**Post-test analysis of PARAMETER SF- 4 using SCDAP/RELAP5**

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**Abstract**

The PARAMETER program is being performed by LUCH under the oversight of the International Science and Technology Centre in Rusia. This program studies the behaviour of an electrically heated bundle under Beyond Design Basis Accident (BDA). The materials and configuration were prototypical of a VVER (i. e. Zr-1%Nb, E-110 cladding, hexagonal rod geometry and unirradiated UO2 for the pellet simulation). This attributes make the PARAMETER test data unique. Up to date, three experiments have been performed in the PARAMETER series (i. e. SF-1 top injection, SF-2 top and bottom injection and SF-3 top injection). PARAMETER SF-4 is the first in the series to include an air ingress phase followed by recovery by bottom injection. Thus SF4 was an approximate counterpart to QUENCH-12, but with VVER materials and configuration.

A limited set of post- test calculations of the PARAMETER SF-4 were performed using local versions of SCDAP/RELAP5 to investigate the applicability of the code for an air ingress scenario, and to provide a baseline simulation to provide comparison with the measured data and a starting point for later, in-depth analysis. The Cathcart Pawel – Urbanic Heidrick (CP-UH) and Sokolov oxidation models were compared with the experimental results. The principal aim of this analisys was to study the temperature behaviour during air ingress, the oxygen starvation front, and the reflood quench behaviour.

The pre-oxidation transient was in fair agreement with the experiment. Some discrepansies between post-test calculation and data during the air and the reflood phase were observed. This discrepansies could be explained by the limitation of the code to adequately represent the air ingress. Improvements in the code are currently taking place in order to solve this issue.