Enclosure 1 (1)

CHAIRMAN'S SUMMARY

C.L. Dunford
National Nuclear Data Center
Brookhaven National Laboratory

The first meeting of the United States Nuclear Data Program after its reorganization was held at Brookhaven National Laboratory, April 27-29, 1998. The meeting was attended by 33 people from 14 organizations. The meeting endorsed the organizational structure which presently consists of a Coordinating Committee, three Working Groups and one Task Force. Four members of the newly formed Steering Committee participated in the meeting.

The Reaction Data Working Group reviewed its activities in the following areas: nuclear astrophysics, radioactive ion beam target design, medical applications, and nuclear model code development. The Working Group also discussed plans to update and extend the energy range for nuclear reaction data standards, synergy with the Science-Based Stockpile Stewardship program funded by DOE/DP and the status of U.S. nuclear data measurements. The group also recommended that NNDC maintain an archive of nuclear model codes.

The Nuclear Structure and Decay Data Working Group concentrated on the backlog of technical and administrative issues which have accumulated since their last meeting two years ago. The items discussed are: decreased evaluation manpower, evaluation priorities, streamlined processing, and review of evaluations. A proposed solution to the Y2K problem in ENSDF was adopted. A review was held of new data types required for astrophysics applications and the necessary ENSDF-format changes which would be required. It was agreed that there would be network discussions before new "horizontal" evaluations are initiated to ensure that the results can be integrated into the existing data base.

The Dissemination Working Group reviewed the data dissemination activities of the U.S. Nuclear Data Program. The group concluded that no single dissemination medium would satisfy the broad spectrum of users. The lack of coordination and communication among those developing dissemination software was recognized. The Working Group chairman was charged with the responsibility of developing a plan to improve coordination and cooperation.

Coordinating Committee Summary

The Coordinating Committee reviewed the work of the first meeting of the U.S. Nuclear Data Program. The committee endorsed organizational structure developed at the March meeting of the Program's "Principal Investigators" at Lawrence Berkeley National Laboratory. The committee agreed to the following assignments, at least through the next meeting.

1)	Charles Dunford	(BNL)	Chairman of the Coordinating Committee
2)	Richard Helmer	(INEEL)	Chairman of the Nuclear Structure and Decay Data Working Group
3)	Mark Chadwick	(LANL)	Chairman of the Nuclear Reaction Working Group
4)	Eric Norman	(LBNL)	Chairman of the Data Dissemination Working Group

One Task Force on Nuclear Astrophysics Data was identified. It was formed prior to the meeting and is chaired by Michael Smith (ORNL).

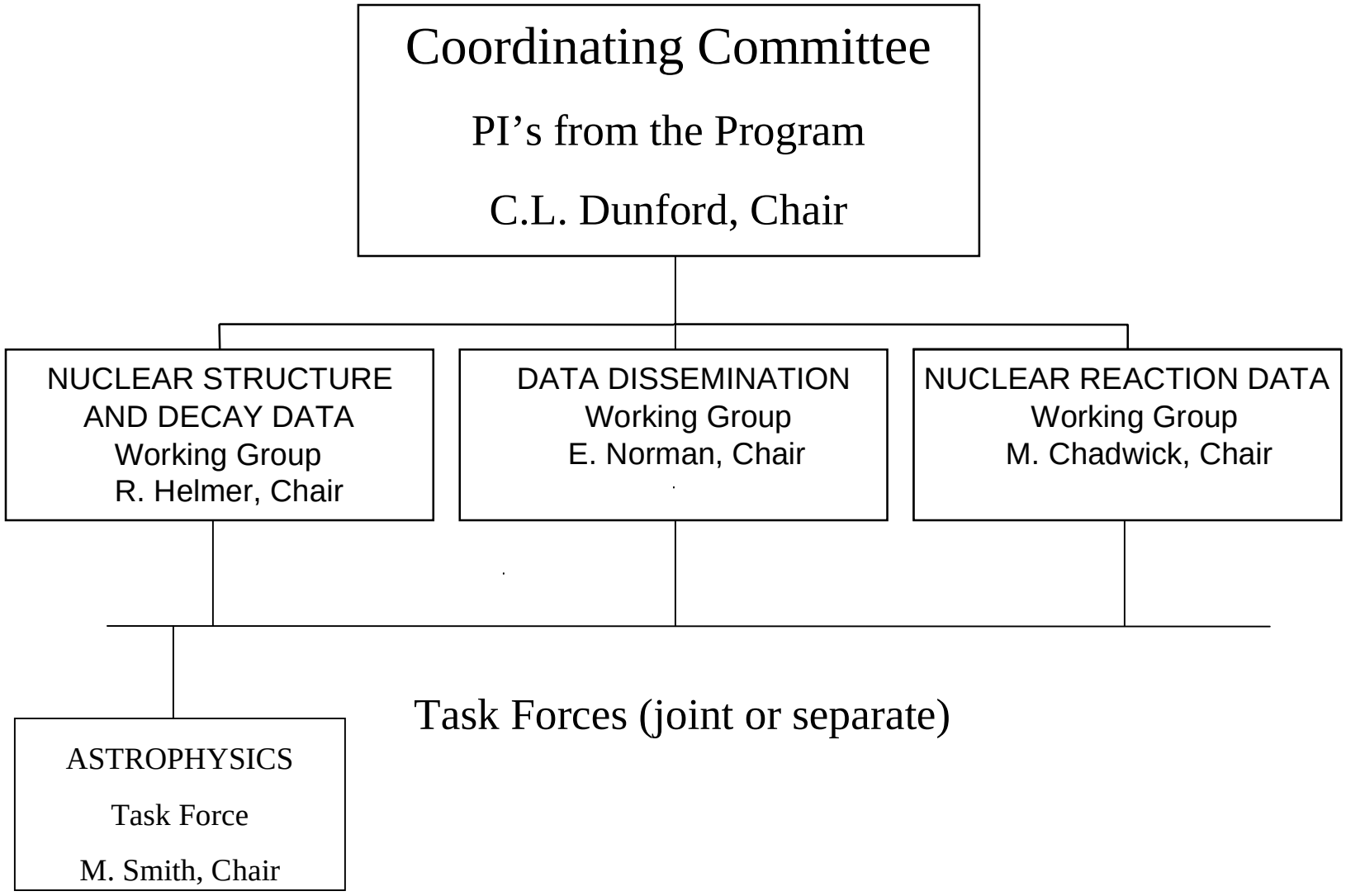
The committee endorsed the manner in which the meeting was conducted and felt that the meeting goals had been largely fulfilled. Future meetings of the USNDP will be held annually following the current format. The next meeting should be held in early April 1999 at Brookhaven National Laboratory. Working Groups and Task Forces will meet whenever necessary between annual program meetings as determined by their chairs.

Four of the six members of the USNDP Steering Committee participated in this meeting. They were Walter Henning, Chair (ANL), Mark Chadwick (ANL), Thomas Glasmacher (MSU), and Peter Parker (Yale). The participants welcomed the chance to interact with these Steering Committee members and urge that the Steering Committee be represented at future meetings. Two members of the USNDP Coordinating Committee, Charles Dunford and Eric Norman, will attend meetings of the Steering Committee.

