Minutes of the HPRL Meeting

OECD/Nuclear Energy Agency
Issy-les-Moulineaux, France
9-10 October 2003

Meeting Participants:

D. Smith (ANL-Illinois, USA), Moderator
T. Fukahori (JAERI-Tokai, Japan)
A. Koning (NRG-Petten, Netherlands)
G. Manturov (IPPE-Obninsk, Russia)
R. McKnight (ANL-Illinois, USA)
C. Nordborg (OECD-NEA, Paris, France)
G. Rimpault (CEA-Cadarache, France)
H. Takano (JAERI-Tokai, Japan)

Executive Summary

A High Priority Request List (HPRL) of nuclear data needed for applications has been in existence under the auspices of the OECD Nuclear Energy Agency (NEA) for several years. Over time this list has become very large and, in the opinion of many people, its effectiveness in stimulating new measurements and evaluations required to meet the expressed needs has suffered as a consequence of its length. At the annual meeting of WPEC in May 2003 it was decided that the HPRL was in need of an overhaul, not only with respect to the included requests but also concerning the procedures used to solicit and retain requests for the list. An ad-hoc expert group, comprising eight nuclear scientists, including one person representing the NEA, was established to prepare a proposal for a revision of the list and for developing new working methods. Consequently, a two-day meeting of this ad-hoc group was held at the OECD NEA headquarters in Issy-les-Moulineaux, France, on 9-10 October 2003, to address problems and issues associated with the HPRL.

The main conclusions from this meeting were:

1. the existing single list should be replaced by two lists, a general request list and a truly high priority list;
2. the total number of requests would be reduced significantly by establishing more stringent criteria for both lists;
3. in order to be included in the high priority list a request would need to be justified by quantitative sensitivity studies (or the equivalent) and sufficiently documented;
4. Subgroup C of WPEC, which was in charge of this list, would be re-established, comprising two representatives from each data project, one from the data user and one from the data producer community;

5. a list of technical consultants would be established to offer guidance on the feasibility and value of submitted requests;
6. both request lists would be subjected to periodic review to determine whether each individual request should continue to be included in these lists;
7. Subgroup C would take an active role in interacting with both the requesters and providers of data.

During the meeting, criteria for inclusion of new requests and retention of old requests were discussed. Plans were begun for a revised NEA Website for this project and assignments were made for reviews of various portions of the existing list in order to ascertain the status of these requests. It was decided that the new procedures discussed at this meeting should be in place and reviews of the existing requests should be completed by May 2004 for final discussion and decision at the next WPEC meeting.

Narrative

The concept of a data request list has a long history in applied nuclear science. The concept is that if requests from applied users of data are collected in a convenient location it should provide a stimulus to measurers, modellers, and evaluators to undertake work that could lead to certain requests becoming satisfied. Various lists have been maintained over the years, e.g., the U.S. Nuclear Data Committee Data Request List and the IAEA World Requests for Nuclear Data (WRENDA). These two particular lists were discontinued several years ago. However, the OECD Nuclear Energy Agency, first under the auspices of the NEANDC and later of the WPEC, has continued this activity. Unfortunately, all of these lists have suffered from several common problems. First among these is that they eventually became too long, because users submitted lengthy lists of requests which were not adequately screened before inclusion. Then, the NEA list acquired the unfortunate designation “high priority”, a term which should not have been applied to such a large quantity of requests. Many of the accepted requests were ill posed in that the requested accuracies, energy ranges, and numbers of reactions and isotopes were often unrealistic. Furthermore, in most cases there was no clearly documented justification for these requests. The consequence of this slippage in quality of the product has been a deterioration of respect accorded by the nuclear science community in general for the so-called High Priority Request List (HPRL). The OECD NEA has recognized these problems and has taken steps to deal with them. The issue was discussed at the May 2003 WPEC meeting in Coronado (San Diego), California, and it was agreed to establish an ad-hoc group to prepare a proposal for the next WPEC meeting.

