LAWRENCE LIVERMORE NATIONAL LABORATORY
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LLNL

FOREIGN TRIP REPORT

LLNL-MI-796017

DATE: October 31, 2019

SUBJECT: Report of Foreign Travel to Paris, France

TO: Dr. Angela Chambers, USDOE Nuclear Criticality Safety Program Manager, National Nuclear Security Administration, NA-511

FROM: David P. Heinrichs, Nuclear Criticality Safety Division Leader, Lawrence Livermore National Laboratory

MEETING TITLES:

- IRSN-LLNL NCSP Coordination Meeting
- International Criticality Safety Benchmark Evaluation Project (ICSBEP) Meeting
- SINBAD Project Meeting
- International Reactor Physics Experiment Evaluation Project (IRPhE) Meeting

MEETING LOCATIONS:

- Institut de Radioprotection et de Sûreté Nucléaire (IRSN), 31 Avenue de la Division Leclerc, Fontenay-aux-Roses, France
- Organization for Economic Cooperation and Development (OECD), Nuclear Energy Agency (NEA), 46, Quai Alphonse Le Gallo, 92100 Boulogne-Billancourt, Paris, France

MEETING DATES:

October 17-25, 2019

ATTENDEES:

David Heinrichs, Soon Kim, Catherine Percher

OTHER ATTENDEES:

Attendee	Affiliation	Participation
Kelsey Amundson	DNFSB	ICSBEP, IRPhE
Doug Bowen	ORNL, NCSP	ICSBEP
John Bess	INL	ICSBEP, IRPhE, SINBAD
Maria Brovchenko	IRSN	IRSN, ICSBEP
Isabelle Duhamel	IRSN	IRSN, ICSBEP
Matthieu Duluc	IRSN	IRSN
Veronique Dumont	IRSN	ICSBEP, SINBAD
Eric Dumonteil	IRSN	IRSN
Stéphane Evo	IRSN	IRSN, ICSBEP
Max Fratoni	UC-Berkeley	IRPhE
Masahiro Fukushima	Japan Atomic Energy Agency	ICSBEP, IRPhE, SINBAD
Satoshi Gunji	Japan Atomic Energy Agency	ICSBEP, IRPhE, SINBAD
Gary Harms	SNL, NCSP	ICSBEP, IRPhE, SINBAD
Jason Haverkamp	Naval Nuclear Laboratory	ICSBEP, IRPhE, SINBAD
Ayman Hawari	North Carolina State University	IRPhE
Ian Hill	OECD NEA	ICSBEP, IRPhE, SINBAD
Jesson Hutchinson	LANL, NCSP	ICSBEP, IRPhE
Evgeny Ivanov	IRSN	ICSBEP, IRPhE, SINBAD
Tatiana Ivanova	OECD NEA	ICSBEP, IRPhE, SINBAD
Yosuke Iwamoto	Japan Atomic Energy Agency	ICSBEP, IRPhE, SINBAD
Vlastimil Juricek	Research Center Řež (Czech)	IRPhE
Anatoly Kochetkov	SCK CEN (Belgium)	IRPhE
Ivo Kodeli	Jožef Stefan Institute (Slovenia)	SINBAD
Tamara Korbut	JINPR-SOSNY (Belorussia)	ICSBEP, IRPhE, SINBAD
Thomas Kozlowski	University of Illinois	ICSBEP
Nicolas Leclaire	IRSN	ICSBEP, IRPhE
B. J. Marshall	ORNL, NCSP	ICSBEP, IRPhE, SINBAD
Julie-Fiona Martin	OECD NEA	ICSBEP, IRPhE, SINBAD
Geordie McKenzie	LANL, NCSP	ICSBEP, IRPhE
Alex McSpaden	LANL, NCSP	ICSBEP, IRPhE
Dennis Mennerdahl	E. Mennerdahl Systems (Sweden)	ICSBEP, IRPhE, SINBAD
Thomas Miller	ESS (Sweden)	SINBAD, IRPhE
Wilfred Monange	IRSN	IRSN
Akito Oizumi	Japan Atomic Energy Agency	ICSBEP, IRPhE, SINBAD
Pedro Ortega	SEA (Spain)	SINBAD
Evgeny Rozhikhin	IPPE (Russia)	ICSBEP, SINBAD, IRPhE
Adimir dos Santos	IPEN (Brazil)	ICSBEP, IRPhE, SINBAD
Lori Scott	OECD NEA	ICSBEP, IRPhE, SINBAD
Luka Snoj	Jožef Stefan Institute (Slovenia)	ICSBEP, IRPhE, SINBAD
Nick Thompson	LANL, NCSP	ICSBEP, IRPhE
Andrej Trkov	IAEA	ICSBEP, IRPhE, SINBAD
Francois Trompier	IRSN	IRSN
Suichi Tsuda	OECD NEA	ICSBEP, IRPhE, SINBAD
Tim Valentine	ORNL, NCSP	SINBAD
Mike Zerkle	NNL, NCSP	ICSBEP, IRPhE, SINBAD

