NSC Activities: Main Highlights

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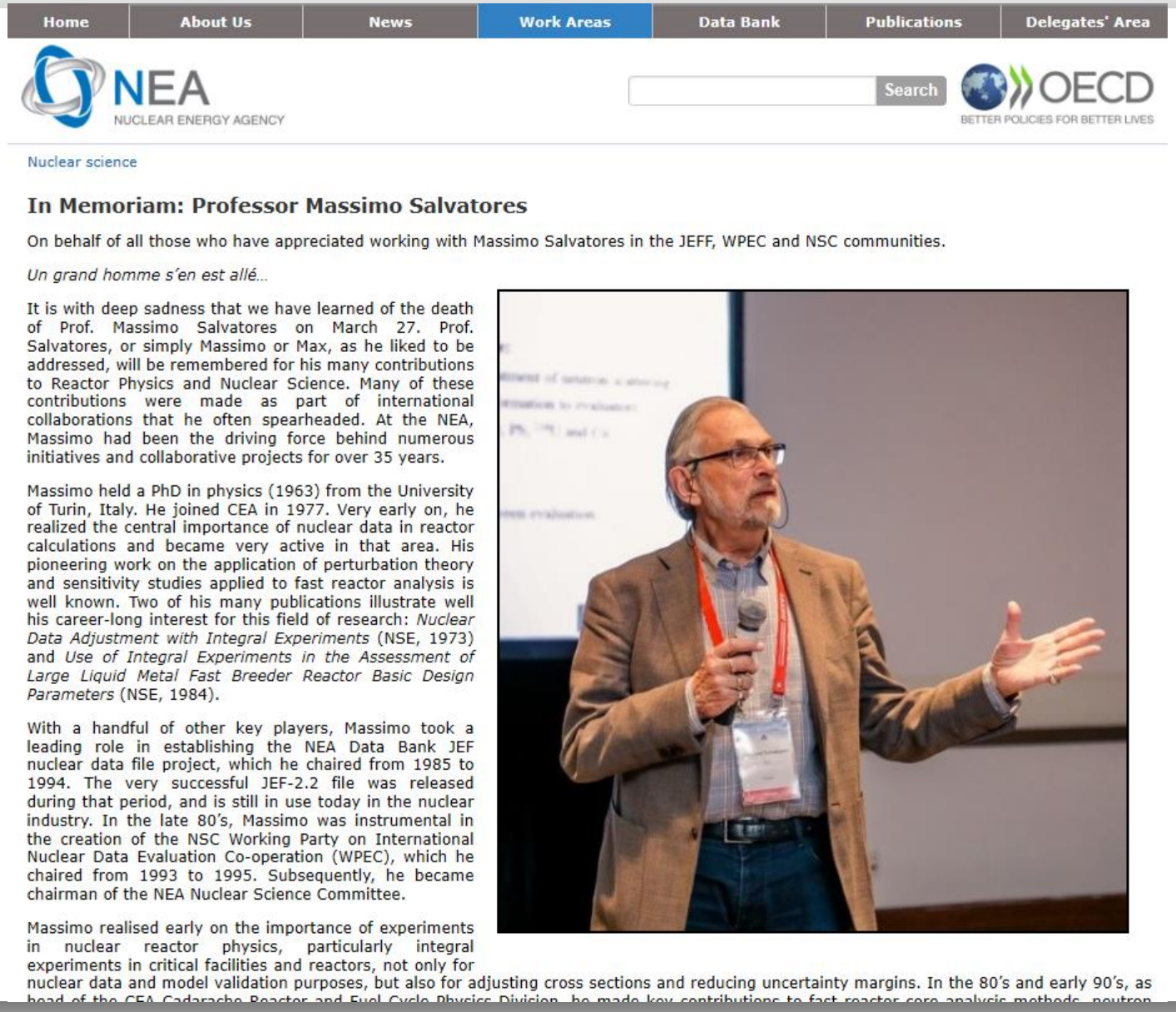
WPEC meeting
14 May 2020



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Nuclear science

In Memoriam: Professor Massimo Salvatores

On behalf of all those who have appreciated working with Massimo Salvatores in the JEFF, WPEC and NSC communities.

Un grand homme s'en est allé...

