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Research Article

Comparative Evaluation of Coolant Mixing Experiments at the ROCOM, Vattenfall, and Gidropress Test Facilities

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Abstract

Coolant mixing is an important mitigative mechanism against reactivity-initiated accidents. Experiments on coolant mixing were carried out at three different test facilities. These are the ROCOM test facility modelling a German KONVOY model of a Westinghouse three-loop PWR, and the Gidropress test facility. The start-up of the first main coolant pump was investigated at both facilities accompanied by velocity measurements in the downcomer for the start-up phase. A similar flow structure was found in these measurements. The maximum velocity measured at the opposite side in regard to the position of the local inlet nozzle area was found just below this inlet nozzle in both facilities. The flow behaviour is comparable. In accordance with the velocity measurements, the maximum deformation values found on the opposite side. In this region, the maximum deformation values are in the same order of magnitude for nearly identical initial conditions.