

Expert Group on Radiation Transport & Shielding

Chair: Dr. Robert Grove (U.S.A.)

Members: All NEA member countries

**Regular Observers
(Non-Members):**

**Observer (International
Organisation):** International Atomic Energy Agency (IAEA)

Date of creation: 30th June 2011

Duration: 30th June 2013

Mandate:

Agreed at the 22nd meeting of the Nuclear Science Committee in June 2011
[NEA/SEN/NSC(2011)3]

"Scope

Under the guidance of the Working Party on Scientific Issues of Reactor Systems (WPRS) the Expert Group will perform specific tasks associated with radiation transport and shielding aspects of present and future nuclear systems and accelerator-based irradiation facilities. Nuclear systems considered may include, but are not limited to the following:

- Present generation LWRs and HWRs with advanced and innovative fuels, evolutionary and innovative LWRs and HWRs
- High temperature gas reactors (HTRs)
- Fast spectrum systems and other novel systems including all six of the systems being developed under Gen IV
- Neutronics issues associated fusion systems
- Spent fuel and waste management operations.

The group may also consider radiation transport and shielding for some other types of facilities, including:

- Accelerator, target and irradiation facilities
- Accelerator driven (sub-critical) and critical systems for waste transmutation.

Objectives

To provide expert advice to the WPRS and the nuclear/accelerator communities on the development needs (data and methods, models and codes, validation experiments,) for various nuclear and accelerator systems and scenarios.

To provide specific technical information regarding:

- 3D Radiation Transport Codes and Methods
- Pressure Vessel Surveillance
- Shielding and dosimetry aspects of accelerator, target and irradiation facilities
- Neutron activation and shielding.

This technical information will generally be derived from a combination of direct experimental evidence and/or the results of theoretical benchmark analyses (including sensitivity/uncertainty analysis) using validated modelling methods. In either case the availability of suitable experimental data is a fundamental requirement. A key objective of the group will therefore be to help identify, evaluate and preserve this type of experimental data. In this context the Expert Group will monitor, steer and support the continued development of the International Radiation Shielding Experiments Database (SINBAD), in cooperation with RSICC.

This Expert Group will report to the Working Party on Scientific issues in Reactor Systems (WPRS) and will maintain close links with the International Reactor Physics Experiments (IRPhE) and International Criticality Safety Benchmark Evaluation project. It should also work in co-ordination with the JEFF and EFF NEA Data Bank projects and with the SATIF community of accelerator shielding specialists. Links will also be established with CSWG.

Deliverables (2011-213)

- State-of-the-art report on 3D Radiation Transport Codes & Methods
- Summary report on current status and future development of International Radiation Shielding Experiments Database (SINBAD) - End 2011. To include:
 - priority ‘wish-list’ for future evaluations
 - review of requirements for development of database
 - review of required database contents (e.g. preservation of raw experimental data, code input listings, uncertainty/sensitivity information, C/E comparisons)
 - consideration of need for enhanced review process
- Proposal for study of spectrum unfolding measurement techniques and analysis
- Update to process for quality verification and ranking of SINBAD evaluations taking into account use/availability of original experimental

data, clear delineation of experiment versus benchmark description, completeness, quantification of uncertainties

- Initiate programme of SINBAD evaluations. In particular examples to illustrate good practise, completeness and address issues arising from above reviews
- Coordinate the organisation of and publish the proceedings for the SATIF 11 Workshop.

Meeting frequency

Once per year for full Experts Group with additional meetings in support of particular activities (e.g. SINBAD, SATIF)."