MEETING BENEFITS TO NCSP:

IRSN

IRSN is an NCSP partner organization and LLNL meets sporadically with IRSN to discuss ongoing and future joint work under the auspices of the DOE-IRSN MOU.

ICSBEP

The USDOE Office of Defense Programs founded the Criticality Safety Evaluation Project (CSBEP) in 1992 to document and preserve criticality safety benchmark experiments. In 1994, the CSBEP welcomed international participants from France, Hungary, Japan, Russia and the United Kingdom; and in 1995, the DOE allowed the CSBEP to become an official activity of the OECD NEA to further enhance international participation and changed the name to the ICSBEP. As described in the USDOE NCSP Mission and Vision, Five-Year Execution Plan, and C_EdT Manual, the ICSBEP remains an important element of information preservation and dissemination.

SINBAD

The Shielding Integral Benchmark Archive Database (SINBAD) started in the 1990s as a collaboration between the OECD NEA Data Bank and Radiation Safety Information Computational Center (RSICC) at ORNL. At present, SINBAD is a large compendium of 'shielding' integral experiments, which historically was devoted to the collection and preservation of the experimental information with little emphasis on evaluation. A recent and ongoing effort championed by Ivan Kodeli[1], Jožef Stefan Institute, Slovenia, is to review selected contents for the completeness of the experimental information, evaluate the experimental sources of uncertainty, and prepare improved and more modern computer code models. This effort is benefitting the NCSP by providing evaluated shielding benchmark data with uncertainty estimates. A subset of these shielding integral experiment benchmarks benefit NCSP either directly for shielding validation purposes used in the calculation of criticality accident doses, nuclear accident dosimetry, or criticality accident alarm response; or indirectly in validating nuclear data at energies applicable to fission systems. Other contents of the compendium, such as high energy accelerator shielding experiments, are not applicable to NCSP due to their higher energies or other particles.

IRPhE

The International Reactor Physics Experiment Evaluation (IRPhE) Project is a follow-on to the ICSBEP focused on the totality of experimental reactor physics data including, but not limited to, critical data. A subset of the critical data benefits NCSP. However, due to the physical complexity of real reactor systems, uncertainties in this critical data is often much too large (e.g., > 1% Δk) to benefit NCSP users or inform nuclear data evaluation.

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[1] Ivan Kodeli et al., "20 Years of SINBAD (Shielding Integral Benchmark Archive and Database)," Progress in Nuclear Science and Technology, Volume 4 (2014) pp. 308-311; http://www.aesj.or.jp/publication/pnst004/data/308_311.pdf.

MEETING PURPOSE:

IRSN

The agenda for the IRSN-LLNL meeting is attached with some elaboration below.

- Subcritical experiments

Dave Heinrichs expressed LLNL's sincere appreciation and thanks to Stephane Evo for the external review and independent simulation results provided by Wilfried Monange for the ISSA subcritical (multiplicity) benchmark. The excellence of this benchmark and its unprecedented agreement between measured and simulated results (using FREYA) is indicated by its selection as the cover for the most recent (2018) edition of the ICSBEP Handbook.