The committee felt that proper planning is essential to the success of new undertakings in the work of the USNDP. They agreed that the kind of meeting between the potential user community and the USNDP professionals as exemplified by the recent San Jose meeting on nuclear data for astrophysics is the best way to plan such new ventures. In a similar vein, it was agreed that before initiating a new "horizontal" evaluation, a work plan will be submitted to the USNDP for review. The plan should state the scope of the effort, the resources required, and how the data would be integrated into the USNDP's master data bases.

The Data Dissemination Working Group took some initial steps toward integrating the data dissemination activities of the Program. These included the organization of access to program products through a common web page; the commitment to review existing dissemination activities and products; and the desire to implement cooperative projects between groups in the program. Much more work needs to be done to address the "duplication of work" issues raised by both the Paul/Parker Panel and the Steering Committee.

Nuclear Data Program Organization



Nuclear Data Program Meeting 1998
Brookhaven National Laboratory
April 27-29, 1998

AGENDA

DATE: Monday, April 27, 1998
LOCATION: Berkner Hall, Room B

TIME	
08:30	Opening Remarks by: **Dr. Robert A. Bari,** Chairman of the Department of Advanced Technology at BNL **Dr. Walter Henning,** Chairman USNDP Steering Committee, ANL **Dr. Charles L. Dunford,** Chairman of the Coordinating Committee Working Group Chairs
10:30	Reaction and Structure (in parallel)
12:30	Lunch Break
13:30	Reaction and Structure (in parallel)
17:30	Dinner Break
19:30	Reaction and Structure (in parallel)
22:00	End of Day (or until completion)

DATE: Tuesday, April 28, 1998
LOCATION: Berkner Hall, Room B

TIME	
09:00	Reports from Reaction and Structure Chairs
10:00	Dissemination
12:30	Lunch Break
13:30	Dissemination
17:30	Dinner Break
19:30	Dissemination
22:00	End of Day (or until completion)

DATE: Wednesday, April 29, 1998
LOCATION: Berkner Hall, Room B

TIME	
09:00	Coordinating Committee
12:00	Wrap Up and Closing

Detailed Agenda

Nuclear Reaction Data Working Group
Mark Chadwick (LANL) - Chair

10 minutes	1. Opening – Comments by the chair – Agenda revisions
20 minutes	2. Progress since the Golden, Colorado meeting
60 minutes	3. Resources for maintenance of the reaction data base(s) – People, skills, interests – Domestic and foreign collaborations
120 minutes	4. Basic Research needs and Working Group response – Astrophysics – Radioactive ion beam facilities – Medical – Heavy-ion beam data
30 minutes	5. Applied technology needs and Working Group response – Spallation neutron sources – Accelerator driven systems – Stockpile stewardship – Other
90 minutes	6. Evaluation methods and tools – Current activities – Future work
90 minutes	7. Nuclear reaction data – Standards – Measurement needs – Archiving experimental data, requirements and priorities – Archiving evaluated data in the ENDF system
45 minutes	8. Recommendations for future work – Division of responsibilities
45 minutes	9. Interaction with Dissemination Working Group – Reaction data dissemination needs
Total time allocated is 8.5 hours	

Nuclear Structure and Decay Data Working Group
Richard Helmer (INEEL) - Chair

10 minutes	1. Opening – Comments by the chair – Agenda revisions?
80 minutes	2. Brief center reports
90 minutes	3. Organization of evaluation activity – Priority determination – Improved currency – Endt and Van der Leun mass region – Agreed responsibilities
60 minutes	4. User needs and specialized evaluations – Decay data – Superdeformed bands – Nuclear moments – Astrophysics – Integration of results into the ENSDF data base
120 minutes	5. ENSDF formats and procedures – Logft and ICC – Ionized atoms – Averaging data – Year 2000 implications – Format changes – Processing and checking codes
15 minutes	6. Nuclear Science References
30 minutes	7. ENSDF data base – Need for an experimental data base – Relationship of specialized data bases to ENSDF
30 minutes	8. Preparation for Vienna meeting in December
45 minutes	9. Recommendations for future work
45 minutes	10. Interaction with Dissemination Working Group – Structure and decay data dissemination needs
Total time allocated is 8.75 hours.	

Nuclear Data Dissemination Working Group
Eric Norman (LBNL) - Chair

10 minutes	1. Opening – Comments by the chair – Agenda revisions?
20 minutes	2. Goals of Dissemination Working Group
150 minutes	3. Center Reports on Dissemination Activities and Usage
60 minutes	4. Dissemination Needs – Reactions Group – Structure & Decay Group
60 minutes	5. Dissemination Methods – CD-ROM – Internet
60 minutes	6. Method of Work within Dissemination Group
60 minutes	7. Coordination of Activities
60 minutes	8. Plan of Action
Total time allocated is 8 hours	

Nuclear Data Program Meeting 1998

ATTENDEES LIST

Name	Affiliation
Yurdanur A. Akovali	Oak Ridge National Laboratory
Agda Artna-Cohen	Oak Ridge National Laboratory
Coral M. Baglin	Lawrence Berkeley National Laboratory
Robert A. Bari	Brookhaven National Laboratory
Mulki R. Bhat	Brookhaven National Laboratory
Thomas W. Burrows	Brookhaven National Laboratory
Allan D. Carlson	National Institute of Standards & Technology
Mark B. Chadwick	Los Alamos National Laboratory
Frank Chu	Lawrence Berkeley National Laboratory
Charles L. Dunford	Brookhaven National Laboratory
Richard B. Firestone	Lawrence Berkeley National Laboratory
Thomas Glasmacher	Michigan State University
Steven M. Grimes	Ohio University
Robert C. Haight	Los Alamos National Laboratory
Gerald M. Hale	Los Alamos National Laboratory
Richard G. Helmer	Idaho National Engineering and Environmental Laboratory
Walter F. Henning	Argonne National Laboratory
John H. Kelley	Triangle Universities Nuclear Laboratory
Robert R. Kinsey	Brookhaven National Laboratory
Robert E. MacFarlane	Los Alamos National Laboratory
Victoria McLane	Brookhaven National Laboratory
Eric B. Norman	E.O. Lawrence Berkeley National Laboratory
Pavel Oblozinsky	International Atomic Energy Agency
Peter Parker	Yale University
Charles W. Reich	Idaho National Engineering and Environmental Laboratory
Balraj Singh	McMaster University
Donald L. Smith	Argonne National Laboratory
Michael S. Smith	Oak Ridge National Laboratory
Craig Stone	San Jose State University
David R. Tilley	North Carolina State University and TUNL
Jagdish K. Tuli	Brookhaven National Laboratory
Constance K. (Kalbach) Walker	Triangle Universities Nuclear Laboratory
David F. Winchell	Brookhaven National Laboratory

Minutes from Dissemination Working Group

U. S. Nuclear Data Program

April 28, 1998, Brookhaven National Laboratory

As was stated in the recent report of the Paul/Parker Panel,

" The mission of the U.S. Nuclear Data Program is to maintain the currency and viability of the nuclear structure and nuclear reaction data bases as a national resource, to respond to and address the evolving priorities and needs of its user communities, and to make this national resource available to the users of nuclear data in a straightforward and user-friendly manner."

Thus, the second day of the recent USNDP meeting at BNL was devoted to a discussion of nuclear data dissemination activities. This session was chaired by Rick Norman and was attended by essentially all of the participants in both the Nuclear Structure and Decay and Nuclear Reactions Working Groups.

