

PAUL SCHERRER INSTITUT



eurad

European Joint Programme
on Radioactive Waste Management



D. Rochman

EURAD WP8/Subtask 2.1: Status



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EURAD WP8 task 2 meeting, 10-12 May 2023, Karlsruhe, Germany



Status: All done ! Thank you very much

- Papers/report

RESEARCH REPORT
Sensitivity and uncertainty analysis of Gundremmingen-A assembly B23 sample I2680 depletion calculation with Serpent 2
Authors: Sijja Häkkinen
Confidentiality: Public

RESEARCH REPORT
Gundremmingen-A assembly B23 sample I2680 depletion calculation with Serpent 2
Authors: Sijja Häkkinen
Confidentiality: Public

NENE 2019
28th International Conference Nuclear Energy for New Europe
Determination of the NPP Krško spent fuel characteristics with the Serpent and SCALE code systems
Marjan Kromar
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Nuclear Engineering and Technology
Contents lists available at ScienceDirect
journal homepage: www.elsevier.com/locate/engtec
Original Article
Uncertainty analyses of spent nuclear fuel decay heat calculations using SCALE modules
Ahmed Shama^{a,b,*}, Dimitri Rochman^b, Susanne Pudollek^c, Stefano Caruso^d, Andreas Pautz^{a,b}

frontiers | Frontiers in Energy Research
Original Research
Analyses of the bias and uncertainty of SNF decay heat calculations using Polaris and ORIGEN

Validation of spent nuclear fuel decay heat calculations using Polaris, ORIGEN and CASMO5

EPJ Nuclear Sci. Technol. 8, 9 (2022)
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https://doi.org/10.1051/epjn/2022007

Validation of spent nuclear fuel decay heat calculations using Polaris, ORIGEN and CASMO5
Dimitri Rochman^c, Stefano Caruso^{d,b}, Andreas Pautz^{a,c}
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https://doi.org/10.1051/epjn/2021027

Uncertainty analyses of spent nuclear fuel decay heat calculations using SCALE modules
Ahmed Shama^{a,b,*}, Dimitri Rochman^b, Susanne Pudollek^c, Stefano Caruso^d, Andreas Pautz^{a,b}

Spent fuel characterization analysis using various nuclear data libraries
Dušan Čalič^a, Marjan Kromar^b
Jožef Stefan Institute (JSI), Slovenia

Comparing Different Approaches to Calculating Decay Heat Power of a Spent Fuel Dry Storage Cask for Krško NPP
M3 sam
Zeljko Husin

On the estimation of nuclide inventory and decay from the EURAD European project
Dimitri Alexandre Rochman^{1,*}, Francisco Álvarez-Velarde², Ron Dagan³, Luca Fiorito⁴, Sijja Häkkinen⁵, Peter Schillebeeckx⁶, Marcus Seidl⁸

Spent fuel characterization analysis using various nuclear data libraries
Dušan Čalič^a, Marjan Kromar^b
Jožef Stefan Institute (JSI), Slovenia

NENE 2021
30th International Conference Nuclear Energy for New Europe
Comparing Different Approaches to Calculating Decay Heat Power of a Spent Fuel Dry Storage Cask for Krško NPP
M3 sam
Zeljko Husin

Annals of Nuclear Energy
On the use of criticality and depletion benchmarks for verification of nuclear data
L. Fiorito^{a,*}, P. Romojaro^b, O. Cabellos^b, M. García-Hormigos^c, A. Hernandez-Solis^d, S. Sánchez-Fernández^e, A. Stankovskiy^f, G. Van den Eynde^g, G. Žerovnik^{h,*}

Spent fuel characterization analysis using various nuclear data libraries
Dušan Čalič^a, Marjan Kromar^b
Jožef Stefan Institute (JSI), Slovenia

BOUNDARY CONDITION MODEL CHARACTERIZATION AND FINAL A PWR AS
Augusto Hernandez-Solis¹, Klemen Ambroz², Marjan Kromar³, Peter Schillebeeckx³, Aleksander...

