Abstract

Radiation is responsible for heat transfer from fuel rods to the Pressure tube during loss of coolant. The temperature distribution of the pressure tube is obtained through experimental test runs. A Finite Difference Method and ANSYS are applied to predict the axial temperature distribution and its effect on a pressure tube by incorporating the radiative and convective boundary conditions. The results obtained using FDM and ANSYS are compared well with the experimental results. Prediction of the temperature distribution of a cylindrical pressure tube, heated by conjugate conduction and radiation from inside of it that is cooled by natural convection and radiation from outside, are reported in this paper. Pressure tube is subjected to the higher temperature at top and lower temperature at bottom. These two extreme temperatures are input to the FDM and ANSYS software. The comparison is made with the experimental results and agreement between the mathematical model (FDM) and the ANSYS results is very good.

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Index Terms

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