The NEA Data Bank organized a meeting of the ad-hoc group, comprised of seven invited specialists who represented both the data user and data provider communities (see above). This meeting was held at the OECD NEA headquarters in Issy-les-Moulineaux, France, on 9-10 October 2003. The charge to this working group was to concentrate on establishing new procedures that would serve to alleviate many of the problems encountered in the HPRL project. Attention to individual requests in the existing HPRL would be deferred until these procedural

issues have been resolved and appropriate mechanisms put in place for determining which requests should be retained and which should be eliminated.

C. Nordborg opened the meeting by reminding the attendees of the purpose of the meeting and the charge established by WPEC at its annual meeting earlier in the year. The meeting was then turned over to D. Smith who agreed to serve as the moderator for the following informal discussions. D. Smith asked the attendees to introduce themselves and to then offer some general suggestions as to what they believed to be the key problem areas that should be discussed during the meeting. An agenda for the two-day meeting was then formed based on these comments. The major topics that were discussed and conclusions that were reached during the meeting fell within the following listed categories (not in any particular order):

- The concept of dual lists: one for general requests and one for high priority requests
- Criteria for inclusion of requests in these two lists
- Criteria for elimination of existing requests from these two lists
- Organization of WPEC Subgroup C
- Resources to be used in the review of requests
- Outreach to the nuclear data user and producer communities and feedback
- Maintenance of the request lists
- Website formats and contents
- Checklists of criteria to be considered in reviewing requests
- Time schedule for implementing new procedures
- Japanese experience in adapting existing HPRL to the needs of that country
- Discussion of what constitutes adequate “justification” for inclusion of requests
- Discussion of what constitutes “impact” in establishing the need for requested data
- Discussion of certain data areas, in particular medium energy data, as an example of how many requests can be eliminated and others re-defined or satisfied by nuclear modelling or new evaluations
- Discussion of measurement vs. evaluation in deciding how requested needs might be met in individual cases
- Review of procedures and frequency of reviews of list items
- Value of having a third list of satisfied requests to measure the utility of the request lists and to chart progress in improving nuclear data

In addition to addressing these topics, there were individual presentations by A. Koning (on his recent review of medium energy requests found in the present HPRL), by G. Manturov (on data needs for applied programs in Russia), by H. Takano (on a data sensitivity study conducted at JAERI), by T. Fukahori (on the steps taken by Japan to modify the existing NEA HPRL in order to accommodate data requirements in that country), and by G. Rimpault (on data needs for the French program and a user’s view of request lists and what their proper function ought to be).

The discussions were very informal and the topics were not addressed according to any rigid chronological order. The following sections aim to provide an overview of the various

issues discussed and to indicate some of the conclusions reached at the meeting according to the categories indicated above.

Discussions

Format and maintenance issues

Concept of dual lists

It was agreed by the participants that a single category of requests would not suffice. If there existed only a short "super" high priority request list, this would eliminate the possibility for documenting legitimate requests of lesser priority that should still be publicized to the nuclear science community. The possibility of a single list but inclusion of priority rankings (Priority 1, Priority 2, etc.) was considered; however, the majority of the attendees felt that such an approach had been tried in the past and had not proven to be very successful. Therefore, it was concluded that two lists would be established. One would be a truly high priority request list and the other a nuclear data request list (or general request list). All entries within a particular list would be treated as equally important.

List of satisfied requests

It was decided to establish and maintain a list of satisfied requests, to keep track of progress and as an advertising feature for the data request list project. Just how large this list should be allowed to grow and the format of the list itself are details that need to be worked out in the months ahead.

Organisation of Subgroup C

Subgroup C was charged with stewardship of the NEA nuclear data request list(s). It was generally agreed at the meeting that Subgroup C should be re-established and new members be appointed. Therefore, it was decided that there should be two permanent members of Subgroup C from each of the data projects. C. Nordborg was charged with contacting the project leaders to nominate candidates from their region. Every attempt will be made to insure coverage of the broadest possible range of experiences in the various nuclear data areas of concern to this community. Furthermore, Subgroup C will seek to contact technical consultants in areas not covered by the group member's areas of expertise for assistance in reviewing individual requests. Subgroup C will conduct its business mainly by e-mail and phone conversations, as required. However, it will hold one meeting every year in conjunction with the annual WPEC meeting to deal with issues that can be handled best by face-to-face interaction.