The chairman briefly reviewed the variety of dissemination methods that have been and/or are currently being used by members of the USNDP in order to provide users access to nuclear data. These include hard-copy publications such as Nuclear Data Sheets, the Table of Isotopes, and specialized laboratory reports. CD-ROMs have also been used to distribute the Nuclear Science References database. Over the past several years, however, most of the nuclear data dissemination effort has been devoted toward internet-based techniques.

Reports on data dissemination activities were then given by representatives from seven institutions.

INEEL: Dick Helmer reported that a CD-ROM version of Russ Heath's gamma-ray catalog and spectra is being prepared and will be completed by the end of FY98.

ORNL: Michael Smith reported on the nuclear astrophysics and nuclear structure data dissemination activities at ORNL. The RADWARE software package is now available through ORNL, which provides researchers the ability to make nuclear level-scheme information easily available to the community prior to publication.

SJSU: Craig Stone reported on progress in the of development of the MacNuclide program. Version 2 is currently in beta testing.

TUNL: Ron Tilley described the work of the TUNL group in providing access to the nuclear structure data for A=3-21. This is done via hard-copy publication in the journal Nuclear Physics as well as via the World Wide Web.

BNL: Tom Burrows described the activities of the NNDC in publishing nuclide and A-chain data in Nuclear Data Sheets, collaboration for the production of the CD-ROM version of NSR, as well as for a variety of WWW-based methods to provide user access to the ENSDF, ENDF, CINDA, NSR, etc. databases.

LANL: Bob MacFarlane reported on the status of the T-2 Nuclear Information Service at LANL. ENDF-formatted reaction and decay data, astrophysics data, and a variety of basic educational materials on the field of nuclear data are available from LANL via the WWW.

LBNL: Rick Firestone described recent activities at LBNL. These involve hard-copy publications (8th edition of Table of Isotopes), CD-ROMs (collaboration on NSR, 1998 update to TOI), and a variety of WWW-based activities (Isotope Explorer, Nuclear Astrophysics data, etc.).

During and following the center reports, there was discussion over the issue of whether a single dissemination method (e.g. WWW) could satisfy the needs of all users of nuclear data. The consensus of opinion was that a single approach was not adequate, and that hard-copy, CD-ROM, and internet methods continue to be useful tools to provide data to our users.

From the center reports, it is clear that many very nice and widely-used tools have been developed to provide users with access to nuclear data. Although it is difficult to quantify the usage very precisely, it is clear that there are thousands of downloads per month of nuclear data from the various USNDP websites.

However, it was also recognized that there has not been enough communication and coordination within the USNDP regarding this work. Thus, there has been some duplication of effort. In addition, it may not be apparent to a user that the information he or she retrieves is the product of the work of the whole USNDP. Thus a series of actions were initiated in order to address these issues.

1. A small group headed by Rick Norman will plan and review future dissemination activities.
″

2. Under the leadership of Tom Burrows, a unified USNDP website will be developed.

3. Frank Chu will lead a collaboration on the development of dissemination software.

4. Craig Stone will lead an effort to improve database connectivity.

The Nuclear Reactions Working Group came up with the following list of dissemination issues or needs:

1. Cross section data related to the production of radioactive beams should be archived and distributed on the World Wide Web.

2. Computer codes used for calculating nuclear reaction cross sections should be archived and distributed on World Wide Web.

3. The CSISRS database should be made available to users on the World Wide Web.

These items will become future activities for the Dissemination Working Group.

Minutes of the Nuclear Reaction Data Working Group (NRDWG)

Brookhaven National Laboratory
April 27, 1998

Chair: Mark Chadwick, LANL

Present: Michael Smith (ORNL), Connie Kalbach (Duke University), Allan Carlson (NIST), Robert MacFarlane (LANL), Robert Haight (LANL), Steven Grimes (Ohio University), Said Mughabghab (BNL), Eric Norman (LBNL), Peter Parker (Yale), Pavel Oblozinsky (IAEA), Vicki McLane (BNL), Mulki Bhat (BNL), Charles Dunford (BNL), Don Smith (ANL), Gerry Hale (LANL), Walter Henning (ANL), Mark Chadwick (LANL), Craig Stone (San Jose State University).

Summary

Progress reports were presented by each participant describing their recent work as part of DOE-ER's Nuclear Data Program. Following this, we had a discussion to determine the resources available within the NRDWG - that is, supported FTEs, collaborative opportunities with other researchers (U.S. and foreign), and "leveraged" support through overlapping interests with nuclear data work funded by other programs within the U.S. (e.g., DOE-Defense Programs). The major part of the meeting was devoted to discussing the needs of the various user-communities of nuclear reaction data: astrophysics; radioactive-ion beams; medical applications (radiotherapy and medical isotopes), as well as new spallation neutron source and accelerator-driven facilities, and users of standards data. The need to ensure that user communities, whether basic or applied, collaborate in a serious way by providing their own resources (time/funding) to collaborative efforts to develop nuclear reaction data was stressed. There was a consensus for the need to develop a WWW-accessible archive of nuclear reaction modeling codes that have played a key role in providing evaluated nuclear reaction data for a variety of user communities. Such statistical and preequilibrium modeling codes will be useful for users who wish to run these codes themselves for obtaining cross section predictions, and will also be useful for those groups developing their own reaction codes who can make use of well-documented and archived subroutines. Input to the Dissemination Working Group was provided, where we discussed forthcoming dissemination needs for providing WWW-access to: nuclear modeling codes and RIB-relevant data. (Issues specifically relevant to astrophysical reaction data dissemination are being worked out by the Astrophysics Task Force with the Dissemination Working Group). The usefulness of international collaborations, often organized under the auspices of the IAEA and the NEA, was discussed. These collaborations enable U.S. researchers to stay abreast of important developments in the wider international nuclear data communities. Large amounts of experimental and evaluated reaction data obtained from foreign data program efforts are obtained at the NNDC for use by U.S. data users. We noted that it is critical that the NNDC continue its important role in compiling measured cross sections (particularly charged-particle induced reaction data), references to publications of data, and its maintenance of the ENDF databases.

Priorities for work in the Reaction Data Working Group in the coming months:

Astrophysical Data

Michael Smith summarized some of the plans that emerged from the recent San Jose meeting, where a consensus was obtained for initiating a new coordinated effort to compile, evaluate, calculate, and disseminate data for astrophysical needs. The particular expertise that workers at each laboratory/university are able to contribute was summarized. Plans to have an outside steering committee to help guide the Astrophysical Task Force were also described.

Some of the particular expertise that can be provided by the Nuclear Data Program include:

- ANL: H and He -burning reactions, emphasis in the A=30-50 region, for understanding stellar explosions.
- BNL : Archiving astrophysical data.
- LANL: n, charged-particle capture reactions with R-matrix analyses, masses and decay properties, levels for A<20, Hauser-Feshbach calculations.
- LBNL: Setup and maintenance of WWW site, evaluation and compilation of structure and decay data.
- LLNL: Calculation of rates from cross sections, development and use of new statistical model code for Hauser-Feshbach calculations.
- ORNL: Evaluation of reaction rates for radioactive isotopes for explosive nucleosynthesis, H and He burning cross sections.
- TUNL: Evaluating S-factors for light nuclei.
- UC Santa Cruz: Hauser-Feshbach calculations, methods to represent reaction rates.

A formal proposal from the Astrophysical Task Force to the DOE will be submitted this summer.