On the use of criticality and depletion benchmarks for verification of nuclear data
L. Fiorito^{a,*}, P. Romojaro^b, O. Cabellos^b, M. García-Hormigos^c, A. Hernandez-Solis^d, S. Sánchez-Fernández^e, A. Stankovskiy^f, G. Van den Eynde^g, G. Žerovnik^{h,*}

 DIVISION DE FUSION NUCLEAR	INFORME	DFN/IN-01/II-21	HOJA 1 DE 28
	REF. EXTERNA		REVISION 0
TITLE: Contribution of CIEMAT to EURAD WPS Task 2.1 on uncertainty propagation in depletion analyses.			
AUTHORS: F. Álvarez-Velarde, S. Panizo Prieto			

- Students: EPFL (A. Shama), CIEMAT (S. Prieto), UPM, JSI (G. Letnar), SCK-CEN (D. Houben, A. Bengoechea, F. Gimaldi)
- Presentations, training courses, meetings: ...

Subtask 2.1: conclusion

- More work is needed, but we have achieved a number of agreed conclusions:

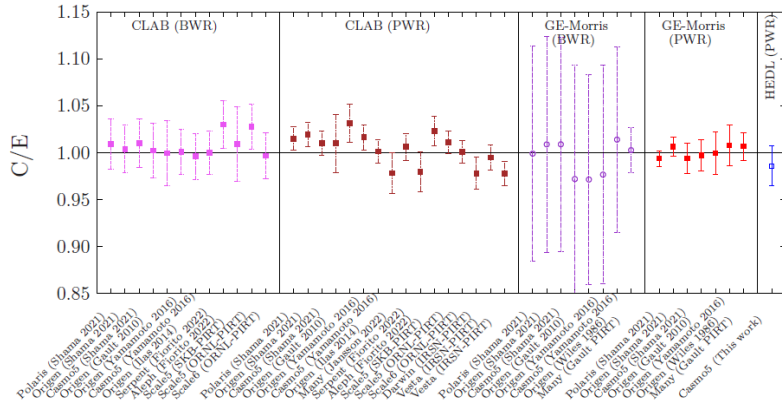


Fig. 7. Plots of the average C/E values for the decay heat

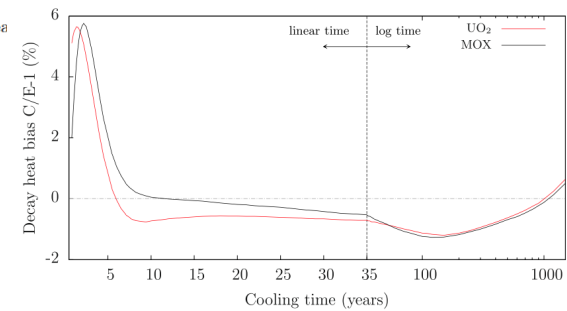
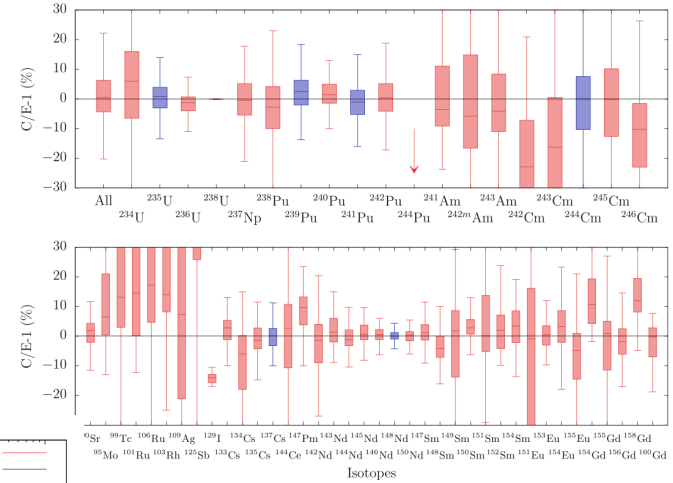


Fig. 9. Decay heat biases obtained from the mean biases on nuclide inventory.

