Autoclave Recirculating Loop Procurement and Installation to Enable LWR Immersion, Slow Strain Rate, and Constant Extension Rate Testing

PI: James Stubbis, University of Illinois, Urbana-Champaign
Collaborators: Brent Heuser, NPRE UIUC
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ABSTRACT:

The procurement and installation of an autoclave recirculating loop testing station with constant rate extension and slow strain rate testing capability is proposed at the University of Illinois. This equipment will facilitate significant improvement of undergraduate and graduate student laboratory experiences within the NPRE curriculum. It will also enable faculty-directed graduate student research advancing the goals of the Office of Nuclear Energy within the U.S. DOE. The primary objective of the proposed project is the use of the proposed autoclave recirculating loop testing station to perform LWR immersion experiments with and without applied load for research and teaching. The equipment will enable UIUC faculty and students to perform experiments related to stress corrosion cracking, cyclical fatigue, and creep of LWR advanced alloy structural components. No such facility currently exists at the University of
Illinois. The impact of the proposed equipment procurement is anticipated to be significant. The autoclave testing station will be placed within new space designated for undergraduate laboratory instruction. This new space represents a $5.4M investment by the University of Illinois College of Engineering, the Provost's Office, and the NPRE Department. The proposed equipment will become the centerpiece within the new NPRE Materials Laboratory.