Radioactive Ion Beam Data

To date, the RIB Task Force has interacted with researchers at ORNL, primarily Jerry Garrett. At his request, nuclear reaction cross sections for producing various proton-rich

products through (p,xn) reactions have been evaluated, through nuclear model calculations benchmarked to measurements where they exist. Additionally, a compilation of nuclear properties (masses, separation energies, decay properties..) relevant to RIB physics has been completed and published by Moller et al.

In general, a wide-ranging effort on RIB target design is going on around the world, and the NRDWG should keep abreast of these developments and provide data support where necessary. Some of the RIB production-target issues are being coordinated by the OECD MagaScience Forum (Rick Casten is on their working group). The NRDWG could play a stronger role here. In the U.S. proposals for a new ISOL facility are expected to be due by May 1999.

Future needs from this user-community include:

1. Additional data for RIB target design. Chadwick will be meeting Garrett in early May to discuss additional needs at ORNL.

2. Contact should also be made with researchers at ANL, such as Jerry Nolen.

3. Codes such as LAHET, MCNP and HETC are used in RIB target/facility design studies. The ENDF databases are used by these codes. New improved data to higher energies (150 MeV) developed at Los Alamos under DOE-DP funds for accelerator-driven technologies could be used for more accurate predictions of certain important quantities, such as radionuclide production, activation, and shielding requirements.

4. An extension of the work by Moller et al., to include first-forbidden beta decay properties will be important for RIB-and-astrophysics; many of the ingredients needed for such a set of calculations, such as wavefunctions and Q-values, are already in place.

5. A new extensive database of radionuclide production cross sections for incident protons and incident neutrons, on a wide range of target nuclei (over 600 isotopes), should be made easily WWW-accessible for RIB target-design users. If stored in the ENDF format, then graphical and processing codes that exist at the NNDC can be used to access and view these data.

Medical Application Needs for Data

This is another area selected by the OECD MagaScience forum as an area of emphasis. It was also highlighted in the last NSAC Report.

Workers in the NRDWG have already interacted with users in the medical physics community to provide data of importance in proton and neutron radiotherapy. In addition to nuclear model calculations and evaluations of data needed for radiation transport simulations of particle beam therapy, developed in collaboration with medical physicists for the International Commission on

Radiation Units, other work has involved: studies of neutron sources from accelerated-protons on Be for boron-neutron-capture therapy; use of measured charged-particle production cross sections to infer kerma coefficients for neutron energy deposition; and use of the NJOY code to determine neutron heating from ENDF evaluations.

A future priority is the development of photonuclear data for studies of photon therapy, particularly for energies up to 25 MeV, needed for calculations of absorbed dose in the body, and for radiation protection needs because of the photoneutrons produced. Users in the medical community are actively seeking collaborations in this area and have committed to providing a graduate student from MIT to collaborate on developing the required data.

Photonuclear data are also of importance in astrophysics, as well as in certain proposals to make medical isotopes. Also, this is a leveraged area since DOE-DP is partly supporting the development of such data for accelerator-shielding needs. In addition to work at Los Alamos, an experimental data compilation at Livermore has been developed, and BNL also has archived much of the measured data that will be useful in guiding the nuclear model calculations.

Nuclear Reaction Modeling Codes

There was a consensus for the need to develop a WWW-accessible maintained archive of statistical nuclear reaction modeling codes, and a Task Force has been established for this purpose.

Nuclear model codes play a key role in the evaluation of data for a wide variety of users. They should be maintained and enhanced as new theory developments are made, and continually benchmarked to existing measured data.

Some of the motivations for archiving such codes are:

1. There are a number of efforts to develop new reaction modeling codes, e.g., at LLNL for astrophysics Hauser-Feshbach calculations, which will benefit from such a resource.

2. Codes get lost if they aren't archived. It is an appropriate time for Kalbach's PRECO preequilibrium modeling code to be archived for ease of access and use. HMS-ALICE, a widely-used reaction modeling code, needs to be archived now that Marshall Blann has retired. Codes maintained by labs, such as GNASH at LANL, are more likely to survive in the long run, whereas "private" codes die.

3. The IAEA has recently published a library of fundamental parameters needed in statistical model calculations (e.g., level densities, optical models..), known as the Reference Input Parameter Library (RIPL). An archived set of codes that utilize these data would be a valuable complement to this IAEA compilation.

4. Many people would like to have easy access to download and run these codes themselves. We should make this possible and provide the necessary education for outside users to do this.

   We will work with BNL and the dissemination committee to establish a plan for this.

Archiving of Experimental Reaction Cross Section Data at the NNDC

Vicki McLane described how large amounts of measured reaction cross section data are being provided to the NNDC by foreign nuclear data workers through bilateral agreements between the various international Data Centers. This is extremely important and useful for the USA - experimental nuclear physics measurements must by archived, and in addition, some of the data are obtained from countries of the former Soviet Union which were previously unavailable in the West. As part of these same international collaboration agreements, McLane is providing NNDC databases, and retrieval software, to the foreign Data Centers.

Mulki Bhat described his work to generate support for archiving heavy-ion reaction data at the NNDC. Some "trial" compilations of AGS data have been performed.

Additionally, Walter Henning encouraged the NNDC to pursue the possibility of helping to archive future data from CEBAF, and offered to discuss this with researchers at CEBAF.

Nuclear Standards Data

Nuclear standards data are widely used by experimentalists when measuring neutron cross sections to determine the neutron fluence. The cross section standards within the ENDF/B-VI library are adopted internationally and play a fundamental role in other ENDF/B-VI evaluations which were developed to be consistent with the standards. However, recent experimental data pertaining to some of the cross section standards has resulted in a need to update and revise them: (1) The H(n,n) elastic scattering cross section above 90 MeV, and at back angles, is inconsistent with new measurements from Uppsala University and PSI by up to 10%. Also, there are international concerns about this standard in the 10-15 MeV region -- Preliminary results at 10 MeV of a LANL-NIST-Ohio U. collaboration deviate from the ENDF/B-VI evaluation; (2) The 238U and 235U neutron fission cross sections are inconsistent with new high-accuracy data from Los Alamos in the 15-20 MeV region; (3) Several new measurements have improved the 10B(n,alpha) database, which caused significant problems in the ENDF/B-VI standards evaluation process.

Allan Carlson discussed possible ways that the standards might be updated by following the general procedures used in the ENDF/B-VI evaluation, within an international collaborative effort. Insufficient resources are available to proceed as a solely U.S. effort, though Carlson and Hale would play key roles in a future effort. Other researchers in Japan and in Europe are interested in the collaboration. Carlson will explore possibilities of coordinating this work through either the NEA

(as part of the Working Party on Evaluation Cooperation), or the IAEA. The subject will also be discussed in detail at the October CSEWG meeting.

Synergy with DOE-Defense-Programs-Supported Data Evaluation and Other Applications

Work is being supported at Los Alamos and Livermore to evaluate nuclear reaction data for Science-Based Stockpile Stewardship (SBSS) needs and for the Accelerator-Production of Tritium (APT) program. These data are being archived within the ENDF system at the NNDC, and since in many cases the data have a wider use than in just Defense Programs, they will be a useful resource for the wider nuclear physics and nuclear technology communities. For example, researchers designing the new Spallation Neutron Source at ORNL have sought access to the new high-energy data for design studies of the mercury spallation target. Likewise, much of these same data are useful for RIB target design, for medical applications involving external beam radiotherapy and accelerator-based transmutation of waste (ATW) proposals that are currently under study in Europe, Japan, and the USA.

