Columbia and Snake river dams. The Idaho Accord, signed by the state of Idaho, BPA, the U.S. Army Corps of Engineers and the Bureau of Reclamation, provides \$41.3 million for the permanent protection of fish and wildlife habitat through land purchases and conservation easements. In addition,



This historic land conservation easement, funded by BPA and the State of Idaho, protects 10 miles of in-stream riparian habitat along the mainstem of the Lemhi River and its tributaries.

the agreement provides capital funding for expansion of the Snake River Sockeye Hatchery Program. Snake River sockeye are listed under the Endangered Species Act.

"The protection of this critical habitat for fish is great news for everyone who values the region's iconic salmon runs," said BPA Deputy Administrator Greg Delwiche. "The BPA funding of this conservation easement is a strategic investment of ratepayer funds that will go a long way toward the rebuilding of our endangered stocks of salmon and steelhead."

Conservation of habitat is just one component of a broader federal strategy to improve conditions for salmon and steelhead throughout the Pacific Northwest.

BPA Annual Report 2015



To read the annual report, go to www.bpa.gov/Finance/FinancialInformation/AnnualReports/Pages/default.aspx.

This year's annual report, called "Path to Success," provides a multifaceted snapshot of all the work the Bonneville Power Administration accomplished in fiscal year 2015. It also details the sound financial underpinnings that keep BPA moving forward in its varied and important missions around the Northwest.

Despite the challenges of managing dry-year conditions in the Columbia Basin with federal and Canadian partners, BPA achieved successful financial results and made its U.S. Treasury payment on time and in full for the 32nd consecutive year. BPA adjusted net revenues for fiscal year 2015 were \$143 million. Power Services' modified net revenues

were \$43 million, and Transmission Services' reported net revenues were \$99 million. Total FCRPS operating revenues were \$3.4 billion.

To introduce the annual report, Administrator Elliot Mainzer reports on the agency's progress in five strategic focus areas: our people; sustainable rates and finances; physical assets; reliable, efficient and flexible system operations; and the natural environment. While each is profoundly important, one rises above the rest in Mainzer's view.

"Our accomplishments in 2015 would not have been possible without our people — the source of every past success and the force behind our future," Mainzer writes. "... I'm honored to lead such a skilled workforce that's dedicated to our public service mission, and I look forward to the possibilities that lie ahead for us."

"Path to Success" also documents BPA's progress on an array of high-profile infrastructure improvements.

To see BPA's past annual reports, including the 2014 edition that recently won a first-place Excellence in Communication Award from the Northwest Public Power Association, go to www.bpa.gov/Finance/FinancialInformation/AnnualReports/Pages/Prior-Fiscal-Years.aspx.

Public Involvement [Updates & Notices]

BPA PROJECTS

Focus 2028 [Regionwide]

BPA would like to hear from you about future Focus 2028 discussion topics. BPA will accept comments through Dec. 9, 2015. After our Nov. 4, 2015, kickoff, we identified topics for the February 2016 forum. During the Nov. 18, 2015, scoping discussion, we heard your input and feedback on other potential topics. We know that some ideas are more easily shared in writing than on a conference call or in a regional meeting. As a recap, draft topics for the February 2016 forum include: financial health metrics and policies; cost management practices; and program-specific topics spanning Fish and Wildlife, Energy Efficiency, Transmission and investments in the federal hydropower system. Please take this opportunity to share additional topics, landscape trends or threats to the energy industry for us to consider in scoping the Focus 2028 discussions. Your input will better enable us to identify opportunities, timing and forums for future policy, program and funding decisions.

Power

Alcoa Remand Public Process [Regionwide]

BPA accepted public input and comment to assist in its response to the decision issued Sept. 18, 2014, by the U.S. Court of Appeals for the Ninth Circuit. The ruling in *Industrial Customers of Northwest Utilities, et al. v. Bonneville Power Administration* related to BPA's contracts with its direct service industry customers. In its decision, the court instructed BPA to address four specific questions regarding service to Alcoa and the recovery of funds. BPA issued a draft

record of decision on Sept. 4, 2015 and accepted comments through Oct. 9, 2015. Comments received will assist BPA in its decision-making before issuing a final record of decision on Dec. 11, 2015. For more information, go to www.bpa.gov/power/pl/regionaldialogue/implementation/Documents/DSI.SHTML.

Frequency Response Reserves [Regionwide]

BPA intends to offer a new frequency response reserves product in accordance with public preference and Northwest preference to balancing authorities. Balancing authorities in the Northwest will have a first right to purchase the product, which may be offered extra-regionally if there is additional capacity available and insufficient demand in the Northwest. Public comments were accepted through Nov. 13, 2015. For more information, go to www.bpa.gov/power/psb/dailyoffer/daily.shtml.

Cost verification for fiscal year 2015 Slice true-up adjustment charge [Regionwide]

BPA is accepting comments through Dec. 10 on the composite cost pool true-up table and the Slice true-up adjustment, which reflects the pertinent actual expenses and revenue credits for fiscal year 2015. BPA will consider the identification of any Slice true-up adjustment issues for inclusion in the agreed-upon procedures, which are miscellaneous financial services provided to BPA by an external auditor. BPA will draft the tasks to be included in the agreed-upon procedures to address any identified issues no later than Dec. 18. The fiscal year 2015 composite cost pool savings, when compared to the rate case forecast, is \$144.72 million. As a result the FY 2015 Slice true-up adjustment that is applicable to Slice customers is a credit of \$40.4 million. For more information, go to www.bpa.gov/goto/costverification.

