
PROBLEM 11-12N QUESTION

Critical Flow During a Small-Break LOCA in a BWR

A small break (10 cm^2) occurs at a certain location on the coolant recirculation line of a BWR. Calculate the mass flow rate at which the coolant is discharged through the break into the containment. Use the following three models:

- 1) Non-equilibrium model for an orifice ($L/D \sim 0$).
- 2) Non-equilibrium model for a short discharge nozzle ($L/D \sim 2$).
- 3) Equilibrium model with Fauske's assumption for the slip ratio.

Assumptions: □

- □ The coolant inside the primary system can be modeled as saturated liquid water at 6.9 MPa (1,000 psi).
- □ Assume that the containment pressure remains constant at 0.1 MPa.