It is with deep sadness that we have learned of the death of Prof. Massimo Salvatores on March 27. Prof. Salvatores, or simply Massimo or Max, as he liked to be addressed, will be remembered for his many contributions to Reactor Physics and Nuclear Science. Many of these contributions were made as part of international collaborations that he often spearheaded. At the NEA, Massimo had been the driving force behind numerous initiatives and collaborative projects for over 35 years.

Massimo held a PhD in physics (1963) from the University of Turin, Italy. He joined CEA in 1977. Very early on, he realized the central importance of nuclear data in reactor calculations and became very active in that area. His pioneering work on the application of perturbation theory and sensitivity studies applied to fast reactor analysis is well known. Two of his many publications illustrate well his career-long interest for this field of research: *Nuclear Data Adjustment with Integral Experiments* (NSE, 1973) and *Use of Integral Experiments in the Assessment of Large Liquid Metal Fast Breeder Reactor Basic Design Parameters* (NSE, 1984).

With a handful of other key players, Massimo took a leading role in establishing the NEA Data Bank JEF nuclear data file project, which he chaired from 1985 to 1994. The very successful JEF-2.2 file was released during that period, and is still in use today in the nuclear industry. In the late 80's, Massimo was instrumental in the creation of the NSC Working Party on International Nuclear Data Evaluation Co-operation (WPEC), which he chaired from 1993 to 1995. Subsequently, he became chairman of the NEA Nuclear Science Committee.

Massimo realised early on the importance of experiments in nuclear reactor physics, particularly integral experiments in critical facilities and reactors, not only for nuclear data and model validation purposes, but also for adjusting cross sections and reducing uncertainty margins. In the 80's and early 90's, as head of the CEA Cadarache Reactor and Fuel Cycle Physics Division, he made key contributions to fast reactor core analysis methods, neutron

"Un Grand Homme s'en est allé..."

- Chair of the NSC in 1997-2000.
- Chair of numerous NEA activities, including the
  - Working Party on the Physics of Plutonium Recycle (WPPR)
  - WPEC activities
  - JEFF.
- Recently, co-ordinator of the WPEC SG-33, -39 and -46.

https://www.oecd-nea.org/science/memoriam/salvatores/

NSC meeting, June 2019

Changes in the NSC Bureau

- Chair John Herczeg (US) - stepped down in June 2019
- Vice-Chair Alain Zaetta (France) - stepped down in June 2019
- Kemal Pasamehmetoglu (US) – nominated as Chair in June 2019
- Gilles Bignan (France) – nominated as Vice-Chair in June 2019

Main outcome

- Create a task force to review and prioritise the Programme of Work and restructure NSC activities based on the current needs and resources