New U.S. Experimental Reaction Measurements

Updates of recent U.S. measurements at Los Alamos were provided by Robert Haight and Steven Grimes including: (n,x gamma) measurements using the GEANIE detector at the Weapons Neutron Research facility, for nuclear reaction and nuclear structure physics studies; a comprehensive suite of neutron total cross section measurements from 6 - 600 MeV for over 35 target elements; (n,charged-particle) reactions for a range of targets from Los Alamos. These data will be archived at the NNDC. Steve Grimes also described ongoing experimental work at Ohio University, including n-p scattering measurements and neutron source characterizations.

The Los Alamos charged-particle emission data are used to infer nuclear level densities for excitations up to about 20 MeV, and are thus of importance to nuclear model calculations that depend sensitively on level densities. Said Mughabghab presented an interesting talk on the role of the spin cut-off parameter in inferring nuclear level densities from resonance information, and related uncertainties in the level density parameter to model calculations of neutron production in nuclear reactions.

Key Input for the Data-Dissemination Committee Meeting:

1. We have a new RIB target production-cross-section database that we would like to see on the WWW.

2. A new resource for archived nuclear modeling codes is needed. This would be maintained by the NNDC, and would allow a user to download the codes as well as documentation guiding their use.

3. Excellent recent progress has been made by the NNDC in WWW access to manuals, ENDF, etc. A next priority is WWW access to the experimental data in the CSISRS database - the NNDC expects to have this available shortly.

4. A new home page is needed to reflect the existing nature of the Nuclear Data Program and the Nuclear Reaction Data Working Group. This might also include a set of examples to illustrate the various potential uses of nuclear reaction data, and where a user would look to find out more about data resources available for each subject area.

Attachment: A selection of viewgraphs from the talks are attached to the minutes.

Minutes of Meeting of Working Group on Nuclear Structure and Decay Data of the

U. S. Nuclear Data Program
April 27, 1998, Brookhaven National Laboratory

Contents

The Working Group on Nuclear Structure and Decay Data of the newly reorganized U. S. Nuclear Data Program met on April 27, 1998 at Brookhaven National Laboratory. The meeting was chaired by Richard Helmer. The agenda, as amended at the meeting is Attachment 1, included oral and written reports by each Center doing structure or decay data evaluations and about twenty items which had been submitted by the various evaluators in the United States and Canada. The persons attending this meeting include those in Attachment 2. The written versions of the Center reports are in Attachment 3.

The agenda items that were discussed are given in Attachment 4 and are numbered 5-17, 19, 21-23. As circulated before the meeting, these items were made up of a Proposal, a Purpose, and a Discussion; these Discussions have been deleted to save space. A summary of the results of the discussions at the meeting are given below.

General comments

The meetings of the former U. S. Nuclear Data Network usually consisted of two parts. One was a small group called the Formats and Proceedures Subcommittee that discussed detailed items related to the data as it is stored in the Evaluated Nuclear Structure Data File (ENSDF) and the second was a Network meeting of including all of the U. S. and Canadian evaluators as well as the ENSDF system management people, involving broader policy issues. This meeting of the Working Group included both functions. The meeting lasted about eight hours and this constraint meant that some broader issues were discussed only in a narrow context, rather than a context which would have required more time.

This meeting progressed quite well and all attendees were interested in having a cooperative and productive meeting.

The decreased level of manpower available for evaluations of A-cahins and nuclides was commented on at several points, but was not discussed as a specific item. The Chair indicated he would collect some data on this matter.

Specific agenda items

It was agreed that the National Nuclear Data Center, NNDC, will continue to prepare lists of priority A-chains and priority nuclides for the guidance of evaluators in deciding on the order of their evaluation efforts (item #5). There was discussion of how the priorities are set, especially as to the influence of subject areas (e.g., astrophysics and high-spin data) as against the number of new papers with experimental data. It is assumed that the criteria for setting priorities may develop over the next year.

In the past there were problems with the long times that it took to get reviews done for the A-chains. To determine whether this is still a problem, NNDC provided a tally, Attachment 5, of the review times taken by the reviewer (item #6). It was pointed out that these times do not count the delay caused in several cases by the retirement of the person who originally was going to do the review. It is clear from the tally that the review time is not a general problem now. With the retirement of Murray Martin, most reviews will be less extensive as described in Nndc policy statements on reviews; therefore, it is necessary that the evaluator take full responsibility for the accurate entry of all numbers from the literature.

Several details related to the ENSDF processing codes (item #9) were discussed. (a) For the code LOGFT (which computes log *ft* and related values) , the Lawrence Berkeley National Laboratory, LBNL, group agreed to supply the coding they are using to compute the log *ft* values for unique 3rd and 4th forbidden transitions, NNDC will have it reviewed by John Millener, a theorist, and it will be added to LOGFT. (b) For RADLST (which computes atomic data quantities from the nuclear data), NNDC will supply to all evaluators a more modern set of atomic data, from Eckart Schönfeld of Physikalish-Technische Bundesanstalt, PTB, in Germany. The RADLST code will remain the same; it is just run with the newer atomic data. (c) There are some PC codes that are not as up-to-date as the VAX versions; NNDC plans to supply new PC versions in the near future. They will be made available electronically rather than via disk, except where a disk is necessary. (d) Changes in ENSDF by NNDC to accommodate the year 2000 and beyond were authorized. (e) The need for improvements in the printing of complex level schemes, including those of high-spin data, was discussed and NNDC will explore several possible improvements.

Three items related to analysis methods were discussed, but not adopted; these were (1) use of code to provide interpolated internal-conversion coefficients from Hager and Seltzer tables, Rősel et al., tables, and Band tables (item #13); (2) use of a code to provide the weighted average of a group of values by the Limitation of Relative Statistical Weight (LRSW) method (item #15); and (3) estimation of the most probable β^- or EC+β^+ intensity for branches whose characteristics known but intensity is not otherwise determined from new log *ft* systematics by B. Singh (item #14). (1) In the next few years there may be one or two new sets of theoretical internal-conversion coefficients calculated, so any change in the current Network policy of using the Hager and Seltzer tables was deferred. New calculations may be done by S. Raman, Oak Ridge National Laboratory (ORNL) and by a Russian-French group. The need to verify the quality of any new set of internal-conversion coefficients and the associated interpolation scheme was discussed. LBNL is to contact S. Raman about his efforts and to indicate to him what is needed if

the results are to be useful to the Network. (2) An LRSW average code may be circulated later so that evaluators can become familiar with it. (3) Since log *ft* distributions are always skewed by the inability to observe very weak branches, there is a technical question about the proper use of such systematics as well as the possibility that the distributions are so wide that the results would not be useful.

Three items that would involve the changing of some ENSDF formats were discussed. The first involved a method to store data for ionized atoms when they differ from the data for neutral atoms (item #17). It was agreed that the needed additions would be made. These changes are the first step in accommodating structure data for the astrophysics community since they will deal with highly ionized atoms. The suggested format modifications were discussed and a revised format will be circulated for comments before the ENSDF file format is modified. The first data to be entered into the file may be for the decays of ^{188}Re and ^{163}Dy; the later neutral atom is stable, but the fully stripped atom decays by β^-emission.