LLNL and IRSN discussed additional analysis of the ISSA data in the time and frequency domains to determine the 'Rossi-alpha'. This technique was applied successfully by Adimir dos Santos in his evaluation to be presented at the ICSBEP meeting the following week. A joint LLNL-SNL-IRSN measurement campaign of one week duration is envisioned at SNL using the LLNL ^{3}He tubes and data acquisition system. Feynman and Rossi data analysis techniques at or near critical will determine β_{eff} and α; and by extrapolation and inference, the prompt neutron lifetime. The proposed timeframe for these measurements is January 2020. Later repeating these measurements with IRSN tubes is also envisioned.

- TEX Experiments

Catherine Percher and Dave Heinrichs expressed LLNL's thanks and appreciation to Stephane Evo for the excellent and timely external review provided by Mariya Brovchenko, and her continued support for the TEX Pu baseline evaluation at ICSBEP the following week. This evaluation is comprehensive and the uncertainty assessment was time consuming and complex requiring a considerable effort by Catherine Percher to prepare, and Mariya Brovchenko to review. The entire portfolio and schedule of follow-on TEX experiments was also reviewed and discussed.

- Benchmark Intercomparison

Dave Heinrichs requested Isabelle Duhamel present the results of the first phase of the benchmark intercomparison to the Cross Section Evaluation Working Group (CSEWG) at Brookhaven National Laboratory during Nuclear Data Week. At present, only a few individual contributions of limited scope are provided using one production method at the Validation session. The benchmark intercomparison provides a much needed broader perspective. The possibility of expanding the benchmark intercomparison to include beta-effective benchmarks was discussed as well as the ongoing LLNL-NNL collaboration in this area. A summary report with 22 benchmarks is in preparation for presentation at BNL on November 4, 2019.

- Criticality Accident Experiments

The status of IER-406 and AFFRI were discussed. IRSN and LLNL also agreed that Francois Trompier (IRSN) and Dan Stone (LLNL) will prepare a proposal for FY-2021 to request a one-week experimental campaign at Godiva with two bursts for nuclear accident dosimetry (NAD) testing and training of personnel. The status of the LLNL PNS with TLDs and the IRSN 'active' PNS were discussed. The possibility of further commissioning tests at LLNL, NPL (UK), and CEA-Cadarache (France) were discussed.

- 2020 Portfolio and 2021 Proposals

The status of all ongoing work was discussed as well as a number of possible future proposals.

ICSBEP

As shown in the attached agenda, three new NCSP evaluations were reviewed by members of the ICSBEP Technical Review Group (TRG) constituted from the meeting attendees listed above. Of these, two NCSP evaluations were "approved" for publication, pending adequate resolution of the review comments, in the next (2019) edition of the International Handbook of Evaluated Criticality Safety Benchmark Experiments:

- LEU-COMP-THERM-101, Partially-Reflected Water-Moderated Square-Pitched U(6.90)O_2 Fuel Rod Lattices with 0.52 Fuel to Water Volume Ratio (0.855 cm Pitch), Gary Harms and David Ames, Sandia National Laboratories

- PU-MET-MIXED-002, TEX Plutonium Baseline Assemblies: Plutonium/Aluminum Metal Alloy Plates with Varying Thicknesses of Polyethylene Moderator and a Thin Polyethylene Reflector, Catherine Percher, Lawrence Livermore National Laboratory

In addition to the NCSP evaluators (Gary Harms, Catherine Percher), the independent external reviewers (Nicholas Leclaire, Mariya Brovchenko) from IRSN were in attendance to defend these evaluations. Approval for publication, pending adequate resolution of review comments, completes NCSP CED-4a milestones as defined in the NCSP Critical & Subcritical Experiment Design Team (C_EdT) Process Manual and specified in the NCSP Five-Year Execution Plan tasks for LLNL and SNL for FY-2019.

