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The Analysis of TRACE/FRAPTRAN in the Fuel Rods of Maanshan PWR for LBLOCA

Authors : J. R. Wang, W. Y. Li, H. T. Lin, J. H. Yang, C. Shih, S. W. Chen

Abstract : Fuel rod analysis program transient (FRAPTRAN) code was used to study the fuel rod performance during a postulated large break loss of coolant accident (LBLOCA) in Maanshan nuclear power plant (NPP). Previous transient results from thermal hydraulic code, TRACE, with the same LBLOCA scenario, were used as input boundary conditions for FRAPTRAN. The simulation results showed that the peak cladding temperatures and the fuel center line temperatures were all below the 10CFR50.46 LOCA criteria. In addition, the maximum hoop stress was 18 MPa and the oxide thickness was 0.003 mm for the present simulation cases, which are all within the safety operation ranges. The present study confirms that this analysis method, the FRAPTRAN code combined with TRACE, is an appropriate approach to predict the fuel integrity under LBLOCA with operational ECCS.

Keywords : FRAPTRAN, TRACE, LOCA, PWR
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