

Identification of limiting case between DBA and SBDBA (CL break area sensitivity): A new model for the boron injection system

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[en] Atucha-2 is a Siemens-designed PHWR reactor under construction in the Republic of Argentina. Its geometrical complexity and (e.g., oblique Control Rods, Positive Void coefficient) required a developed and validated complex three dimensional (3D) neutron kinetics (NK) coupled thermal hydraulic (TH) model. Reactor shut-down is obtained by oblique CRs and, during accidental conditions, by an emergency shut-down system (JDJ) injecting a highly concentrated boron solution (boron clouds) in the moderator tank, the boron clouds reconstruction is obtained using a CFD (CFX) code calculation. A complete LBLOCA calculation implies the application of the RELAP5-3D^C system code. Within the framework of the third Agreement 'NA-SA - Univ. of Pisa' a new RELAP5-3D control system for the boron injection system was developed and implemented in the validated coupled RELAP5-3D/NESTLE model of the Atucha 2 NPP. The aim of this activity is to find out the limiting case (maximum break area size) for the Peak Cladding Temperature for LOCAs under fixed boundary conditions. (authors)

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