
PROBLEM 7-10N QUESTION

Containment Problem Involving a LOCA

Upon a loss of primary coolant accident (LOCA) the primary system flashes as it discharges into the containment. At the resulting final equilibrium condition, the containment and primary system are filled with a mixture of steam and liquid. A containment is being designed as shown in Figure 1 which directs the liquid portion of this mixture to flood into a reactor cavity in which primary system is located. The condensate which passes back into the core through the break can satisfactorily cool the core if it can submerge it, i.e., if the condensate level is high enough.

Find the containment volume which will yield a final equilibrium pressure following primary system rupture sufficient to create the 125 m^3 of liquid required to fill the cavity and submerge the core.

The pressure and volume of the primary system are 15.5 MPa and 354 m^3 , respectively.

- Neglect the initial relative humidity and the air in the containment.
- Neglect \dot{Q}_{c-st} and \dot{Q}_{c-atm} .

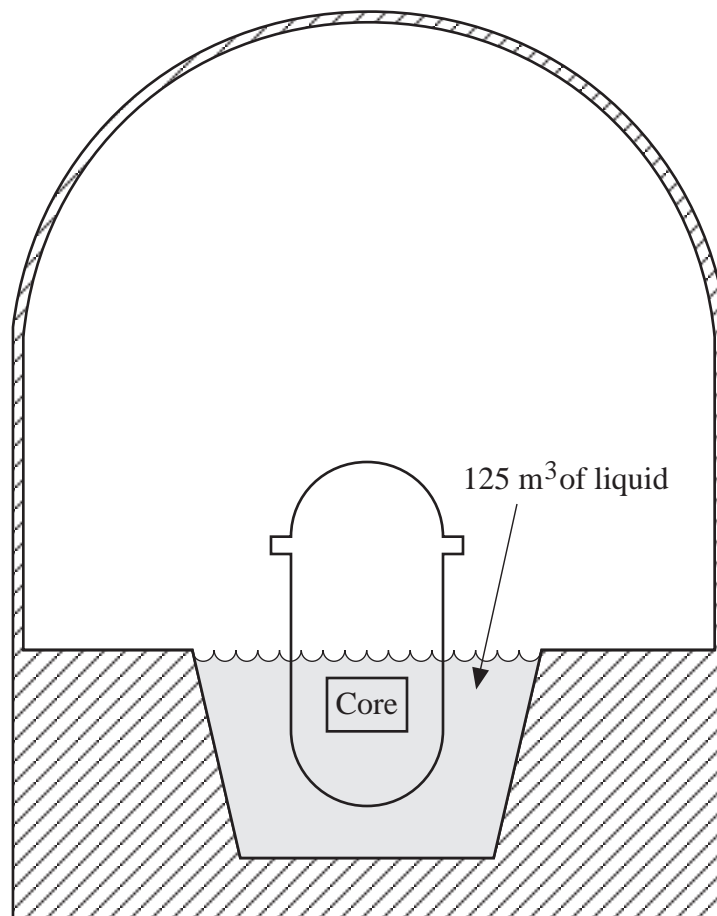


Figure 1