- HEU-MET-FAST-101, KRUSTY: Beryllium-Oxide and Stainless-Steel Reflected Cylinder of HEU Metal, Kristin Smith, Theresa Cutler, LANL

As predicted, HEU-MET-FAST-101 was not approved during the meeting as it was determined to still in the developmental (evaluation) phase. Unfortunately, neither evaluator was in attendance at the meeting and the evaluation was represented by Jesson Hutchinson. As a path forward, the TRG recommended the evaluators complete the evaluation and internal review and then submit to Dr. John Bess, ICSBEP Chair, to coordinate the independent external review per protocol. Depending on the timeliness of these reviews, it may be possible to then convene a TRG for final pre-publication review in support of publication in the next (2019) edition of the Handbook. If not, the evaluation may be resubmitted for consideration during the next ICSBEP meeting tentatively convened for October 19-23, 2020, at OECD NEA Headquarters.

As members of the Technical Review Group, the NCSP and other attendees also participated in review of a significant revision to:

- LEU-COMP-THERM-074, 4.738-wt.%-Enriched-Uranium-Dioxide-Fuel-Rod Arrays in Water, Reflected or Separated by Various Structural Materials (Aluminum, Concrete, Copper, Glass, Iron, Lead, Nickel, Titanium, Zirconium), Nicolas Leclaire, IRSN

This evaluation was revised to now include complete data for the MIRTE-1 experiments, which were previously unavailable due to restriction as proprietary information. Note that several NCSP participants including Dave Heinrichs and Mike Zerkle previously reviewed this evaluation (c. 2012) having signed the appropriate non-disclosure agreements.

The following three foreign evaluations were also accepted pending adequate resolution of the TRG comments:

- SUB-LEU-COMP-THERM-003, IPEN/MB-01 Subcritical Measurements Employing Boric Acid in the Moderator, Adimir dos Santos, Instituto de Pesquisas Energéticas e Nucleares (IPEN), Brazil

- LEU-SOL-THERM-013, TRACY: Unreflected 10%-Enriched Uranyl Nitrate Solution in a 50-cm-Diameter Annual Tank with Neutron Absorber, Satoshi Gunji, JAEA, Japan

- PU-SOL-THERM-041, 500 x 200 Annual Cylinders Containing Plutonium Nitrate Solutions with 3 wt.% ^{240}Pu, Veronique Dumont, Nicolas Leclaire, IRSN, France

The IPEN/MB-01 evaluation is based on measurements of the inverse prompt reactor period, or 'negative alpha' in both the time (i.e., Rossi alpha) and frequency domains. As discussed with dos Santos, insufficient information is provided in this evaluation to directly simulate the measured detector counts as a function of time. However, this benchmark 'as is' is still valuable as a 'negative alpha' benchmark with inferred subcritical k-eff values.

The TRACY and Pu solution benchmarks are excellent additions to the ICSBEP Handbook and are useful for validation of NCSP analytical methods for determining subcritical (safety) margins.

The Czech Republic provided a draft evaluation to external reviewers in advance of the meeting:

- Fast Neutron Leakage from Iron Spheres with ^{252}Cf Source in Center, Michael Kostal, CV REZ, Czech Republic

Unfortunately, the evaluator was unable to respond to external review comments and the evaluation was discussed but not reviewed further at the meeting. This experiment appears very valuable for the nuclear data evaluation of (fast) iron cross sections.

The ICSBEP meeting concluded with:

- A description of critical and subcritical facilities in Belorussia by Tamara Korbut
- A discussion of problems in evaluating LANL/JAEA lead-void experiments by Akito Oizumi
- Review/classification of benchmark quality by Catherine Percher

Unfortunately, there was insufficient time available to discuss the remaining agenda items, namely:

- status report on the ICSBEP Database (DICE) by Ian Hill
- Uncertainty and Reviewer Guides, Correlation Matrices by John Bess
- Evaluations Planned for 2020 Submission

The meeting adjourned following announcement that the next meeting will be convened on October 19-23, 2020, at OECD NEA Headquarters.

