

31 Meeting Nuclear Data Needs for Advanced Reactor Systems

Co-ordinator: H. Harada

Status: Starting

WPEC sub-group proposal

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Title

Meeting Nuclear Data Needs for Advanced Reactor Systems

Justification for a Subgroup

The activities of WPEC Subgroup 26 have identified the nuclear data needs for Advanced Reactor Systems. The most important of the data needs identified by SG-26 were entered into the NEA High Priority Request List (HPRL). Furthermore, because the SG-26 efforts have quantified these data needs and their impact on the selected nuclear systems, the identified primary nuclear data needs were introduced into the HPRL as High Priority data needs. The identification of these priority data needs for Advanced Reactor Systems creates an important opportunity to utilize the collective knowledge of the international nuclear data measurement community to consider the appropriate resources to address and meet these priority needs.

Subgroup Monitor

A. Plompen (IRMM)

Subgroup Coordinator

H. Harada (JAEA)

Subgroup Participants

**Measurement experts*

R. Haight, J. Ullmann, F. Tovesson, R. Nelson, LANL; M. Igashira, Tokyo Tech.; K. Nishio, JAEA; H. Harada, JAEA;

A. Plompen, IRMM; F.-J. Hamsch, IRMM; P. Schillebeeckx, IRMM; D. Cano-Ott, CIEMAT; F. Gunsing, CEA; X. Ledoux, CEA; A. Junghans, FZ Rossendorf; M. Calviani, CERN; L. Tassan-Got, IPN Orsay; K-H. Schmidt, GSI;

**Evaluation experts*

K. Shibata, JAEA (JENDL); experts in Europe to be added, M. Herman, BNL (ENDF), V. Pronyaev, IPPE (BROND), N. Otsuka, IAEA; E. Dupont, OECD/NEA; confirmed

Definition of the project and proposed activities

It is proposed to create a new WPEC Subgroup on “Meeting Nuclear Data Needs for Advanced Reactor Systems.” This group will be comprised primarily of nuclear data measurement experts including each of the international data projects. Some evaluators would be needed as well. The mandate for this new SG will be to:

1. Consider the scope of the priority nuclear data needs identified by SG-26

The mandate of the SG-31 should include all data needs in tables 25-34 of the WPEC SG-26 report, while keeping in mind that the common priorities of tables 31 and 32 were identified to be of highest priority. At the same time, the scope will be limited by the efforts that may be contributed by the specialists who will participate in the activity of SG31.

We should try to find the competent scientists to best cover the requests of SG26.

Action 1: HH & AP nominate candidates at ND2010. (finished)

Action 2: HH ask nominated scientists at ND2010 and by e-mail before May 15.

Action 3: Fixing the participant members. (May 30)

Action 4: The participants will add the needs to be included in the scope, which are not listed in tables 25-34 of SG26 report, if there are strong requests. (June 15)

Action 5: Add comments on the uncertainty listed in SG26 report is reasonable or not (June 30).

On MAs, we will refer the comments of MANREAD. On Major Actinides, we will refer the Appendix A included in SG26 report as one of the starting points.

2. Consider the practicality of meeting those data needs

The measurement experts including each of the international data projects estimate the achievable experimental uncertainties for the reactions listed in the table 32 using current experimental techniques. The measurement experts also identify the main origins of the experimental uncertainties and its expected values.

IAEA’s activity called “MANREAD” will report the investigation on current experimental uncertainties on MAs till the end of 2011. Therefore, SG31 can probably obtain information on current experimental uncertainties on MAs. SG31 concentrates on considering the practicality of meeting those data needs.

Action 6: Assign the part for each member.

Capture: *M. Igashira, H. Harada, P. Schillebeeckx, D. Cano-Ott, F. Gunsing, J. Ullmann*

Fission: *F. -J. Hambsch, M. Calviani, L. Tassan-Got, D. Cano-Ott, K. Nishio, F. Tovesson*

Inelastic: *A. Plompen, A. Junghans, R. Nelson*

6. Recommend collaborative path forward to meet these needs and to address gaps

Action 12: Summarize the output of each project in Action 8 together with the output of SG31, and recommend a proper direction (evaluation approach or new experiment approach. (November 15, 2010)

Anticipated recommendation: Software (analysis method based on scientist's skill) is important as well as Hardware (beam, sample, detectors). Therefore, effectiveness of international collaboration will be stressed in Action 12. We will propose to make an international framework that help collaborations to be done easily.

- Exchange program of scientists, information, beam time, and sample
- Proposal of cross-check experiments using standard samples (Au, Np, Fe etc. depending on the nuclear data)
- Training young scientists

(Note: Above recommendations to be modified based on the discussions in SG-31 before November 15)

Relevance to Evaluated Data Files

Resources to advance quality of Evaluated Data Files to meet accuracy requirement of Advance Reactor Systems

Time-Schedule and Deliverables:

It is anticipated that measurement experts of this SG could complete and document the activities (mandate) 1-6 listed above within 1 year. WPEC should then consider the appropriate means of both:

(a) utilizing their recommendations and

(b) enabling future recommendations, e.g., extension or linkage or incorporation within SG-C (HPRL).

Feasibility recommendation & feedback to HPRL

Date Deliverables

- June, 2010 Review of SG Proposal by WPEC; initiate Subgroup activities*
- September, 2010 Document SG conclusions regarding activities (mandate) 1-5 listed above*
- December, 2010 Present Draft Report of Subgroup activities 1-6 listed above; WPEC consideration of potential implementation of SG recommendations and appropriate "extension" of SG*