PAUL SCHERRER INSTITUT

PSI

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Proposed activities

First *ad-hoc* virtual meeting, SNF-DH, September 29th, 2021

Zertifiziertes Managementsystem
STARS
ISO 9001

Summary

- Overview
- Activity 1: Literature survey + discussion on new calorimeter
- Activity 2: Calculated DH for a specific SNF case
- Activity 3: New blind benchmark

Voting results:

- A. 15/2 votes, Act.1, followed by 2 (2years + 2years)
- B. 19/9 votes, Act.1, followed by 3 (2years + 2years)
- C. 14/16 votes, Act.1, 2 + new International Calorimeter (2 years) ; Act 3 + new International Calorimeter (2 years)
- D. 10/2 votes, Act. 1, 2 and 3 (2 years + 2 years + 2 years)
- E. 9/0 votes, Split in groups

Overview

- Goal: select activity/activities for 2 years (starting January 2022)
- If a selected activity is expected to extend beyond 2 years, need for a 2 year definition, followed by another 2 years
- 3 activities proposed in the following

Activity 1

Study of the available experimental data

- List public/private decay heat measurements (and related quantities)

- Perform a literature survey on the use of such measurements
- Classify the public ones (*e.g.* quantities, fission pulse, calorimeter, fuel type and characteristics)
- Assess their quality and usefulness for the long-term goal (expert judgment)
- Propose a list of selected data (original or modified), possibly to be used for comparison to calculated values

- Finally, establish a report or extended paper on the “state-of-the-art” concerning experimental decay heat quantities. This can help to pinpoint the areas of data needs, in support of existing or future installations.

Activity 2

Select a specific SNF case of interest and perform DH calculations

- Defining an assembly case (*e.g.* UO2, 4.5% enriched, with provided design and irradiation history), or a simple 2D pincell, as well as the quantities of interest
- Each participant performs decay heat calculations and related quantities (fission rates, neutron/gamma emissions, isotopic compositions) with its own calculation scheme
- Comparison and analysis of the results
- Comparison with decay heat standards
- (computational blind benchmark, without measurements)
- Report/publication

Activity 3

Blind benchmark

- Based on the 2014 CLAB measurements, called SKB-50 (25 PWR and 25 BWR assemblies)
- Perform blind calculations, based on provided design/irradiation
- Compare calculated and measured decay heat values, gamma/neutron values
- Similar to the recent “blind DH benchmark” with 5 assemblies
- Depend on data availability from SKB (export control procedures for each participant, about 6 months duration, or more)
- Report/publication

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Wir schaffen Wissen – heute für morgen