

Transient Analysis of Letdown System with Letdown Orifices

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Abstract

The CARD(CVCS Analysis for Design) code has been developed for the transient analysis of the letdown and charging system of a nuclear power plant. The code has been verified by comparing the simulated data with the measured data from the performance test of the letdown system with letdown control valves. The simulated data showed good consistency with the plant measured data. Analyzed are the flow and pressure transients in the letdown line with letdown orifices. The sensitivity studies are performed to evaluate the backpressure response and system instability for various valve stroking times, controller control setpoints and valve characteristics. The results show that the backpressure controller control setpoints and letdown orifice isolation valve stroking times have a significant effect on the letdown system stability. It is also found that the worst transient occurs during the minimum flow to normal flow changeover. The results obtained from this study will be used to verify the system design and to select the optimum control parameters for the letdown system having letdown orifices.