Prioritisation: Motivation and Objectives

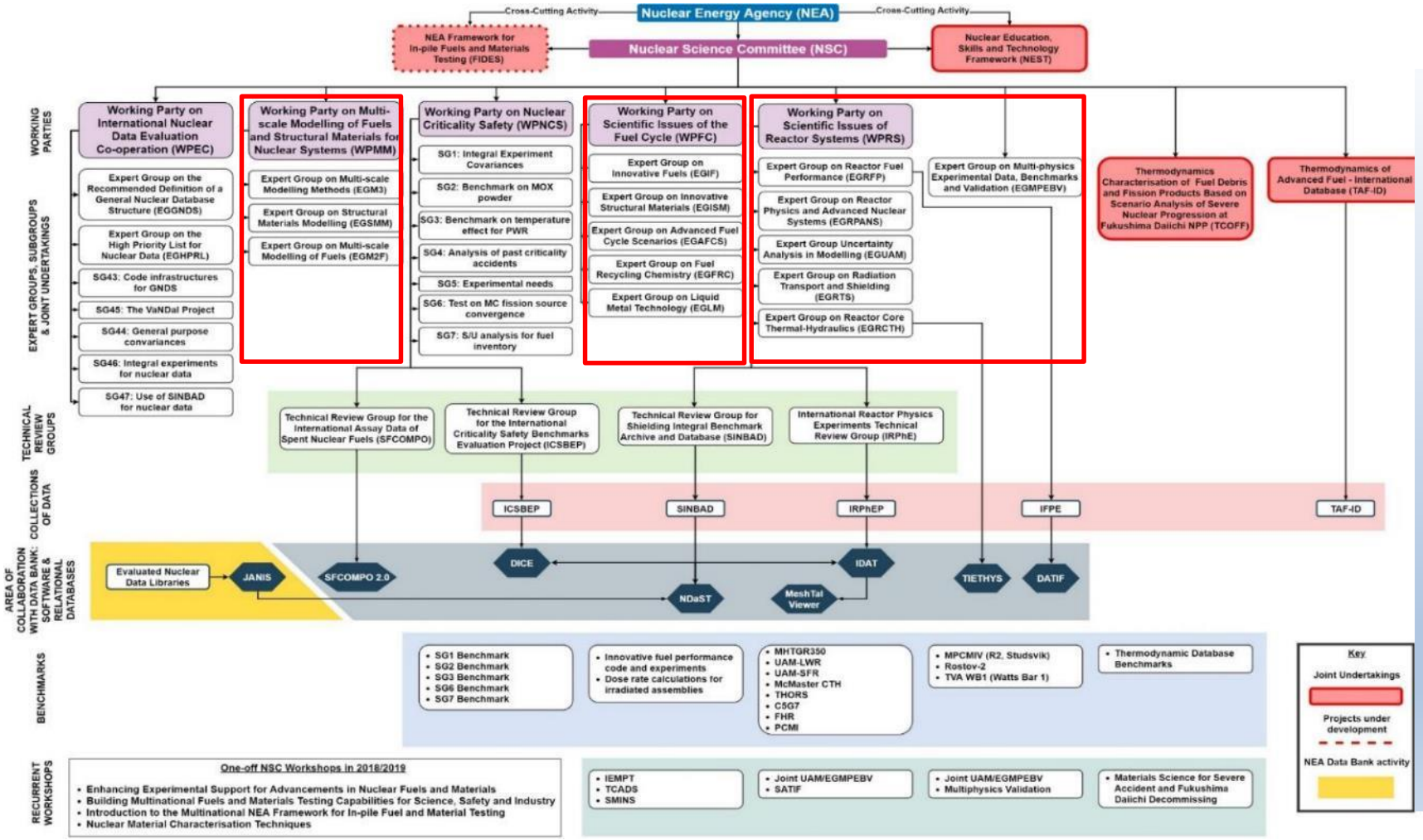
For NEA

- Adjust NEA Programme of Work (PoW) to budget constraints
- Prepare NEA Programme of Work and Budget (PWB) for 2021-2022

For NSC

- **Address the NSC Bureau's request to review PoW (January 2019)**
- Adjust NSC PoW **to the evolving member priorities**
- **Introduce more efficient NSC structure and guidance mechanisms**

Current NSC Structure



PWB 2019

- 7 areas of work
- 26 mandated bodies
- 14 non-mandated bodies (SGs)
- 19 benchmark studies
- 14 publications
- 6+2 data preservation projects
- 5+1 relational databases
- 2 in-house software tools
- 8 workshops (>500 participants)
- 3+2 joint projects