SINBAD

As shown in the attached agenda, the SINBAD meeting began with a review of two foreign evaluations that were also presented at the previous (2018) meeting:

- HCLL Frascati Lead-Lithium Breeding Experiment, Pedro Ortega, SEA, Spain

- HIMAC Experiments with He, C, Ne, Ar, Fe, Xe, and Si ions on C, Al, Cu and Pb Targets, Shuichi Tsuda, JAEA, Japan

As noted in last year's trip report, these particular experiments are not useful benchmarks for NCSP users because: (a) the eutectic PbLi bricks have unquantifiable density gradients resulting in unquantifiable uncertainties in the benchmark values; and (b) the HIMAC accelerator experiment involves heavy ions at energies in excess of 100 MeV.

A new evaluation was also presented:

- FNG Copper Block, Ivo Kodeli, Jozef Stefan Institute, Slovenia

This evaluation is in the development (evaluation) phase and is anticipated to provide unique information of value for nuclear data evaluation of the copper cross sections at energies of 14 MeV and below. LLNL proposes therefore to participate in the external review of this evaluation and plans to provide independent simulation results including simulation of the deuteron beam.

LLNL also provided an informal progress report on modern evaluation of the LLNL 'Pulsed Spheres' NTOF experiments. This effort commenced in FY-2019 with internal funding and continues in FY-2020 under US DOE NCSP auspices.

IRPhE

As shown in the attached agenda, one revised and four new evaluations were presented and reviewed at the IRPhE meeting:

- MSRE-MSR-RESR-001, Molten-Salt Reactor Experiment (MSRE) Zero-Power First Critical Experiment with ^{235}U, Max Fratoni and Dan Shen, University of California, Berkeley, USA

This evaluation was approved in the previous (2018) meeting but has been revised to include reactivity coefficients. As noted in last year's report, this evaluation is not useful to NCSP users but will benefit from a thermal scattering law for F-Li-Be, which is in development by NCSU.

- LR(0)-VVER-RESR-005, Criticality Experiments in Hexagonal Lattices (1.275 cm Pitch) of VVER-1000 Low Enriched U(3.3 wt.% U^{235})O_2 Fuel Assemblies in Light Water with Seven Void, Silicon Dioxide or Graphite Modules in Center, Michal Košťál, Vojtech Rypar, Research Center Řež, Czech Republic

This evaluation presented by Vlastimil Juricek was not approved at the meeting and will be resubmitted next year. As a high precision critical experiment useful for the validation of the SiO_2 thermal scattering law developed by NCSU, LLNL will assist in the independent external review.

- LR(0)-VVER-RESR-002, Cross-Section of ^{197}Au(n,γ), ^{58}Ni(n,p), ^{89}Y(n,2n), ^{181}Ta(n,γ) and ^{55}Mn(n,γ) Reactions in Neutron Field of Low Enriched U(3.3 wt.% U^{235})O_2 Core, Michal Košťál, Vojtech Rypar, Research Center Řež, Czech Republic

This evaluation presented by Vlastimil Juricek was not approved at the meeting and will be resubmitted next year. The reaction rates have uncertainties of 3-5% and are useful for the validation of the IRDFF and other dosimetry libraries.

- TREAT-FUND-RESR-003, Transient Reactor Test (TREAT) Facility: M2 Calibration (M2CAL) Steady-State Experiments, Colby Sorrell, Ayman Hawari, North Carolina State University, USA

This evaluation is not useful for NCSP users due to large uncertainties in the benchmark k_{eff} value (1σ = 0.0132). However, as TREAT was restarted in 2017, this evaluation may be useful for pedagogical purposes or for determining values relative to a baseline (e.g., transient analysis).

- ZPR-GCFR-EXP-001, ZPR-9/29: Gas Cooled Fast Reactor Critical Experiments – Phase II, Rich Lell, Argonne National Laboratory, USA

The reported critical value for this benchmark is $k_{eff} = 0.9993 \pm 0.0007$ (case 1). However, this benchmark as well as the other ZPR/ZPPR benchmarks does not address: (a) uncertainties due to fuel impurities; (b) uncertainties in plate dimensions; and, (c) uncertainty in the age of the isotopes. Therefore, the reported uncertainty may be significantly underestimated.

