Sandia National Laboratories
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# Evaluating Hydrokinetic Turbine Operation within Roza Canal, Yakima, Washington

The DOE Water Power Program has recently identified the need to better understand the potential for hydrokinetic (HK) energy development within existing canal systems. HK turbine operation alters water surface elevations and modifies its flow in canals. Primary canal-water uses—for irrigation, in flood management, and/or for conventional hydropower plant—will not tolerate significant alterations or hydrodynamic energy losses. Sandia is collaborating with U.S. Bureau of Reclamation and Instream Energy Systems, who has been deploying a vertical-axis turbine at the site, to characterize the effect of HK turbine operation in the Roza Canal using field measurements and numerical modeling (SNL-EFDC and HEC-RAS).

*Instream Energy Systems turbine deployment at the Roza Canal site in Yakima, Washington.*

The adopted approach is to conduct field measurements and then use them to derive important modeling parameters, such as velocity, water level, discharge, and turbine thrust for a single turbine. Then, propagate these parameters to model the impact of arrays of HK turbines in the canal. Three field measurement campaigns are planned for spring and summer 2014, to provide better insight on the HK turbine operation for different flow conditions.

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