Outreach to the nuclear data user and producer communities, and feedback

The NEA Website for the nuclear data request lists will be an important component of community outreach. A contributed paper to the international conference ND-2004 in Santa Fe, New Mexico, will be prepared by members of the ad-hoc group, and later by Subgroup C, to advertise this new resource. Individual members of Subgroup C will contact nuclear scientists and engineers on an individual basis to acquaint them with the existence and value of the new

NEA nuclear data request lists. Furthermore, the NEA Website will have provisions for interactive feedback from users and producers of nuclear data. Subgroup C will review, on a regular basis, all comments received and respond to them or at least consider the merit of the offered comments and criticisms. There will be ongoing dialogue established between Subgroup C and the users and producers of data, especially concerning the high priority items.

Maintenance of the request lists

Maintenance of the request lists and Website will be the responsibility of the NEA Data Bank. However, it will be the responsibility of Subgroup C to insure the accuracy and the currency of its content. It is intended that the entire Website be reviewed periodically. This will probably occur on an annual basis.

Website formats and contents

Various aspects of this topic were discussed at the meeting, but it is anticipated that there will be continuous evolution based on experienced gained in the months and years ahead. The Website will be a "living" entity.

Review procedures for accepting and eliminating requests

Criteria for inclusion of requests

It was agreed that every item in the current HPRL would need to re-establish its justification, i.e., there would be no automatic carry over of requests from the present list. Some existing requests, which are considered unrealistic, will be removed from the list during the next few months. Other items will be transferred to the new lists, IF they meet the new criteria for inclusion.

A preliminary version of an information spreadsheet was developed at the meeting in order to establish certain basic criteria that must be met by every request. All requests must be well-posed, key parameters must be specified clearly, there must be a laboratory and individual contact associated with each request, justification and impact statements must be provided, etc. In addition, requests that are intended to be included in the high priority list must be thoroughly documented and results from sensitivity studies or studies that quantitatively demonstrate the existence of unacceptable discrepancies must be provided. The NEA request list Website will include provisions for links to documents, detailed justification and impact statements, etc.

Justification for inclusion of requests

There was considerable discussion about the issue of justification and far from unanimous agreement on the subject. In general terms, it was agreed that the information provided by the requesters to justify including their request in the high priority list, as opposed to the general nuclear data request list, should be quantitative and well documented. The practicality of requiring numerical data from sensitivity studies, or demonstrated effects of discrepant data, remains to be determined, but this will be the goal toward which the request list project will strive. It was generally agreed that all requests, and especially high priority ones,

should come from high profile current applied projects and that the substance of these request should always fall within the realm of feasibility. In other words, inclusion of those requests for which there is little chance of fulfilment should be avoided.

Impact of requested data

The justification needed for a request to be considered as high priority has not been entirely resolved as a consequence of this meeting. It must be discussed further in the months ahead. Generally speaking, for a request to have high priority, the case must be made that acquisition of the requested data will have significant impact in the areas of cost benefit, safety, reliability, etc. Whether it will be practical to require requesters to quantify the impact of the requested data a-priori remains to be seen but, again, it is an ideal toward which the request list project will strive.

Criteria for elimination of requests

As indicated above, certain existing requests will be eliminated early-on because they are deemed satisfied, frivolous, or no longer applicable. Other existing requests will be examined in the context of the newly established criteria and they will be retained (and reformatted) for inclusion in one of the two new lists. The ad-hoc group would carry out this work during the last few months of 2003 and the first quarter of 2004. It is unlikely that many existing requests will be able to meet the criteria for inclusion in the new high priority list without further work. However, authors of requests with the potential for inclusion in the high priority list will be contacted by the ad-hoc group and encouraged to provide the documentation and justification material required to meet the criteria for inclusion. If this material is not forthcoming then the existing requests will be eliminated or relegated to lower status in the ordinary request list.