ATTACHMENTS:

- IRSN-LLNL Meeting [Agenda], October 17, 2019
- Final Agenda, International Criticality Safety Benchmark Evaluation Project (ICSBEP), 21-22 October 2019
- Final Agenda, Shielding Integral Benchmark Archive Database (SINBAD), 23 October 2019
- Final Agenda, International Reactor Physics Experiment Evaluation Project (IRPhEP), 24-25 October 2019

DISTRIBUTION:

Approved by Lawrence Livermore National Laboratory for unlimited distribution.

IRSN-LLNL Meeting

10/17/2019 – 9h30-14h00

Place: .....IRSN – Fontenay-Aux-Roses – Building 25 – Room 007

Participants:

- D. HEINRICHS (LLNL)
- C. PERCHER (LLNL)
- S. KIM (LLNL)
- S. EVO (IRSN)
- I. DUHAMEL (IRSN)
- M. DULUC (IRSN)
- F. TROMPIER (IRSN)
- W. MONANGE (IRSN)
- E. DUMONTEIL (IRSN)

Agenda

1. Sub-critical experiments
    a. Experiments envisioned at SANDIA SPRF/CX
    b. Future work and collaboration

2. TEX experiments
    a. On-going programs
    b. Future work and collaboration

3. Benchmark Intercomparison

4. Criticality accident experiments
    a. IER406
    b. Next international dosimetry exercice

5. Discussions

6. Lunch

International Benchmarks Annual Technical Review Group Meeting
OECD NEA: 21 – 25 October 2019

International Criticality Safety Benchmark Evaluation Project (ICSBEP)

FINAL AGENDA

21 – 22 OCTOBER 2019
46, quai Alphonse Le Gallo, 92100 Boulogne-Billancourt, Paris France
Room BB10

Meeting Registration: http://www.oecd-nea.org/confdb/confdb/conf?id=389

Upon arrival please report to the Reception Desk on the ground floor with a photo ID.
A badge will be issued that will allow you to enter the premises at all times during the meeting.

Local information about hotels and transport, as well as an area map, can be found on the Web page:
http://www.oecd-nea.org/general/practical/

Monday, 21 October 2019 (ICSBEP)

8:45 – 9:00	**SESSION 1:**	**WELCOME AND INTRODUCTION**	
		Welcome and Introduction	Tatiana Ivanova John Bess
		Administrative Items: Sign-In, List of Experiment for Next Year	Lori Scott
9:00 – 10:30	**SESSION 2:**	**DISCUSSION OF EVALUATIONS THAT HAVE BEEN SIGNIFICANTLY REVISED**	
	LEU-COMP-THERM-074	4.738-wt.%-Enriched-Uranium-Dioxide-Fuel-Rod Arrays in Water, Reflected or Separated by Various Structural Materials (Aluminum, Concrete, Copper, Glass, Iron, Lead, Nickel, Titanium, Zirconium) (Includes complete MIRTE-1 experiment)	Nicolas Leclaire
10:30 – 10:45	**BREAK**		
10:45 – 12:15	**SESSION 3:**	**APPROVAL OF NEW EVALUATIONS**	
	SUB-LEU-COMP-THERM-003	IPEN/MB-01 Subcritical Measurements Employing Boric Acid in the Moderator	Adimir dos Santos
12:15 – 13:15	**LUNCH**		
13:15 – 14:45	**SESSION 4:**	**APPROVAL OF NEW EVALUATIONS (Continued)**	
	LEU-COMP-THERM-101	Partially-Reflected Water-Moderated Square-Pitched U(6.90)O2 Fuel Rod Lattices with 0.52 Fuel to Water Volume Ratio (0.855 cm Pitch)	Gary Harms David Ames
14:45 – 15:00	**BREAK**		
15:00 – 18:00	**SESSION 5:**	**APPROVAL OF NEW EVALUATIONS (Continued)**	
	LEU-SOL-THERM-013	TRACY: Unreflected 10%-Enriched Uranyl Nitrate Solution in a 50-cm-Diameter Annular Tank with Neutron Absorber	Satoshi Gunji
	PU-SOL-THERM-041	500 x 200 Annular Cylinders Containing Plutonium Nitrate Solutions with 3 wt. % ^{240}Pu	Veronique Dumont Nicolas Leclaire