Public Involvement continued [updates & Notices]

TRANSMISSION

Midway-Moxee Rebuild and Midway-Grandview Upgrade Transmission Line Project [Benton and Yakima Counties, Wash.]

BPA accepted comments on a draft environmental assessment for the proposed Midway-Moxee Rebuild and Midway-Grandview Upgrade project through Oct. 9, 2015. The 115-kV lines, which are deteriorating due to age and exposure to weather, need to be rebuilt to ensure reliable electric service. The Bureau of Land Management is a cooperating agency with BPA for the EA. For more information, go to www.bpa.gov/goto/MidMoxGrand.

I-5 Corridor Reinforcement Project [Cowlitz, Clark counties, Wash.; Multnomah County, Ore.]

BPA expects to release a final environmental impact statement in late 2015 followed by a record of decision in 2016. If BPA decides to build the project, it would then focus on negotiating acquisition of the required easements from property owners and obtaining permits. For more information, go to www.bpa.gov/goto/i5.

ENVIRONMENT, FISH AND WILDLIFE

Melvin R. Sampson Hatchery, Yakima Basin Coho Project [Kittitas County, Wash.]

BPA has initiated scoping on a proposal to fund the Confederated Tribes and Bands of the Yakama Nation to build and operate a hatchery near Ellensburg, Wash. The hatchery would rear coho salmon for harvest and to aid in natural spawning. The coho salmon would be released into the tributaries and mainstem reaches of the Yakima and Naches rivers. The Notice of Availability initiating scoping was published in the Federal Register on Nov. 16, 2015. As part of the scoping period, BPA will host a public meeting in Ellensburg, Wash., on Dec. 9, 2015, where project information, maps and project team members will be available. The scoping period will end on Jan. 4, 2016. For more information, contact Dave Goodman at 503-230-4764.

Steigerwald Flood Plain Restoration Project [Clark County, Wash.]

BPA is proposing to fund the Steigerwald Floodplain Restoration Project, which is located at the Steigerwald National Wildlife Refuge in Clark County, Wash. The project would involve reconnecting Gibbons Creek to the Columbia River, and is intended to improve water quality and habitat to benefit steelhead and cutthroat trout; chinook, coho and chum salmon; and Pacific and western brook lamprey. Scoping is expected to occur in December and January. For more information, contact Dave Goodman at 503-230-4764.

Early Winters 3 Coho Acclimation Site [Okanogan County, Wash.]

BPA began scoping on a proposal to fund the Confederated Tribes and Bands of the Yakama Nation to build and operate two acclimation ponds near Early Winters Creek in Okanogan County, Wash. The ponds would be used to acclimate hatchery raised coho salmon smolts as part of the Mid Columbia Coho Restoration Program. The proposed Early Winters 3 site would replace sites that are no longer being considered that were identified in the Mid-Columbia Coho Restoration EIS completed in 2012. Up to 75,000 hatchery reared juvenile coho smolts would acclimate in the pond from March to May of each year, for eventual release into Early Winters Creek. The scoping began Nov. 20 and comments will be accepted until Dec. 23. For more information, go to www.bpa.gov/goto/midcolumbiacoho.

Eightmile Ranch Coho Acclimation Site [Okanogan County, Wash.]

BPA and the U.S. Forest Service plan to release the final environmental assessment for the Eightmile Ranch Coho Acclimation Site in December 2015 or January 2016. Additionally, the Forest Service plans to release its draft decision notice for the project at the same time. Release of these documents will begin a 45 day public objection period. Tentatively, the Forest Service plans to issue its final decision notice and special use permit, if warranted, in early 2016. BPA plans to release its finding of no significant impact, or FONSI, if warranted, within one to two weeks after the Forest Service issues the special use permit. For more information, go to www.bpa.gov/goto/Eightmile.

CLOSE OF COMMENT

- **Dec. 9**, Focus 2028
- **Dec. 10**, Cost verification process for fiscal year 2015 Slice true-up adjustment charge
- **Dec. 23**, Early Winters 3 Coho Acclimation Site
- **Jan. 4**, Melvin R. Sampson Hatchery, Yakima Basin Coho Project

CALENDAR OF EVENTS

For current meeting information, go to www.bpa.gov/PublicInvolvement/Cal.

FOR MORE INFORMATION

Information on other projects under environmental review is available at www.bpa.gov/goto/NEPA.

For information about the National Environmental Policy Act in general, go to www.bpa.gov/goto/environmentalplanning.

The Journal is a monthly publication of the Bonneville Power Administration. If you have questions or comments, or you want to be added to the mailing list for any project, call toll free 800-622-4519.

To order copies of documents, call: 800-622-4520 or 503-230-7334. Written comments may be sent to: BPA, P.O. Box 14428, Portland, OR 97293-4428. Email address: comment@bpa.gov. BPA home page: www.bpa.gov. For details on BPA environmental reviews listed above, including site maps and documents issued to date, see www.efw.bpa.gov/environmental_services/nepadocs.aspx. Process Abbreviations: EA-Environmental Assessment, EIS-Environmental Impact Statement, ESA-Endangered Species Act, FONSI-Finding of No Significant Impact, NOI-Notice of Intent, ROD-Record of Decision.

