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Passive Safety Testing at the Fast Flux Test Facility Relevant to New LMR Designs

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Significant cost and safety improvements can be realized in advanced liquid metal reactor designs by emphasizing inherent or passive safety through crediting the beneficial reactivity feedbacks associated with core and structural movement. This passive safety approach was adopted for the Fast Flux Test Facility (FFTF), and an experimental program was conducted to characterize the structural reactivity feedback. The FFTF passive safety testing program was developed to examine how specific design elements influenced dynamic reactivity feedback in response to a reactivity input and to demonstrate the scalability of reactivity feedback results to reactors of current interest. Benchmarks based on empirical data gathered during operation of the FFTF as well as design documents and post-irradiation examination will aid in the validation of software packages and the models and calculations they produce. Evaluation of these actual test data could provide insight to improve analytical methods which may be used to support future licensing applications for LMRs.

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