



Water resource engineer Rich Jepsen (left), hydrologist Jesse Roberts (right), and Manager Jose Zayas (center). (Photo by Randy Montoya)

## Sandia Adds Water Power to Clean Energy Research Portfolio

ALBUQUERQUE, N.M. – Sandia National Laboratories will receive more than \$9 million over three years from a Department of Energy competitive laboratory solicitation for the development of advanced water power technologies.

Sandia, through a partnership with several national laboratories and academic institutions, will lead two of the four topic areas awarded under the grant and will provide technical support in a third topic area. The topic areas are Supporting Research and Testing for Marine and Hydrokinetic Energy, Environmental Assessment and Mitigation Methods for Marine and Hydrokinetics Energy, Supporting Research and Testing for Hydropower, and Environmental Assessment and Mitigation Methods for Hydropower.

"We will perform fundamental research to develop and assess technology breakthroughs and help promote a vibrant industry that is currently in its beginnings," said Jose Zayas, manager of Sandia's Wind and Water Power Technologies group.

"Water power technologies contribute to the diversification of our nation's energy mix," Zayas said, "by providing clean energy in areas near high population centers as well as enhancing our nation's energy security. Water power technologies could leverage an indigenous resource in parts of the country where other technologies may not be viable."

Zayas will add the water power research to the department's wind energy portfolio. He will oversee a multidisciplinary team drawn from many areas of lab expertise, including materials and manufacturing research, environmental monitoring and stewardship, performance modeling, and testing. The department will pursue a diverse research agenda in marine hydrokinetics (MHK) systems and will collaborate with Argonne and Oak Ridge national laboratories on conventional hydropower.

### Technology evaluation

Rich Jepsen, a specialist in water resources engineering, will lead the project to examine the cost-effectiveness and reliability of technology for MHK technologies, which include wave, current/tide and thermal energy conversion. Jepsen's water power research will also evaluate the use of Sandia's lake facility, used for large-scale wave testing.

In partnership with Oak Ridge National Laboratory (ORNL), Pacific Northwest National Laboratory (PNNL) and the National Renewable Energy Laboratory (NREL), activities will evaluate new device designs and conduct basic research in materials, coatings, adhesives,

hydrodynamics, and manufacturing to assist industry in bringing efficient technologies to market.

The research will focus on developing and advancing the science and tools needed to bring new water power technologies to market and evaluating methods designed to improve the performance of existing hydropower facilities.

Sandia will also work with NREL, the other lead in the technology area, in the direct design and testing of new technologies.

### **Environmental stewardship**

Jesse Roberts, a specialist in sediment transport and hydrology, will lead Sandia's research to describe and quantify environmental impacts caused by new and existing marine and hydrokinetic technologies. The team will evaluate environmental factors including rates of sediment transport, water flow, water quality and acoustic changes. The results will help quantify the types and magnitude of environmental impacts for various new and existing technologies. Researchers will collaborate with industry to develop criteria for selecting locations for projects and select technology to monitor and mitigate such impacts. Sandia will partner with ORNL, PNNL and ANL in this work.

In both areas, Zayas said, Sandia will work with universities to leverage its existing world-class facilities for research to provide students and faculty the opportunity to work on water power problems and technologies.

"Sandia will work to bridge the gap between research institutions and industry by helping to develop technologies that deliver cost-effective and reliable energy while also committing to the importance of environmental stewardship," he said.

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Sandia National Laboratories is a multiprogram laboratory operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin, for the U.S. Department of Energy's National Nuclear Security Administration. With main facilities in Albuquerque, N.M., and Livermore, Calif., Sandia has major R&D responsibilities in national security, energy and environmental technologies, and economic competitiveness.