The two other proposals for changing the ENSDF formats involved storing additional quantities related to converting the stored γ-ray intensities to γ rays per 100 spontaneous fissions (items #10 and #22) and converting measured γ-ray emission rates to the number of atoms in a sample (item #23). It was suggested for item #22 and agreed for item #23 that these situations should be handled by having separate files available containing the spontaneous fission yields, the thermal-neutron-capture cross sections, the Westcott g-factors, the isotopic abundances, etc. These data are not of the type considered by the ENSDF evaluators and they would be much easier to up-date or modify for special situations (e.g., abundances which vary between geographic locations), if they are separate from ENSDF. The quality of the spontaneous fission yields was questioned and needs discussion.

The advisability of adding flags to the entries in ENSDF to indicate whether a reference has been used in ENSDF was discussed (item #11). The difficulties of imp[lementing this and its usefulness were discussed. Rather than this, it was suggested that there be added character-strings on which searches can be made to look for new papers in a particular subject area and the NNDC will explore the ideas discussed. .

A presentation was made concerning the types of data that the astrophysics community needs that fit into the categories in ENSDF (item #7). Since ENSDF is a file for measured data, or at least for atoms that are observed, the new data in this field may be quite limited. The atoms of interest will often be ionized and, therefore, will be studied in stripped beams. The first modifications of ENSDF to handle these data have been agreed to (see item #17 discussed above). The Chair will continue this dialogue with the new astrophysics group.

The data needs of the high-spin community were also discussed (item #8) by the evaluators present. This need appears to be primarily for a web-site where the experimenter can post her/his level scheme results before publication. It was reported that ORNL is developing such a web site. The chair will ascertain the details of the plans for this web site in order to determine if there are

needs, in addition to the regular need to evaluate the published data and get it into ENSDF.

The complexity of the incorporation of horizontal evaluations into ENSDF and their value for ENSDF were discussed. The specific proposal suggested that all horizontal evaluation results be given to the responsible A-chain evaluator to approve before entry into ENSDF, if such an evaluator in available and willing (item #12). The lack of a definite A-chain evaluator, the need to submit the whole nuclide as minimum unit and resolving related data in related nuclides, the possibility of putting horizontal evaluations in separate files, and the difference in evaluation procedures were all discussed. It was suggested that all horizontal evaluations done by ENSDF evaluators be approved by the Network before they are initiated; this has been done in some cases and not in others. The question of whether horizontal evaluations reduce the effort invested in A-chain and nuclide evaluations was raised. A web bulletin board where evaluators post their current activities was suggeted to reduce the cases where two evaluators are working on the same nuclide at the same time, especially in this time of a manpower shortage. These issues were not resolved, but the Chair indicated he would gather some information on present and future horizontal evaluations and the related manpower.

The existing horizontal evaluations that are being carried out by the people who are evaluators included:

decay data for selected nuclides (coordinated by R. G. Helmer, and including six non-network evaluators).
super-deformed band data (carried out by B. Singh and R. B. Firestone).
new nuclides (carried out by R. B. Firestone and including one non-network person)
α-decay data of even-even nuclei with no γ decay (carried out by Y. Akovali)

The minutes were prepared by R. G. Helmer, Working Group Chair, in part, from notes provided by C. Baglin and C. W. Reich.

Agenda for Working Group
on
Nuclear Structure and Decay Data Evaluations

Monday, 27 April 1998 at NNDC, BNL

Sessions

Morning	10:30 - 12:30
Afternoon	13:30 - 17:30
Evening	19:30 - 22:00

There may be a joint meeting on astrophysics data during part of this time.

Morning Session

Comments by Chair

Agenda revisions

Center reports (10 minutes each)
- NNDC activities of whole network
- TUNL
- ORNL
- NIST
- McMaster
- LBNL
- INEEL
- NNDC as evaluation group

Evaluation items
- priority list (item #5, NNDC)
- review times and procedures (item #6)
- enter spontaneous fission data as a priority (#10)

Afternoon session

Analysis codes
- changes to LOGFT & RADLST (#9a,b INEEL)
- PC versions of codes (#9d)
- ENSDF output of absolute γ intensities (#9c, INEEL)
- improved plots (#9f)
- internal-conversion coefficients (#13, INEEL)

ENSDF formats

year 2000 for ENSDF (#9e, NNDC)
ionized atoms data sets (#17, McMaster)
spontaneous fission format additions (#22, LBNL)
(n,γ) format additions (#23, LBNL)

Nuclear Structure References
added flags for indicating use in ENSDF (#11, LBNL)

Evaluation techniques
new log *ft* systematics (#14, McMaster)
averaging methods (#15, INEEL/LBNL)
do only adopted data sets (#16)

Evening session will begin during or before the next group of items

Horizontal evaluations & compilations
data needs of astrophysics community (#7)
data needs for high-spin community (#8)
incorporation of horizontal evaluations in ENSDF (#12, INEEL)
new nuclides (#21, LBNL)

General topics
advice on attendance at international NSDD meeting (#18, INEEL)
authorize Chair to work between meetings (#19, INEEL)
advertize for suggestions (#20, INEEL)
items to be taken to the international NSDD meeting (no #)

Other
as needed ---

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: #5

Proposal:

NNDC is asked to continue to provide lists of priority A-chains and priority nuclides.

Purpose:

To provide a continuing method of informing evaluators about the status of those A-chains and nuclides within their area of responsibility. And, to reduce the number of new papers that have to be evaluated after the review is done.

Discussion:

The evaluators should suggest improvements in the way the priority cases are identified.

Proposal from Richard Helmer.

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: #6

Proposal:

All evaluators in this Working Group should advise the Working Group Chair if they agree that they will attempt to carry out any A-chain or similar large review within two months of the date they receive the material, and carry out any nuclide review or similar small review within three weeks. The agreement on the part of the evaluator assumes that the NNDC would send the material to the evaluator only after she/he has agreed to do the review and to the schedule.

Purpose:

To obtain the acknowledgement that reviews should not inordinately delay the publication of evaluations.

Discussion:

None.

Proposal from Richard Helmer.

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: #7

Proposal:

Request that the Coordinating Committee attempt to determine if there are unmet needs of the Astrophysics Community that lie within the current domain of ENSDF, that is, measured data for the specified quantities.

If the Community needs lie outside this domain, would this Community be well served by a file of computed half-lives and Q values within the NNDC, or if such a file would be useful, should it continue to be developed elsewhere?

Purpose:

To ascertain the unmet needs.

Discussion:

None.

Proposal from Richard Helmer.

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: #8

Proposal:

Request that the Coordinating Committee attempt to determine if the "High-Spin Community" wants this Data Network to establish a file of compiled, unevaluated high-spin data in the ENSDF format.

Purpose:

To respond to user community needs if they are well-defined, generally agreed to, and compatible with subsequent data entry into ENSDF.

Discussion:

This Working Group needs to know if the High-Spin Community wants such a file, rather than using their existing files. Would this user Community need to rewrite their calculational codes to use ENSDF data sets, and is this acceptable? Does the desired data already exist in High-Spin Community files? If so, can the user Community provide computer codes to translate their current files into ENSDF data sets?

Proposal from Richard Helmer.

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: #9

Proposal:

Upgrade ENSDF processing and checking codes possibly including:

- Extend the code LOGFT to provide correct results for unique 3rd and 4th forbidden beta decays.
- Redistribute RADLST with up-to-date atomic data.
- Extend the output obtained when extracting decay data from ENSDF to give the absolute gamma-ray intensities and the associated uncertainties.
- Update any PC processing codes that are not as advanced as the VAX codes.
- Make changes in ENSDF that are needed for the year 2000. This involves converting to 8-character keynumbers on Q and ID records. On ID records, 'DATE' changes from YYMMDD to YYYYMM, eliminate 'PUB' field, and expand 'DSREF' to 35 characters. Also, reference data set and 'R' records will be eliminated.
- Improve the plotting of bands and complex level schemes. Goals might be to eliminate cases where the energy of the level at which a gamma terminates is not clear due to the complexity of the scheme and to show high-spin data primarily in the bands.

