WIR SCHAFFEN WISSEN – HEUTE FÜR MORGEN

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Preliminary information for the new subgroup on Spent Nuclear Fuel decay heat

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

- Background

- Subgroup general goal

- Context & activities

- Participants

- Spent Nuclear Fuel decay heat (SNF-DH) is a key quantity for SNF characterization:
  - Wet storage
  - Transport casks
  - Reprocessing facilities
  - Storage canisters
  - (Severe accident)

- Linked to criticality, dose, nuclide inventory

- No systematic SNF-DH measurements planned worldwide: reliance on calculated DH

⟶ **Calculated DH estimation and confidence intervals are a necessity**

- High interest from different actors of the nuclear industry

Background

- The SNF-DH depends on many factors
  - Irradiation history
  - Assemblies types, enrichments, burnup
  - Cooling time
  - Nuclear data
  - Modeling assumptions

- Recent "Blind decay heat benchmark" from SKB tends to indicate different C/Es than expected

- What are the associated uncertainties, biases ?

- How applicable are the DIN, ISO, NRC standards to recent SNF (high burnup, MOX ?)

- Can we provide *evaluated* DH for specific cases ?

Subgroup general goal

- Goal: Provide users with reliable estimations of SNF-DH

- Underlying:
  - guidance, specific studies, estimates, validity regions
  - Analysis of experiments/calculations

- Framework:
  - Spent fuel from existing power plants
  - Decay heat for specific cooling periods (to be determined (*e.g.* < 3days, >months, years, decades, more)
  - To be planned within 2-year activities to fit the WPNCS requirements

- Link to Working Party activities: WPNCS, WPRS and WPEC

- <u>Context</u>: see Julie's presentation

- <u>Goal of the meeting:</u>
  - Define activities for the next 2 years

Participants

- Expressions of interest from 12 member countries, IAEA and EU (in alphabetical order), 24/09/2021:

P. Àlvarez, D. Cano (CIEMAT, Spain)	S. Häkkinen, P. Juutilainen, J. Leppanen (VTT, Finland)	Y. Nauchi, S. Sato (CRIEPI, Japan)
A. Bardeley, R. Ichou (IRSN, France)	R. Hall (EPRI, USA)	P. Petkov (Sofia Univ., Bulgaria)
O. Cabellos (UPM, Spain)	V. Hannstein, F. Sommer (GRS, Germany)	D. Rochman (PSI, Switzerland)
L. Capponi, R. Mills (NNL, UK)	G. Ilas, W. Wieselquist (ORNL, USA)	P. Schillebeeckx, S. Kopecky (EU JRC Geel)
C. Carmouze, V. Vallet (CEA, France)	P. Jansson (UU, Sweden)	M. Seidl (PreussenElectra, Germany)
S. Caruso (KKG, Switzerland)	A. Koning, L. MacManniman (IAEA)	T. Simeonov (Studsvik, USA)
R. Dagan (KIT, Germany)	M. Kromar (IJS, Slovenia)	A. Sjöland (SKB, Sweden)
L. Fiorito (SCK-CEN, Belgium)	J. Lam (Rolls-Royce, UK)	S. Tittelbach (WTI, Germany)
F. Gomez (ENRESA, Spain)	A. Launay, V. Leger (ORANO, France)	
K. Govers (FANC, Belgium)	F. Minato, T. Watanabe (JAEA, Japan)	