HEAT TRANSFER MODE IN THE CORE OF THE ANGRA 2 NUCLEAR POWER PLANT DURING SMALL BREAK LOCA OBTAINED WITH RELAP5 CODE

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This work aims to identify the heat transfer mode with RELAP5/MOD3.2.gama code in the core of Angra 2 facility. The postulate accident is the Loss of Coolant Accident (LOCA) in the primary circuit for Small Break (SB), which is described in Chapter 15 of the Final Safety Analysis Report of Angra 2 (FSAR). The accident consists basically of the total break of the cold leg of Angra 2 facility. The rupture area considered was 380 cm2, which represents 100% of the primary circuit pipe flow area. The Emergency Core Cooling System (ECCS) efficiency is also tested in this accident. In this simulation, failure and repair criteria are adopted for the ECCS components in order to verify the system operation efficiency - preserving the integrity of the reactor core and guaranteeing its cooling - as expected by the project design. SBLOCA accidents are characterized by a fast blowdown in the primary circuit to values that activate the low pressure injection system followed by the water injection from the accumulators. The thermal-hydraulic processes inherent to the accident phenomenon, such as hot leg vaporization and consequently core vaporization cause inappropriate flow distribution in the reactor core that can lead to reduction in the core liquid level, up to the point that the ECCS is able to reflood it. This work shows the mode numbers and the wall convection heat transfer used in the RELAP5 code that were accessed during the execution of the program. The results showed that the numerical simulations with RELAP5 were satisfactory and that the ECCS worked efficiently, guaranteeing the integrity of the reactor core.