Purpose:

To improve the evaluation methodology and the usefulness of the data provided the user.

Discussion:

The unique beta decays mentioned do occur, so the correct values should be available.

Currently the extraction of decay data from the ENSDF file give the gamma-ray intensities as they are in ENSDF, which is often relative values that must be multiplied by a scaling factor. For decays with a large number of gamma rays, a lot of hand calculation must be done in order to get the absolute intensities.

Proposal from Richard Helmer in response to several suggestions.

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: #10

Proposal:

Data in neutron-rich nuclei from recent spontaneous fission measurements be treated as a special sub-topic of high-spin data and compiled or evaluated promptly.

Discussion:

The application of large detector arrays to the investigation of prompt gamma rays emitted in the spontaneous fission of ^{252}Cf and ^{248}Cm is yielding a rapidly growing body of nuclear structure data on neutron-rich nuclei in the 90-160 mass range. Over the last five years (1993-1997), the two main collaborations in the field published about 50 papers, identifying and assigning gamma transitions in and elucidating level schemes of, over 70 nuclei, ranging from strontium to samarium. The analysis of a more recent experiment done at Gammasphere with a thin ^{252}Cf source by University of Rochester and collaborators is beginning to generate additional data. Prompt gamma de-excitation of nascent fission fragments samples mainly the yrast level sequence up to spins of 20. The data can therefore be viewed as an extension of high spin data to the neutron excess region, which is not accessible by conventional high spin accelerator experiments.

Only a relatively small fraction of these data has so far been incorporated in ENSDF, and progress is quite slow, relative to the rate at which the data are being generated and published. In the normal course of events it will take many years till all the relevant mass chains come up for re-evaluation. Since this particular body of data represents a substantial extension of available nuclear structure data in the neutron-rich domain (and may be of practical significance to the nuclear power community), its inclusion in ENSDF should be expedited.

Proposal from Jacob Gilat, LBNL

Nuclear Structure and Decay Data Working Group
U. S. Nuclear Data Network, April 27, 1998

Item: #11

Proposal:

Add to NSR database, flags to indicate the "importance" of a paper and its status in relation to ENSDF.

Purpose:

To provide currency by means of NSR to compensate for the lack of manpower to keep ENSDF current.

Discussion:

A frequent criticism leveled against the nuclear data program is the long time lag between the publication of new data and their evaluation and inclusion in the evaluated data files. Given the large amount and increasing complexity of the data on the one hand, and the limited resources for evaluation on the other, the chance of a major improvement of the timeliness of the evaluation process in the foreseeable future is quite low. Different ways to alleviate this situation have been proposed: creating and disseminating an interim file of compiled (but not evaluated) data, selective priority evaluation of partial data sets of special interest to user communities, 'horizontal evaluation' and other variations on the theme. A major shortcoming of these proposed approaches is that their implementation entails a further dilution of available resources, leading to an even longer time lag and eventual impairment of the quality of the end product. The resulting status quo leaves the user in the unsatisfactory position of having to scan a rather large number of Recent References, to evaluate the validity of the data they contain and to assess their importance to his own project.

To partially alleviate the problem, I propose to make more efficient and effective use of the human resources devoted to the generation and maintenance of the NSR database. Instead of operating it as an essentially independent and separate effort, the idea is to integrate and share its resources with the rest of the program. Since highly qualified professional manpower is already being used to scan the literature and enter it in the NSR database, it shouldn't be difficult to generate for each paper a flag or a series of flags, indicating the importance and possible impact of the paper. Such flags, generated as an integral part of the process, would be based on agreed criteria developed by the network . One flag could indicate the "added value" figure of merit, i.e. the fraction of new data added or substantially modified by the paper relative to ENSDF. The network could also use the same figure of merit to assign evaluation priorities. A second useful flag (inserted into NSR in the final stages of the evaluation process) could indicate that the information on this nuclide in a given paper has already been included in ENSDF. (Yet another useful addition to NSR might be a link to an archived electronic copy of the actual paper, especially for less common literature sources.)

Proposal from Jacob Gilat, LBNL

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: # 12

Proposal:

A standard practice for incorporating horizontal evaluations into ENSDF shall be established. The data from the horizontal evaluation shall be provided to the evaluator of the corresponding mass-chain. This evaluator shall decide whether to incorporate these data into ENSDF as is, or after modifying it. If the mass-chain does not have a regular evaluator, or that evaluator is not available for this task, this authority shall be exercised by the NNDC.

Purpose:

To provide a mechanism for the orderly incorporation into ENSDF data from all horizontal evaluations.

Discussion:

A set of data from a horizontal evaluation will usually require changes in the corresponding Adopted Levels, Gammas data set. Sometimes, the person doing the horizontal evaluation will not be in a position to up-date the corresponding Adopted Data set. This would route the super-deformed band evaluations and decay-data evaluations through the A-chain evaluators rather than through a single reviewer. This would in principle, but probably not in practice, route some decay-data evaluations through the Utrecht group.

Proposal from Richard Helmer in response to issues raised by others.

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: # 13

Proposal:

The Network shall support the development of a code for simultaneously interpolating internal-conversion coefficients from the tables of Hager and Seltzer, Rösel et al., and Band for ENSDF format data sets. The evaluator will then use her/his preferred values and identify the table used. The difference between the values from the first two tables can be used as an additional indication of the uncertainty in the theoretical values.

Purpose:

To improve the evaluation methodology of the Network.

Discussion:

The French participants in the Decay Data Evaluation Project are supporting an effort by Russian theorists to produce an interpolation code that incorporates all three of these tables. By combining this code with a routine to read ENSDF data sets, it will be possible to interpolate ICC's for extended Z and energy ranges, and use the differences in the values as an indication of the uncertainty in the theoretical values. (There is a possibility that the French will also support the calculation of a new set of theoretical values.)

Proposal from Richard Helmer.

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: # 14

Proposal:

To make available a new set of measured distributions of log ft values for allowed and 1st forbidden beta transitions.

To use the most probable values from these distributions for estimating the intensity of beta transitions that can not be determined from direct measurements or intensity balances. The widths of these distributions can be used to estimate the uncertainty of the deduced beta intensities.

Purpose:

To improve the evaluation methodology.

Discussion:

These distribution are based on retrieval of about 8000 log ft values from the ENSDF database.

The current practice is to use the existing log ft systematics to determine a limit on the beta transition intensity when the intensity can not be determined otherwise. These new log ft distributions provide sufficient data to determine the most probably log ft value and the uncertainty thereof.

Proposal from Balraj Singh and Richard Helmer.

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: #15

Proposal:

The Network shall promote the use of the Limitation of Relative Statistical Weight, LRSW, method for averaging data and shall provide a computer program for this purpose. The Network shall also provide codes to average data by means of the Normalized Residual and RAJEVAL methods which provide aggressive treatments for the more discrepant values.

Purpose:

Promotion of more critical, and more uniform, evaluation of sets of measured values, especially where the values are discrepant.

Discussion:

The US NDN Subcommittee of Formats and Procedures endorse the recommendation of the Limitation of Relative Statistical Weights method in March 1996, and the international Decay Data Evaluation Project has adopted this method and is using it.

