

Transforming the Northwest Energy System NWESS 2026



University of Washington
Alder Hall
April 1-2, 2026



Speaker(s): Aisha McKee & Jon Bender

Title: Large Power Transformer Seismic Response

Abstract: High voltage power transformers play a critical role in grid reliability, yet remain susceptible to seismic failures after a major earthquake, requiring time-consuming repairs or total replacement. This presentation examines current efforts to improve seismic transformer resilience through design, analysis, and testing. Special attention is given to bushing failures (the most common failure) as well as emerging mitigation strategies such as base isolation. The upcoming government-funded shake table test of a full-scale 3-phase 230kV transformer and its potential contributions to broader grid resilience will also be discussed.

Bio: Aisha McKee is a research engineer with a multidisciplinary background. She currently works at WEGAI Research where she focuses on protection of high-voltage substation equipment from natural hazards. She supports a multi-year DOE project focused on improving transformer resilience through dynamic testing and practical damping/isolation mitigation strategies. Previously, she led R&D efforts at Glostent and worked on wave energy systems at C-Power. She holds a B.S. and M.S. in Mechanical Engineering. Aisha is passionate about finding solutions to real-world problems that matter and she brings a systems-thinking approach to energy and infrastructure resilience.

Jon Bender is the principal at WEGAI Research and a senior consulting engineer with W.E. Gundy & Associates, focused on improving multi-hazard infrastructure resilience. He applies his expertise in seismic qualification of substation equipment to develop tools that address grid vulnerabilities, including identifying structural concerns and aligning industry practices with actual risk. His work spans coordination with technical committees and manufacturers, performing simulations and tests, and creating both innovative and repurposed solutions. Jon holds a civil PE license in multiple states, an M.S. in Civil Engineering from Boise State University, and an M.E. in physics education from the University of Alaska.

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