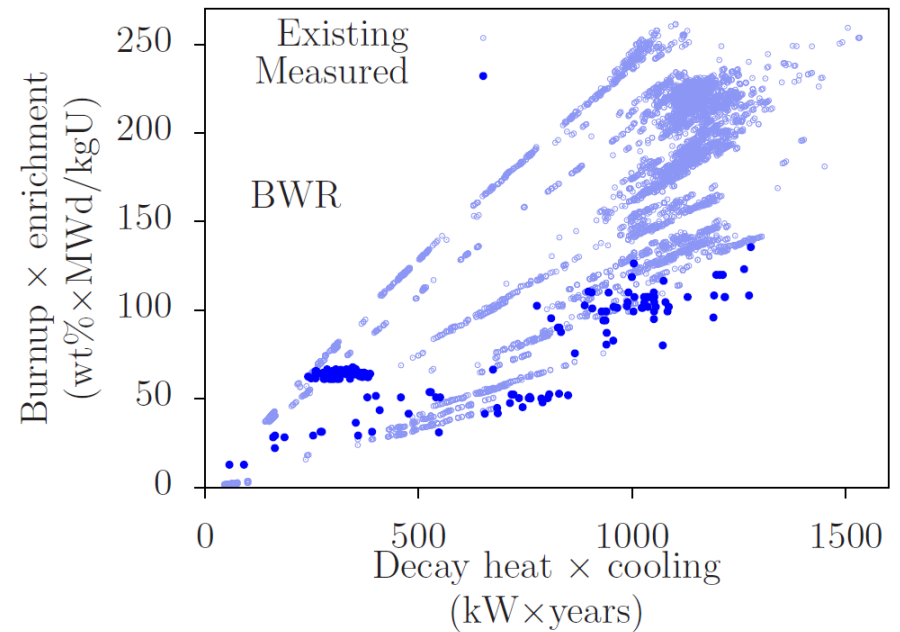
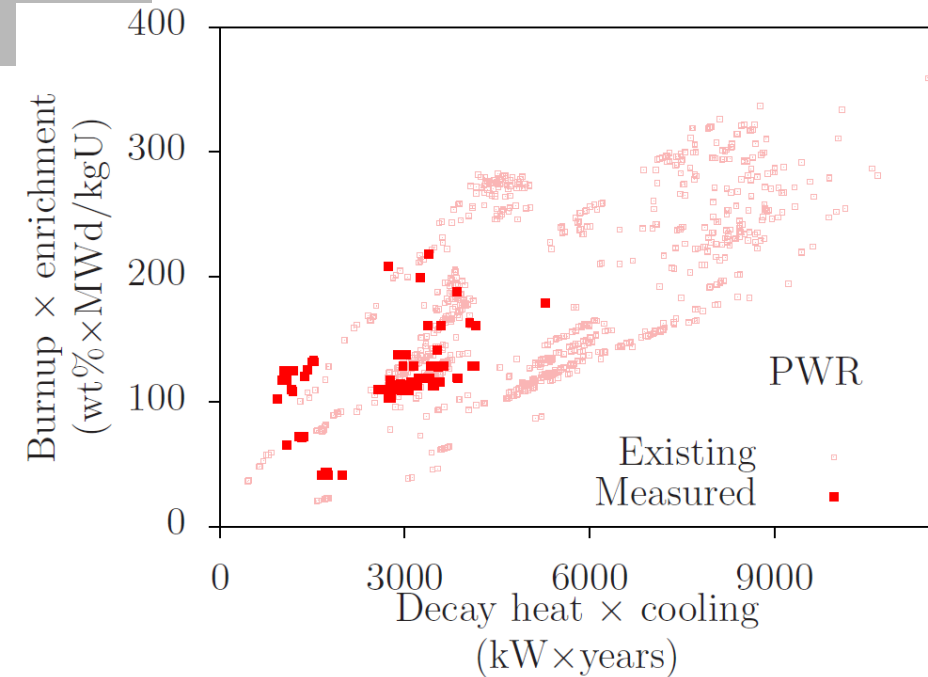
Table 6. Summary of the recommendations concerning some SNF calculated nuclide concentrations and decay heat, for the cooling period between 1 and 1000 years

	^{148}Nd	^{137}Cs	^{235}U	^{239}Pu	Average burnup	Decay heat
Uncertainty	4%	5%	4%	4%	5%	> 4%
Bias	-0.1%	-0.4%	+0.2%	+2.5%	-	See Figure 9

The uncertainty represents one standard deviation (1σ).

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Wir schaffen Wissen – heute für morgen

