_X.png _X.bb _X.png height

Contribution ID: **79**   Type: **Talk**

Validation of the OSCAR-5 Code System against Experimental Data on Fuel Burnup and Material Activation in Research Reactors

Wednesday, 6 December 2017 11:30 (20 minutes)

The IAEA (International Atomic Energy Agency) Cooperative Research Project (CRP) 2026, entitled "Benchmarks of Computational Tools against Experimental Data on Fuel Burnup and Material Activation for Utilization, Operation and Safety Analysis of Research Reactors", provides a valuable opportunity to validate calculations tools against quality experimental data. As part of this multi-national effort, Necsa (South African Nuclear Energy Corporation) contributed operational and experimental data of the SAFARI-1 research reactor, and also performed simulations for four other reactors from around the world, using both in-house developed and external codes. The OSCAR-5 systems is the latest iteration of the in-house developed code system which currently supports the operation of the SAFARI-1 reactor, and a number of other research reactors around the world. This version for the first time incorporates support for high fidelity modeling, and therefore has a strong HPC component.

This talk will give an overview of the calculational system, in particular how and where computational resources are used, and summarize some initial validation results for the five reactors modeled.

HPC content

The Monte Carlo transport code Serpent was the primary HPC code used in this study. It was compiled with both OMP and MPI options, using the GNU and Intel tool chains. However, since runs using multiple nodes did not pass all verification checks, the code was typically deployed on only one node using 24 cores. This suited the nature of the study, which had many similar medium sized jobs, as apposed to a few very large ones.

Primary author: Dr VAN HEERDEN, Francois (Necsa)

Presenter: Dr VAN HEERDEN, Francois (Necsa)

Session Classification: Material Science

Track Classification: Materials Science & Physics