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Simulation of Heat Exchanger Behavior during LOCA Accident in THTL Test Loop

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Abstract : In nuclear power plants, loss of coolant from the primary system is the type of reduced removed capacity that is given most attention; such an accident is referred as Loss of Coolant Accident (LOCA). In the current study, investigation of shell and tube THTL heat exchanger behavior during LOCA is implemented by ANSYS CFX simulation software in both steady state and transient mode of turbulent fluid flow according to experimental conditions. Numerical results obtained from ANSYS CFX simulation show good agreement with experimental data of THTL heat exchanger. The results illustrate that in large break LOCA as short term accident, heat exchanger could not fast response to temperature variables but in the long term, the temperature of shell side of heat exchanger will be increase.

Keywords : shell-and-tube heat exchanger, shell-side, CFD, flow and heat transfer, LOCA
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