Prioritisation: General Recommendations by the NSC Bureau

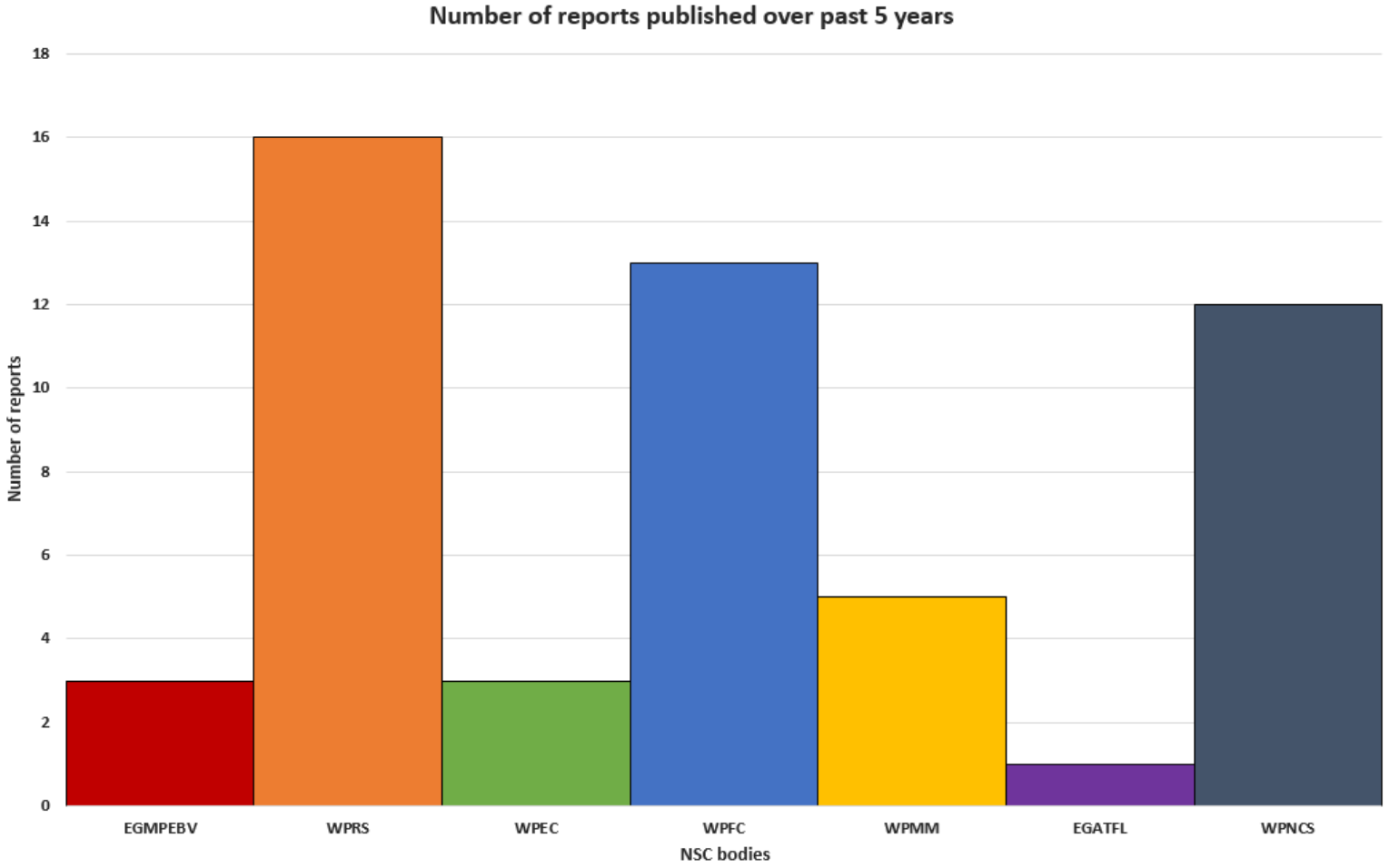
- The NSC Bureau held its meetings in January, March and May 2020 focusing on the prioritisation of NSC activities.
- The areas related to **fuel and material science** as well as **data preservation and evaluation** remain of strategic importance to the NSC programme of work with a particular attention to the initiatives boosting nuclear innovations.
- The WPEC and the Working Party on Nuclear Criticality Safety (WPNCS) will not be reformed.
- *"The focused schedule and deliverables within the Working Party on International Nuclear Data Evaluation Co-operation (WPEC) had been highly effective for over 30 years…", NSC Bureau.*
- Efforts are ongoing to reform 1) the Working Party on Scientific Issues of Rector Systems (WPRS), 2) the Working Party on Scientific Issues of the Fuel Cycle (WPFC) and 3) the Working Party on Multi-scale Modelling of Fuels and Structural Materials for Nuclear Systems (WPMM).

Objectives of the Restructuring

The proposal for restructuring are aimed at:

- incorporating best practices from NSC Working Parties and other NEA committees;
- aligning work done with top down priorities;
- ensuring work is delivered in a timely fashion, and that work is sized realistically with respect to constraints in both time and budget;
- maximising efficiency and reducing organisational overheads;
- accomplishing the above while maintaining the leadership and expertise within the Working Parties and Expert Groups.

