

Scoping Analysis of Fuel Vapor Expansion Work Energy in KALIMER

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Abstract

An effort was made in this study to evaluate work energy arising from fuel vapor expansion during core disruptive accidents in KALIMER. A bounding approach was adopted to calculate the work potential assuming isentropic fuel vapor expansion to atmospheric pressure during super-prompt critical power excursions. Scoping calculations with a modified Bethe-Tait method were carried out to have available the initial thermodynamic conditions for this analysis, such as core temperature and pressure. It was shown that resulting value of the work potential for the design basis case of power excursion was less than the structural design criteria for the reactor system of KALIMER.