

CALCULATION OF THE BORIC ACID DISTRIBUTION IN THE ATUCHA 1 MODERATOR TANK USING CFX CODE

Luis Lencina, Hugo Ballesteros, Miguel Schivo and Oscar Mazzantini

Nucleoeléctrica Argentina S.A., Argentina, luis.lencina@gmail.com, hballesteros@na-sa.com.ar, mschivo@na-sa.com.ar, mazzantini@na-sa.com.ar

Abstract. The nuclear power plant Atucha I is a pressurized heavy water reactor, that possesses two independent shutdown systems to stop the nuclear fission chain reaction: control rods fall down and the fast injection of boric acid in the moderator tank.

This second shutdown system (TJ) has three independent hydraulic systems that inject the boric acid solution in heavy water into the moderator tank driven by a high pressure air tank.

During the licensing of the plant, a series of experiments were performed to determine negative reactivity inserted during the short transients. An experimental facility was built to determine the boric acid distribution in the moderator tank. Photographs were taking to establish the front advance of the acid concentration.

The objective of this work is to determine the three-dimensional distribution of the boric acid solution as a time function for different scenarios of interest using the comercial numerical tool Ansys CFX.

The method used to generate the domain discretization, calculation hypotesis, numerical models and results will be shown.

These results will be used later to calculate the negative reactivity insertion using neutronic codes.