International Benchmarks Annual Technical Review Group Meeting
OECD NEA: 21 – 25 October 2019

Tuesday, 22 October 2019 (ICSBEP)

8:50 – 9:00		**WELCOME BACK**	
9:00 – 10:30	**SESSION 6:**	**APPROVAL OF NEW EVALUATIONS (Continued)**	
	PU-MET-MIXED-002	TEX Plutonium Baseline Assemblies: Plutonium/Aluminum Metal Alloy Plates with Varying Thicknesses of Polyethylene Moderator and a Thin Polyethylene Reflector	Catherine Percher
10:30 – 10:45	**BREAK**		
10:45 – 12:15	**SESSION 7:**	**APPROVAL OF NEW EVALUATIONS (Continued)**	
	HEU-MET-FAST-101	KRUSTY: Beryllium-Oxide and Stainless-Steel Reflected Cylinder of HEU Metal	Kristin Smith Theresa Cutler
12:15 – 13:15	**LUNCH**		
13:15 – 14:45	**SESSION 8:**	**DISCUSSION**	
		IAEA – CONDERC Integral Databases	Arjan Koning Andre Trkov
		CV REZ – Fast Neutron Leakage from Iron Spheres with ^{252}Cf Source in Center	Michal Kostal
14:45 – 15:00	**BREAK**	**GROUP PHOTO**	Everyone
15:00 – 18:00	**SESSION 9:**	**DISCUSSION (Continued)**	
		JINPR-SOSNY – TBD	TBD
		JAEA/LANL – Pb-Voiding Collaborative Experiments	LANL/JAEA
		ICSBEP Database (DICE)	Ian Hill
		Handbook Publication & Distribution Guidance	Tatiana Ivanova
		Uncertainty & Reviewer Guides, Correlation Matrices	John Bess
		WPNCS SG-8 – Review/Classification of Benchmark Quality	John Bess
		Evaluations Planned for 2020 Submission	All
		Next Technical Review Meetings	Tatiana Ivanova
		Adjourn	John Bess

International Benchmarks Annual Technical Review Group Meeting
OECD NEA: 21 – 25 October 2019

Shielding Integral Benchmark Archive Database (SINBAD)

FINAL AGENDA

23 OCTOBER 2019

46, quai Alphonse Le Gallo, 92100 Boulogne-Billancourt, Paris France

Room BB2

Meeting Registration: http://www.oecd-nea.org/confdb/confdb/conf?id=389

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Wednesday, 23 October 2019 (SINBAD)

8:45 – 9:00	**SESSION 1:**	**WELCOME AND INTRODUCTION**	
		Welcome and Introduction	Tatiana Ivanova John Bess
		Administrative Items: Sign-In, List of Experiment for Next Year	Lori Scott
9:00 – 10:30	**SESSION 2:**	**DOCUMENTATION & GUIDES**	
		SINBAD Evaluation Guide	Pedro Ortego
10:30 – 10:45	**BREAK**		
10:45 – 12:15	**SESSION 3:**	**APPROVAL OF NEW EVALUATIONS**	
	HIMAC ACC-SEC-VOD-VAC-PNT-001-F	HIMAC Experiments with He, C, Ne, Ar, Fe, Xe and Si Ions on C, Al, Cu & Pb Targets	Shuichi Tsuda
12:15 – 13:15	**LUNCH**		
13:15 – 14:45	**SESSION 4:**	**APPROVAL OF NEW EVALUATIONS (Continued)**	
	FNG-HCLL FUS-TBR-BLK-BRE-PNT-001-TR	HCLL – Fascati Lead-Lithium Breeding Experiment	Pedro Ortego
14:45 – 15:00	**BREAK**	**GROUP PHOTO**	Everyone
15:00 – 16:00	**SESSION 5:**	**DISCUSSION OF DRAFT EVALUATIONS**	
	FNG-Cu	FNG Copper Block	Ivo Kodeli
16:00 – 18:00	**SESSION 6:**	**DISCUSSION**	
		WPEC SG-47 – Use of SINBAD for Nuclear Data Validation	Ivo Kodeli
		Closing Discussions	John Bess
		Evaluations Planned for 2020 Submission	All
		Next Technical Review Meetings	Tatiana Ivanova
		Adjourn	John Bess

