



**Oak Ridge National Laboratory
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SUBJECT: Report on Foreign Travel to Paris, France
DATE: July 13, 2023
TO: Dr. Angela Chambers, Nuclear Criticality Safety Program Manager, National Nuclear Security Administration / NA-511
FROM: William J Marshall

MEETING TITLE: Working Party on Nuclear Criticality Safety (WPNCS) and associated Subgroup Meetings

MEETING LOCATION: OECD/NEA Headquarters, Boulogne-Billancourt, France

MEETING DATES: June 26 – 30, 2023

ATTENDEES ON BEHALF OF NCSP: William Marshall, Walid Metwally, and Doug Bowen

MEETING PURPOSE: Review progress in active subgroups and discuss activities of interest at the WPNCS meeting

MEETING BENEFITS TO THE NCSP: Historically, the work going on within this group related to criticality safety and included topics such as Monte Carlo source convergence and clustering, correlations of critical experiments, critical excursion modeling, burnup credit, and validation techniques. Several of the current activities of the Working Party are focused on depletion analysis to support burnup credit and decay heat analysis. This is driven by the interest of other member countries focused on fuel management and disposal issues, and, in the future, is most relevant to and may be sponsored by US NRC and/or DOE NE-8. An NE-8-sponsored US participant from PNNL was present for the meetings, indicating that this expertise is starting to be engaged. Several ORNL participants with expertise in depletion and decay heat analysis participated with support from the NRC. Draft agendas for the week of meetings are included with this trip report, and a summary of the week is provided below as Table 1. Note that SG9 and SG11 are the two groups with direct benefit to NCSP mission space, and both SGs have nearly finished their mandate with only the final report publication remaining. Future NCSP sponsorship of in-person participation of multiple staff members from multiple laboratories should be examined and justified.

Table 1: Summary of WPNCS week meetings

	Monday (6/26)	Tuesday (6/27)	Wednesday (6/28)	Thursday (6/29)	Friday (6/30)
Morning	SG9	SFCOMPO TRG	SG12	SG11	WPNCs
Afternoon	SG10		Ad hoc mtg*	SG13	

* Ad hoc meeting was a combination of SFCOMPO TRG and SG12



Subgroup summaries:

- SG9 Monte Carlo transport in stochastic media**
- SG10 Depletion analysis of RCA sample**
- SG11 Bias determination with correlated data**
- SG12 Spent nuclear fuel decay heat**
- SG13 USL comparison for BUC**

As indicated by the allocated meeting time, approximately 3 of the 4 days of subgroup meetings were dedicated to activities largely unrelated to NCSP-sponsored activities.

A proposal is being generated for a new subgroup to extend the work of SG11 on validation with Bayesian methods with the specific goal of determining if the various methods in use can identify the correct value when a known error has been introduced.

A proposal for a new subgroup continuing the work of SG10 into an examination of the nuclear data uncertainties on the depletion analysis is also expected in the next year. This will be the third subgroup in a series with the goal of examining nuclear data uncertainty impacts on depletion. The first subgroup selected an RCA sample to study (SG7) and SG10 is the second phase, performing the depletion comparisons.

Additional subgroup proposals are likely also to be forthcoming from the decay heat effort. This led to some discussion at the WPNCS meeting on Friday of creating a new Working Party focused more on issues associated with spent fuel management and repository studies. NEA indicated that creating a new Working Party is likely beyond their available secretariat capacity. The underlying conflict for how to best utilize the nominally allowed 5 active subgroups has been left unresolved until such time as subgroup proposals are presented to the WPNCS. It is conceivable that in the near future, 4 or 5 of the active subgroups could be related to the analysis and management of commercial spent nuclear fuel facilities.

PURPOSE OF TRAVEL

Attend and participate in meetings and discussions.

Persons Contacted at TRG meetings

A large number of in-person and virtual participants were involved in the meetings across the entire week of meetings. A complete attendee list is available from the NEA WPNCS Secretariat.

Presentations, Chair Responsibilities, Etc.:

Marshall and Bowen are official US representatives to WPNCS

Bowen presented to the WPNCS about ANSI/ANS and ISO standards related to NCS

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