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DEVELOPMENT OF THE BEST-ESTIMATE SYSTEM TRANSIENT ANALYSIS CODE, SSC-K, FOR POOL-TYPE LIQUID METAL REACTORS

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Abstract

The SSC-K code is a best-estimate system analysis code for the analyses of steady-state conditions and transients in pool type liquid metal reactors. It is developed on the basis of the SSC-L originally developed at BNL to analyze loop-type liquid metal reactor transients. Because of operational characteristic difference between the pool and loop designs, the major modifications of SSC-L have been made for the safety analysis of KALIMER. The code uses a one-dimensional representation of single-phase flow that solves conservation equations for mass, energy, and momentum for liquid phase. The paper will focus on the modeling descriptions and logical verification results to illustrate the simulation capabilities for pool-type liquid metal reactor transients. The paper also describes some of capabilities on a post-processor developed to effectively analyze SSC-K simulation results.

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An Application of RELAP5/MOD3 to the Post-LOCA Long Term Cooling Performance Evaluation

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Abstract

A realistic long-term calculation to be used in the post-LOCA long term cooling (LTC) analysis is described in this study, which was required to resolve the post-LOCA LTC issues including the concern on boric acid precipitation in the reactor core. The analysis scope is defined according to the LTC plan of UCN Units 3/4 and the plant calculation model are developed suitable to the LTC procedure. The LTC sequences following the cold leg small break LOCAs of 0.02 ft2 to 0.5 ft2 are calculated by RELAP5/ MOD3.2.2. Based on the calculation results, the establishment of shutdown cooling system entry condition and the behavior of boron transport are evaluated. The effect of model simplification is also investigated.