The IAEA Nuclear Data Section used this method in the "Co-ordinated Research Programme (CRP) on the Measurement and Evaluation of X- and Gamma-ray Standards for Detector Efficiency Calibration". It has been extensively used by the National Physical Laboratory (NPL), Teddington, for the evaluation of half-life results, and at the AEA Technology, Harwell, for the evaluation of half-life and gamma-ray emission probability data.

Proposal from Edgardo Browne, amended, by Richard Helmer

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: #16

Proposal:

Do evaluations only for Adopted Levels and Adopted Gammas. For all other data sets, only compilations will be done, or just provide directions to the appropriate references.

Purpose:

To reduce the work to be done to the available manpower.

Discussion:

None available.

Proposal from European evaluator

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: #17

Proposal:

Create a new type of ENSDF data set called IONIZED ATOM.

Purpose:

To provide retrievable storage of data related to ionized atoms, especially fully stripped atoms.

Discussion:

An example of this case is ^{163}Dy.

A new dataset should exist of the 163Ho with the following name: 163Dy B- DECAY (47D): IONIZED ATOM. In the next record a comment should appear that it is the 66+ ionic (fully stripped of electrons) state of 163Dy. The parent card should be 163Dy with an energy level that of the ionized atom, in this case a few keV or so. The daughter level populated in this decay should be just 163Ho gs. I do not know whether logft values can be calculated easily for such cases, since screening corrections will be different.

In 163Dy adopted level dataset, a level should be added near gs, such as a few keV for 163Dy with a %B-=100, T1/2=47 D +4-5 and a comment that this is an atomic excited state of 163Dy gs with all the 66 electrons stripped.

In 163Ho adopted level dataset, 163Dy B- decay (47 D) dataset should be listed under XREF and gs population from this decay should be indicated.

Proposal from Balraj Singh

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: #18

Proposal:

This Working Group suggests that the attendance of evaluators at the international meeting in December be limited to approximately four, unless DOE requests that more attend.

It is recommended that all technical proposals to be offered at that meeting by U. S. evaluators be conveyed in advance to the NNDC and that they be organized by the NNDC into a coherent group.

Purpose:

To limit the financial expenditure related to this meeting and to coordinate the technical discussions.

Discussion:

None

Proposal from Richard Helmer.

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: #19

Proposal:

This Working Group authorizes its Chair to pursue, during the period before the next Working Group meeting, with the appropriate members of this Group, any items from this agenda, and if necessary to accumulate information on these items to promote future decisions.

Purpose:

To promote action between meetings.

Discussion:

None.

Proposal from Richard Helmer.

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

Item: #20

Proposal:

Promote comments from the community that currently uses the Internet and WWW access to ENSDF by adding an option in the exit ritual that solicits comments on possible errors in the file and suggested improvements

Purpose:

To increase interaction with users.

Discussion:

None.

Proposal from Richard Helmer.

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

.

Item #21:

Proposal:

To establish a joint effort with the NuBASE group to horizontally evaluate new nuclides as follows.

1) Audi et al. and the Isotopes Project would track new nuclides as they appear in the literature.
2) The Isotopes Project would prepare ENSDF datasets for these nuclides on a priority basis.
3) The NuBASE group would review these evaluations.
4) ENSDF datasets would be submitted to the NNDC.

Purpose:

To update ENSDF, on a priority basis, new nuclides as they appear in the literature.

Discussion:

The Isotopes Project has been compiling and evaluating new nuclides on a priority basis[1] for over a year. These nuclides are also contunuously tracked by the NuBASE group (G. Audi et al)[2]. New nuclides are an important focus of interest in several research communities including nuclear structure, astrophysics, and radioactive beams. Coordination of the two parallel efforts will reduce potential duplication of effort.

[1] R.B. Firestone, Over 200 isotopes published in the ENSDF file in 1997.

[2] G. Audi, O. Bersillon, J, Blachot, and A.H. Wapstra, "The Nubase evaluation of nuclear and decay properties", Nucl. Phys. A6224, 1(1997).

Proposal presented by R.B. Firestone and G. Audi.

Nuclear Structure and Decay Data Working Group

U. S. Nuclear Data Network, April 27, 1998

.

Item #22

Proposal:

To modify the ENSDF format for spontaneous fission data as follows.

1) The "NR" normalization field should be used to normalize transition intensities so that the total intensity feeding the ground state is 100.
2) The "BR" normalization field should contain the fission yield so that Ig*NR*BR gives the gamma-ray yield per 100 fissions of the precursor.
3) A parent record should be provided for the fissioning nucleus.

Purpose:

To provide complete information with spontaneous fission decay datasets for normalizing the transition intensities to per 100 fissions.

Discussion:

Several recent experiments at the large Ge detector arrays have provided a large amount of new data for neutron-deficient isotopes. These data are being compiled by the Isotopes Project in ENSDF format. Minor modifications to ENSDF format and policy are proposed to normalize this data in a similar manner to other decay datasets. (Fission yields are available from the Spontaneous Fission home page at http://ie.lbl.gov/fission.html.)

Proposal presented by R.B. Firestone and J. Gilat on behalf of the GANDS collaboration.

Nuclear Structure and Decay Data Working Group
U. S. Nuclear Data Network, April 27, 1998

Item #23:

Proposal:

To make minor modifications to ENSDF format and policy as follows:
1) There should be a single (n,g) E=thermal dataset containing both primary and secondary gammas normalized per 100 neutron captures by the NR normalization. Separate datasets for primary and secondary transitions would be phased out.
2) The "BR" normalization field should contain the thermal neutron capture cross-section in barn units.
3) The Westcott g-factor should be included in a new field, possibly columns 65-76 on the normalization record.
4) The "NB" field should contain the isotopic abundance of the capture nucleus.
5) Multipolarities and mixing ratios should be taken from the Adopted Levels, Gammas dataset. Internal conversion coefficients should be included when appreciable.
6) Evaluators should typically normalize the gamma-ray data in such a way that the total intensity populating the ground state is 100. Gammas from Adopted Levels, Gammas dataset, missed in the measurements, should be added before this normalization. If either the total intensity deexciting the capture state is less than 100 or the energy-weighted sum of normalized intensities is lower than the Q-value it should be reported in a comment.
7) The capture state energy should be taken from the most recent mass evaluation.
8) New capture gamma-ray data measured with natural targets on thermal or cold neutron guides will be included whenever the isotope identification is unambiguous, as separate sets marked E=cold. These data will also be considered for the normalization of E=thermal datasets whenever the cross section is verified to obey the 1/v law.

Purpose:
To provide a uniform method of incorporating capture gamma data into ENSDF so that it will be complete and useful for applications.

Discussion:

An IAEA CRP has been funded for 1999-2001 to compile a database for Prompt Gamma-Ray Neutron Activation Analysis. Both the LBNL Isotopes Project and the Institute of Isotope and Surface Chemistry, Budapest plan to participate. The goal of the CRP is to create a new library of experimental data for thermal and cold neutron capture. LBNL will participate in the compilation and reevaluation, including a set of new data measured with natural targets for all stable elements at Budapest. The data will be compiled in ENSDF format and will be made available over the Internet at http://ie.lbl.gov/ng.html for those interested in the progress.
The final dataset will be offered to the evaluators' network for inclusion in the ENSDF file after proper checks are made.

Proposal presented by R.B. Firestone and G. Molnar