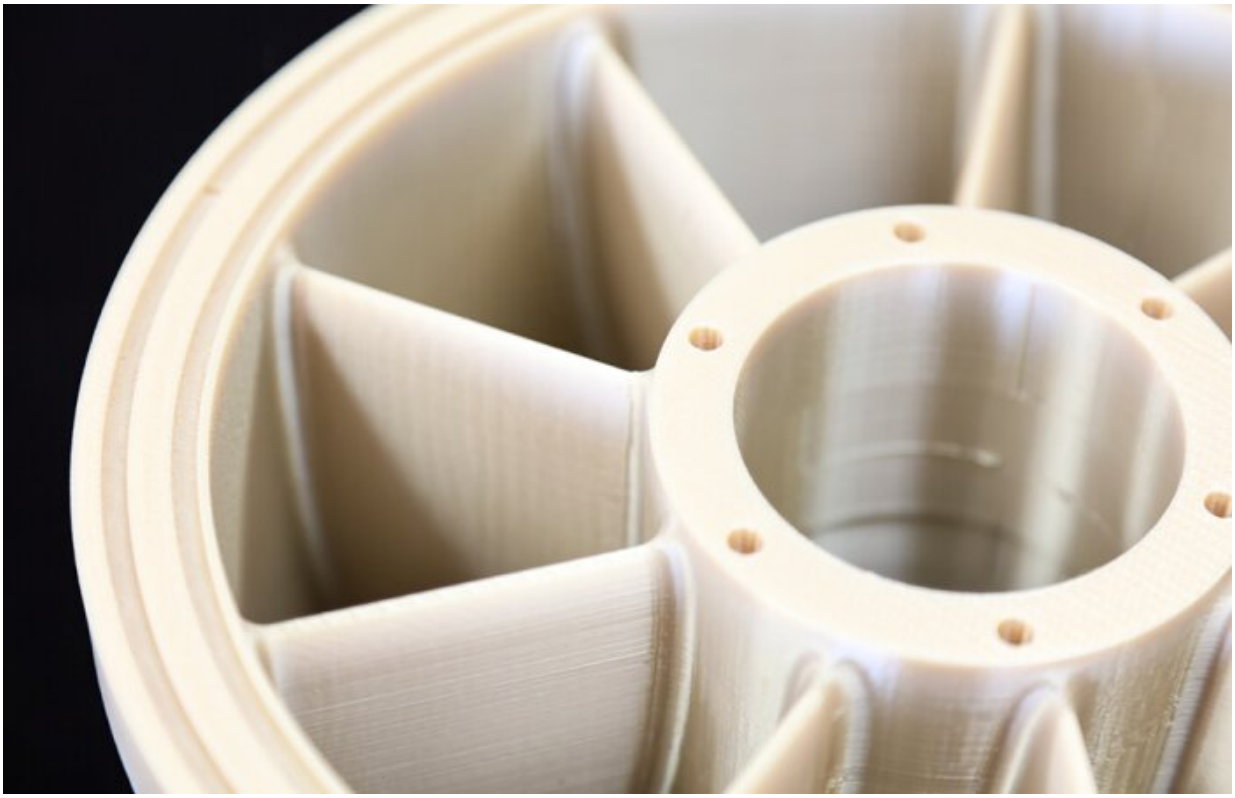
Advanced manufacturing and materials to modernize the existing hydropower fleet and design new approaches

March 27 2023, by Mimi McHale



This newly manufactured fixed guide vane of a hydropower turbine system was additively created at the DOE Manufacturing Demonstration Facility at ORNL. Credit: Genevieve Martin/ORNL, U.S Dept. of Energy

Over 100 years ago, the hydropower industry, which today generates

32% of all U.S. renewable energy, was built using traditional manufacturing processes. Surging energy demand, higher material costs, and supply chain hurdles have led researchers to rethink manufacturing.

A new report published by Oak Ridge National Laboratory assessed how advanced manufacturing and materials, such as 3D printing and novel component coatings, could offer solutions to modernize the existing fleet and design new approaches to hydropower.

For the assessment, ORNL brought together representatives from the hydropower industry advanced manufacturing industries, research institutions, and groups committed to environmental stewardship.

Their collaboration identified existing infrastructure challenges and how advanced manufacturing could enhance new design capabilities, improve system and component performance, reduce reliance on foreign manufacturing and better address environmental concerns.

"Hydropower has enormous potential in securing a cleaner, more sustainable energy future," said ORNL's Mirko Musa. "We can build upon its success, layer by layer."

More information: Report: info.ornl.gov/sites/publicatio … /Files/Pub190558.pdf

Provided by Oak Ridge National Laboratory