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Dr. Colby Jensen is the separate effects testing lead for Transient Reactor Test (TREAT) experiments in the Fuel Performance and Design Department at Idaho National Laboratory. His research expertise is in thermal transport in materials, instrumentation and measurements, thermodynamics and heat transfer, and transient nuclear fuel performance for oxide and metallic fuels in light water reactor and sodium-cooled fast reactor systems. In his present position, Dr. Jensen is a principal investigator for transient testing of nuclear fuels, leads in-pile instrumentation development for transient irradiation testing and development of in-pile thermal properties measurement capabilities, and leading capabilities strategy for post-Halden reactor testing. He is also an experiment safety and fuel performance analyst for experiments at TREAT and the Advanced Test Reactor.

Dr. Jensen received his joint-doctorate degree in Mechanical engineering from Utah State University and in Energy Engineering from the Universite de Reims Champagne-Ardenne in 2014. He has more than 45 peer-reviewed publications and is a Secretary/Treasurer for the Material Science and Technology Division of the American Nuclear Society.

Transient Testing Nuclear Fuels and Materials for Advanced Technology Development

Historically, in-pile transient irradiation facilities have provided foundational data and understanding supporting nuclear fuel development, nuclear reactor development, and validation of modeling and simulation tools, crucial for today’s industry. The recent restart of the Transient Reactor Test (TREAT) facility at Idaho National Laboratory represents a return of transient testing capability in the U.S. after more than 20 years without.

This presentation will provide an overview of transient testing in the context of nuclear fuel safety research and highlight current developments in experimental capabilities and R&D strategies to address modern technology needs. Examples of current experimental approaches and early results will be presented. Some emphasis will be placed on development of novel sensors and instrumentation to achieve modern data needs.