Checklists of criteria to be considered in reviewing requests

During the next few weeks (or months) the ad-hoc group will finalise the criteria against which each request will be judged and this information will be posted on the Website. A clear checklist will be established in the form of an on-line submission form for requests. No request will be accepted by the Website and considered further unless it provides sufficient information to satisfy the online information-gathering algorithm. Furthermore, no request will be entered automatically into either of the two lists. Each request will be reviewed personally by members of Subgroup C (and outside technical consultants if necessary) before inclusion in either of these lists. Furthermore, interaction between Subgroup C and requesters is to be expected as part of the process of considering items to include in the list.

Frequency of reviews

There was unanimous agreement that requests and procedures associated with the data request list project should be reviewed periodically. However, there was no particular consensus as to what the review cycle should be. Most of the attendees felt that the high priority items should be reviewed at least once a year. The issue of review cycles will have to be addressed later. The outcome of this deliberation probably will depend upon the amount of effort that members of Subgroup C will be able to devote to this activity. It is clear that shortening the list will make it significantly easier to review the retained requests more frequently than is presently the case.

Resources to be used in reviewing requests

The NEA Data Bank will maintain a file of references and documents that can be used by Subgroup C in assessing the merit of requests. This information resource might include references to journal articles, reports on detailed studies, and a variety of other material that could be useful for this task.

Case history – medium energy data requests & measurement vs. modelling vs. evaluation

In advance of this meeting, A. Koning spent considerable time reviewing the existing medium energy requests and preparing comments on individual entries. Consequently, some time was devoted to reviewing his work, mainly for consideration as a model for the approach to be taken during the next few months by other members of the ad-hoc group in reviewing existing requests in the other application areas. It was during the discussion of Koning's work that the issue of measurement vs. modelling vs. evaluation was introduced. Koning correctly pointed out that many of the requests he encountered could probably be satisfied by nuclear model calculations, especially in situations where the model parameters had been previously "benchmarked" by comparison of calculated results with existing reliable data in the same mass and energy region, as well as reaction category.

Summary

- The current HPRL is too long and must be shortened by establishing more rigorous criteria for inclusion and retention of requests.
- Subgroup C will be established by including two members from each data project; it will assume the lead responsibility for stewardship of the list while the NEA Data Bank will maintain the list(s) and associated Website.
- A two-list system should be established with ordinary requests and high priority requests. The high priority requests will be distinguished by higher standards for justification and impact assessment.
- All existing requests will have to be reviewed before being accepted in one or the other of the new lists; many existing requests will be eliminated.
- The change from the existing setup to the new setup for the NEA request list(s) will take place between October 2003 and May 2004.
- Subgroup C will reach out to both the user and data provider communities to acquaint these communities with the new data request list procedures and to convince them of its benefits.
- Feedback will be sought from the user and provider communities and Subgroup C will be periodically review and if need be act upon the comments received.
- The ultimate goal is to establish and maintain a NEA data request list activity that is beneficial to both the data user and data provider communities.

Actions

The following actions are not listed in any particular order with respect to either priority or urgency. The responsible person(s) and suggested time frames for fulfilment of the indicated task are both indicated within each entry. Most of these actions should be fulfilled prior to the May 2004 WPEC meeting but certain others will be ongoing.

Action 1 (Nordborg/Smith)

Prepare an abstract for submission to ND-2004 that deals with the new NEA Nuclear Data Request List and High Priority Request List (HPRL). Circulate this abstract among the meeting participants (co-authors) for approval and then submit it to the LANL organising committee prior to the deadline on 15 December 2003.

Action 2 (All)

Suggest documents to be included in the reference list that will accompany the Nuclear Data Request List and High Priority Request List at the Website. Transmit these suggestions to the OECD/NEA Secretariat (Nordborg). This should be done prior to May 2004.

Action 3 (Koning/Fukahori)

Koning will review existing medium energy entries in the current HPRL and transmit his comments to Fukahori for consolidation in the revised version of HPRL that has been assembled in Japan. These comments should indicate requests that could be deleted or that have likely been satisfied. This task should be finished before the end of 2003.

Action 4 (Fukahori)

Reformat existing Japanese HPRL according to the new formats discussed in Paris and send this material to the OECD/NEA Secretariat (Nordborg) so that work on the new Website can proceed. This should be finished before the end of 2003.