International Benchmarks Annual Technical Review Group Meeting
OECD NEA: 21 – 25 October 2019

International Reactor Physics Experiment Evaluation Project (IRPhEP)

FINAL AGENDA

24 – 25 OCTOBER 2019

46, quai Alphonse Le Gallo, 92100 Boulogne-Billancourt, Paris France

Room BB10

Meeting Registration: http://www.oecd-nea.org/confdb/confdb/conf?id=389

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Thursday, 24 October 2019 (IRPhEP)

8:45 – 9:00	**SESSION 1:**	**WELCOME AND INTRODUCTION**	
		Welcome and Introduction	Tatiana Ivanova John Bess
		Administrative Items: Sign-In, List of Experiment for Next Year	Lori Scott
9:00 – 10:30	**SESSION 2:**	**APPROVAL OF EVALUATIONS THAT HAVE EBEN REVISED TO INCLUDE ADDITIONAL DATA**	
	MSRE-MSR-RESR-001 **CRIT-RRATE-COEF**	Molten-Salt Reactor Experiment (MSRE) Zero-Power First Critical Experiment with ^{233}U	Dan Shen Max Fratoni
10:30 – 10:45	**BREAK**		
10:45 – 12:15	**SESSION 3:**	**APPROVAL OF NEW EVALUATIONS**	
	LR(0)-VVER-RESR-005 **CRIT**	Criticality Experiments in Hexagonal Lattices (1.275 cm Pitch) of VVER-1000 Low Enriched U(3.3 wt.% U^{235})O_2 Fuel Assemblies in Light Water with Seven Void, Silicon Dioxide or Graphite Modules in Center	Michal Košťál Vojtech Rypar
12:15 – 13:15	**LUNCH**		
13:15 – 14:45	**SESSION 4:**	**APPROVAL OF NEW EVALUATIONS (Continued)**	
	LR(0)-FUND-RESR-002 **CRIT-RRATE**	Cross-Section of $^{197}Au(n,\gamma)$, $^{58}Ni(n,p)$, $^{89}Y(n,2n)$, $^{181}Ta(n,\gamma)$ and $^{55}Mn(n,\gamma)$ Reactions in Neutron Field of Low Enriched U(3.3 wt.%) U^{235})O_2 Core	Michal Košťál Vojtech Rypar
14:45 – 15:00	**BREAK**		
15:00 – 18:00	**SESSION 3:**	**APPROVAL OF NEW EVALUATIONS (Continued)**	
	TREAT-FUND-RESR-003 **CRIT**	Transient Reactor Test Facility (TREAT): M2 Calibration (M2CAL) Steady-State Experiments	Colby Sorrell Ayman Hawari

Friday, 25 October 2019 (IRPhEP)

8:50 – 9:00		**WELCOME BACK**	
9:00 – 10:30	**SESSION 4:**	**APPROVAL OF NEW EVALUATIONS (Continued)**	
	ZPR-GCFR-EXP-001 **CRIT-SPEC-REAC**	ZPR-9/29: Gas Cooled Fast Reactor Critical Experiments – Phase II	Rich Lell
10:30 – 10:45	**BREAK**	**GROUP PHOTO**	Everyone
10:45 – 12:15	**SESSION 5:**	**DISCUSSION**	
		IRPhEP Database (IDAT)	Ian Hill
		Handbook Publication & Distribution Guidance	Tatiana Ivanova
		Letter of Support for BWR Benchmark Development	John Bess
		Uncertainty & Reviewer Guides, Correlation Matrices	John Bess
		Evaluations Planned for 2020 Submission	All
		Next Technical Review Meetings	Tatiana Ivanova
		Adjourn	John Bess