

Chromium Doped Fuel Calculation by FEMAXI-6

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Abstract. The current research aimed to the nuclear fuel reflects the transformation of the power generation industry and consequences of the Fukushima accident. Accident tolerant fuel should handle load follow operation longer time irradiation time and in parallel withstand Design Basis Conditions. To reasonable predict and validate designed fuel performance it is necessary to benchmark the computational tools against high quality experimental data. Therefore, this paper demonstrates computational capabilities of the FEMAXI-6 code to predict thermomechanical parameters of ATF type fuel. Two rods with Chromium doped fuel with large grain size were of interest within Halden High Initial Rating experiment, where the fuel was exhibited to high power rate at the level of 400 W/cm directly from the beginning of experiment. The calculations of FEMAXI-6 code were carried out with its standard capabilities and available models and sensitivity analyses was performed to identify the most representing definitions. Prediction of the fuel center temperature was in good agreement with measurements, where the main discrepancies were obtained in the first period of the irradiation. FGR as well as rod pressure were underpredicted in both rods and the code limitations were identified.