Action 5 (Smith/Nordborg)

Prepare a draft of the minutes of the Paris HPRL meeting and circulate it among the attendees for comments. This should be accomplished before the end of October 2003.

Action 6 (All)

Review the draft minutes of the Paris HPRL meeting and transmit comments to OECD/NEA Secretariat (Nordborg) with a copy to Smith. This should be accomplished before the end of November 2003.

Action 7 (Smith/Nordborg)

Issue the final version of the minutes of the Paris HPRL meeting. This should be accomplished prior to onset of the Christmas holidays 2003.

Action 8 (OECD/NEA Secretariat)

Develop a new Website for the Nuclear Data Request List, High Priority Request List, and Satisfied Requests List based on decisions reached at Paris HPRL meeting and subsequent comments received by e-mail from attendees. This site will no doubt include some of the existing requests – suitably reformatted and augmented – but many of the current entries will either have been eliminated or identified as satisfied. It will also include a template for the requestors to use in submitting new requests, guideline information to aide in the preparation and review of new requests and review of existing requests, and a mechanism for collecting feedback on the request lists. The goal is to have this task accomplished by the May 2004 WPEC meeting.

Action 9 (Nordborg)

Contact all nuclear data project leaders to solicit nominees for two positions on Subgroup C from each region. The goal of this exercise will be to try to achieve as much expertise coverage as possible for the various nuclear data sub-disciplines as well as experimental and modelling/evaluation experience. Try to accomplish this before the end of 2003 so that Subgroup C staffing and selection of its leadership can be finalized before the May 2004 WPEC meeting.

Action 10 (All)

Review current HPRL and generate suggestions for immediate elimination of certain requests (as insufficiently substantiated and/or frivolous) or their relegation to the list of satisfied requests. Transmit these suggestions to Fukahori. The goal is to trim the existing list as much as possible before undertaking the work needed to reformat and/or augment the remaining requests so that they will achieve compliance with the new standards for inclusion. This work should be accomplished prior to the May 2004 WPEC meeting.

Action 11 (Fukahori)

Compile comments received from Paris HPRL meeting attendees on existing HPRL entries. This task will be ongoing during the next several months prior to the May 2004 WPEC meeting.

Action 12 (All)

Suggest potential candidates for inclusion in the new HPRL. This will be an on-going activity; however, the first round of candidates should be assembled prior to the May 2004 WPEC meeting.

Action 13 (McKnight)

Collect an example or examples to illustrate the sort of information that needs to be provided in order to justify inclusion of a data request in the new HPRL. It would be desirable to have this material available prior to the May 2004 WPEC meeting.

Action 14 (All)

Provide examples and suggestions for appropriate wording for guidelines and descriptive information to be included in the new Nuclear Data Request List Website (ref.: Excel-file discussed during the HPRL meeting in Paris). In order to facilitate Web development work by the OECD/NEA Secretariat, it would be desirable to transmit these suggestions to Paris (Nordborg) before the end of 2003.

Action 15 (All)

Submit any post-Paris-meeting thoughts that you may have concerning the various "columns" in the spreadsheet that was developed during this meeting. In particular, focus on the areas of "Impact" and "Justification", since there appear to be some unresolved issues concerning these criteria. Your views on these issues should be transmitted to the OECD/NEA Secretariat (Nordborg) before the end of 2003 to facilitate development of the new Website.

Action 16 (All)

Inform your colleagues that a new OECD/NEA Website is under development, and that it will include ordinary as well as high-priority requests in separate categories. Educate them as to the requirements for submission of requests in each category and encourage them to submit properly documented and substantiated requests to the OECD/NEA Secretariat (via the Website when it is available) for consideration by Subgroup C. Finally, try to convince your colleagues that this new resource will be of valuable to both users and providers of nuclear data. This should be an ongoing task.

Action 17 (Smith)

Contact Edward Cheng to obtain his opinion about the current requests for fusion and to help in eliminating certain requests and reformatting others to conform to the new NEA Nuclear Data Request List criteria.

Action 18 (McKnight)

Contact those individuals in the WPEC community who are involved with fission product nuclear data in order to eliminate certain requests and reformat others to conform to the new NEA Nuclear Data List criteria.