NSC Publications (1/2)



Over past 5 years (2015-2019):

- **53 NSC publications**
- ~1000 publications in journals/conferences based on or/and referring to NSC activities
- 2 journal articles (NDS and JNM) in nuclear data and material science fields (2018) with subsequent NEA official report (extended summary in 2019)
- First NSC flagship report on ATF and first webinar (2018)

NSC Publications (2/2)

WP	Report published in past 5 years (2015-2019)	Published in	Downloads	Status
WPNCS	Introduction of Thorium in the Nuclear Fuel Cycle	2015	12272	Official Publication
WPFC	Handbook on Lead-bismuth Eutectic Alloy and Lead Properties, Materials Compatibility, Thermal-hydraulics and Technologies	2015	7253	Official Publication
EGIEMAM	Review of Integral Experiments for Minor Actinide Management	2015	5320	Official Publication
EGATFL	State-of-the-Art Report on Light Water Reactor Accident-Tolerant Fuels	2018	4793	Official Publication
WPFC	State-of-the-Art Report on the Progress of Nuclear Fuel Cycle Chemistry	2018	2805	Official Publication
WPNCS	Perspectives on the Use of Thorium in the Nuclear Fuel Cycle – Extended Summary	2015	2718	Official Publication
WPMM	State-of-the-Art Report on Multi-scale Modelling of Nuclear Fuels	2015	2289	R series Report
WPFC	Workshop Proceedings IEMPT-13	2015	1892	R series Report
WPRS	Benchmark for Neutronic Analysis of Sodium-cooled Fast Reactor Cores with Various Fuel Types and Core Sizes	2015	1417	R series Report
WPRS	SATIF-12 Proceedings	2015	1409	R series Report
WPFC	Workshop Proceedings TCADS-3	2017	1239	R series Report
WPMM	State-of-the-Art Report on Structural Materials Modelling	2016	852	R series Report
WPFC	The Effects of the Uncertainty of Input Parameters on Nuclear Fuel Cycle Scenario	2016	718	R series Report
WPFC	Workshop Proceedings IEMPT-14	2017	620	R series Report
WPNCS	Burn-up Credit Criticality Handbook	2016	591	R series Report
WPNCS	Burn-up Credit Criticality Safety Benchmark Phase III-C	2015	559	R series Report
WPRS	Int. Benchmark on Pressurised Water Reactor Sub-channel and Bundle Tests - Volume III	2015	550	R series Report
WPRS	SATIF-13 Proceedings	2018	462	R series Report
WPRS	Int. Benchmark on Pressurised Water Reactor Sub-channel and Bundle Tests - Volume II	2015	443	R series Report
WPNCS	Evaluation Guide for the Evaluated Spent Nuclear Fuel Assay Database (SFCOMPO)	2015	373	R series Report
WPEC	An Extended Summary of the Collaborative International Evaluated Library Organisation (CIELO) Pilot Project	2019	248	Official Publication
WPEC	Intermediate Report on Methods and Approaches to Provide Feedback from Nuclear and Covariance Data Adjustment	2016	237	R series Report
WPRS	MOX Depletion Calculation Benchmark	2016	191	R series Report
WPFC	Benchmarking of Thermal-Hydraulic Loop Models for Lead-Alloy-Cooled Advanced Nuclear Energy Systems (LACANES)	2018	187	R series Report
WPRS	NEA Benchmark of the Modular High-Temperature Gas-Cooled Reactor 350 MW Core Design Volumes I and II	2017	174	R series Report
WPFC	Overview of User Facilities for Basic Research in the Field of Materials Under Irradiation	2018	124	R series Report
WPFC	Review of Operating and Forthcoming Experimental Facilities in the Field of Advanced Fuel Cycles	2018	94	R series Report
WPNCS	Burn-up Credit Criticality Safety Benchmark-Phase II-E (NEA/NSC/R(2015)1)	2015	68	R series Report
WPNC	NEA Burn-up Credit Benchmark Phase VIII Numerical Benchmark for the Analysis of Small-Sample Reactivity Experiments	2016	53	R series Report
WPRS	A Code to Code Benchmark for High Temperature Gas Cooled Reactor Fuel Element Depletion	2019	39	R series Report

- ~50,000 downloads over 5 years
- Official publications: better visibility, policy level

Recent WPEC Publications

Published

- Specifications for the General Nuclear Database Structure (GNDS)
  May 2020

  Flagship report and policy brief

  https://www.oecd-nea.org/science/pubs/2020/7519-GNDS.pdf
- Thermal Scattering Law S(α,β): Measurement, Evaluation and Application
  Feb. 2020
- International Co-operation in Nuclear Data Evaluation
  July 2019

Submitted for publication

- Processing Covariance Data for the Resonance Region (SG 28)
  April 2020
- Improving Nuclear Data Accuracy of ^{241}Am Capture Cross Section (SG 41)
  April 2020

Thank you for your attention

More information @ www.oecd-nea.org

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