

Washington Manufacturing Alert

The Newsletter
Of The State's
Most Important Industry

Vol. 9, Issue 19
Sept. 11, 2017

Newsire: Darigold plans to bring truck distribution in-house; state appeals dismissal of fines for refinery explosion; purchasing managers survey moves back to optimism; plus other news items. **Page 4**

Our Next Issue:
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Medical Device Sector's Challenge: We Need Workers

The most pressing issue for Washington's medical-device manufacturing sector is much the same as for the biotech side of the life-sciences industry, or for other manufacturing segments like aerospace: Where to find skilled workers.

Workforce development is a leading agenda item for the Washington Medical Device Summit, to be held Tuesday Sept. 12 at the campus of the University of Washington Bothell.

Matt Smith, director of industry and resource development for the Economic Alliance Snohomish County and board

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Canyon Hydro makes runners for turbines that turn water flows into electricity. Photos courtesy of the company.



Putting Water To (More) Work: McKinstry, Canyon Hydro, Covington Team Up

BY BILL VIRGIN
Editor/Publisher

Capturing the energy inherent in falling or moving water to do work or generate electricity was one of the original power sources of this country.

The Northwest still gets the bulk of its electricity from hydropower, mostly from mammoth dam projects, but engineers have long been intrigued with capturing the energy, otherwise lost, contained in water moving through pipes, industrial plants, water-treatment facilities, irrigation canals and other systems.

In the latest attempt to put that lost energy to work, Covington Water District (in King County) is teaming with McKinstry, the Seattle-based engineering firm, and Canyon Hydro, a manufacturer of hydroelectric turbine systems based in Deming (in Whatcom County) to install a turbine inside a water main to generate electricity for the district's administrative building.

The concept isn't new. A Seattle-area company, Hydrovolts, built some demonstration units for use in irrigation canals, but that company isn't in business. A Portland company, Lucid Energy, has developed an in-pipe turbine for use in large-diameter gravity-fed water supply lines, and has installed them in several systems. Another Oregon startup, InPipe Energy, is going after the same market.

In Covington's case a generating turbine will be installed in a 16-inch supply line connecting Tacoma Water's pipe, which carries water from the Green River near Howard Hanson Dam, to its own system. That's a drop of 170 feet, enough to build up considerable pressure.

Conventionally, the way to reduce pressure from transmission lines to what local distribution lines can handle is to use a valve, but the cost is energy lost as heat and noise. In Covington's case, a turbine will not only reduce the pressure but use it to generate electricity.

"It's well-established technology that's decades old," says Mark Nieman,

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Turning Moving Water Into Electricity: An Old Idea Getting A New Look

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McKinstry program manager and energy engineer.

But if that's so, why hasn't the technology been deployed more often?

The tricky part is not in generating the electricity but in where and how it's used. To simply stick a turbine in a supply line, generate power and sell it to the local utility at low wholesale rates wouldn't make economic sense. "One thing that kills the financial viability of these projects is the transmission cost," adds Tom Keown, general manager of Covington Water District.

Several factors helped in Covington's case. One is that it was going to be building the line anyway, so the turbine could be integrated into it. Covington also had a use for the electricity. The turbine will be able to supply as much as 75 percent of the building's power requirements, and since the flow is constant, it's not subject to huge swings in output as solar or wind would be. Better still, the turbine's output will be replacing electricity Covington buys from its supplier, Puget Sound Energy, at retail rates.

Also helping is a grant of \$79,447 from the state Department of Commerce, toward the total cost of \$376,000.

The supply line will operate at around 1,100 gallons a minute, with the turbine producing roughly 27 kilowatts. Construction is to start next fall and be completed in 2018.

For the turbine itself, McKinstry turned to Canyon Hydro, a company with extensive experience in building water-powered generating turbines.

Canyon Hydro, launched in 1976, operates a 24,000-square-foot fabrication facility in Deming and a 15,000-square-foot CNC machining center near Sumas; castings are done by three outside foundries. It also operates its own 30-kilowatt onsite hydro generating facility. The company has 50 employees. Annual sales average \$10 million to \$12 million. Richard New is president and co-owner; his father Daniel is vice president.

Those revenues are driven by energy recovery projects



A turbine and generator (on pedestal) similar to what's to be installed at Covington.

across the U.S. as well as in Canada, the United Kingdom and Chile. Some projects, such as a 5.5-megawatt installation on Vancouver Island, use run-of-river water diverted through a turbine before being returned to the stream. Others have been installed in municipal water systems; in another project, Canyon built a turbine to be used in an irrigation canal in Pasco.

"Currently we are involved in many similar projects, mostly in California where energy recovery, like that at Covington Water, has really taken off," says Eric Melander, vice president of sales. "We haven't run across many of these opportunities in Washington, but it is likely they are out there."

The Covington project isn't likely to be a one-off project, even for Covington. Keown said the system has been designed in such a way as to allow installation of a second turbine.

McKinstry, a design-build-operate-maintain firm for commercial buildings, sees the Covington hydro project as part of its broader mission to "push the envelope for new technologies for where it fits," Nieman says. "We're always looking at a wide array of conservation projects including water turbine technology, solar PV, wind, lighting upgrades in a building and HVAC upgrades. We're generalists in energy saving technologies. When it makes sense, where it makes sense, we'll definitely propose it again."

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