SUMMARY RECORD OF THE FOURTH MEETING OF THE WORKING GROUP ON INTERNATIONAL EVALUATION COOPERATION

28th and 29th May 1992
JAERI Tokai-Mura, Japan
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Participants :

Working Group Members:

C. Dunford (ENDF) Chairman
H. Gruppelaar (EFF and Subgroup 2)
A. Hasegawa (JENDL)
Y. Kanda (JENDL and Subgroup 4)
Y. Kikuchi (JENDL)
D. Larson (ENDF and Subgroups 1 & 11)
R. McKnight (NEACRF)
E. Menapace (JEF and Subgroup 7)
C. Nordborg (NEA)
M. Salvatore (JEF and Subgroups 5 and 9)
T. Yoshida (JENDL)

Subgroup Coordinators:

M. Kawai (Subgroup 10)
T. Nakagawa (Subgroup 8)
G. Rudstam (Subgroup 6)

Observers:

S. Chiba JAERI
H. Derrien JAERI
A. Ignatyuk IPEP Obninsk
V. Konshin IAEA Vienna
Y. Naito JAERI
S. Okajima JAERI
H. Takeno JAERI
Wang Dao CAEI Beijing

T. Asaoka, Director General of the JAERI Tokai Establishment, welcomed the participants.

The Chairman, C. Dunford, opened the meeting. Apologies for their absence had been received from E. Fort (NEANDC), H. Kusters (NEACRF), A.B. Smith (NEANDC), M. Sowerby (JEF), and P. Young (ENDF). A few of the invited subgroup coordinators were not able to participate in the meeting. The proposed agenda was adopted with the addition of a point on "Proposals for new Subgroups".
NEA NUCLEAR SCIENCE COMMITTEE

M. Salvatore informed the Working Party of the reorganisation of the NEA Nuclear Science Section. The former parent committees, NEACRP and NEANDC, and the NEA Data Bank Committee had been merged into one new Committee, called the NEA Nuclear Science Committee (NEANSC). The Committee had held its first meeting in December 1991 to define its programme of work. A large part of the activities were taken over from the old committees, such as the Working Group on International Evaluation Cooperation. Two other activities of interest to this Working Group, are: A review of data needs in the 1990s and the Data Centres Network, and an Inter-laboratory Cooperation on Experimental Activities.

The NEANSC decided to review, at its next meeting in June 1992, the activities of the Working Group. It was therefore suggested that the Working Group's Working Arrangements be updated, to reflect the present situation, especially concerning the membership of the Group and the cooperation with non-OECD evaluation activities. The importance of publicizing results of subgroup work and proper feedback to the user community was stressed, as well as the need for a close cooperation with the experimental community.

REPORTS FROM THE CooperATING EVALUATION PROJECTS

JENDL

The second revision of the JENDL-3 general purpose file is being planned and the aim is to have it completed by the end of March 1993. The main areas for the revision work will be the improvement and addition of heavy nuclides and gamma-ray production data.

The JENDL special purpose evaluation covers seven different areas: Dosimetry file, Gas-production cross section data file, Activation cross section file, Decay data file (in ENDF format), Fusion file, (a,n) reaction data file, and the KERMA and PKA file. The first two files have already been issued, whereas the other five files will most probably be released before April 1993. Plans to evaluate also charge-particle and high energy neutron data have been discussed.

JEF/EFF

The complete JEF-2.2 library, containing some administrative modifications, had been distributed to laboratories in January 1992. The main effort in the JEF project has recently been devoted to the processing and benchmark testing of the data. Many problems had been encountered in the processing of the new ENDF-6 format, which had delayed the benchmark testing. It had been decided to set up an NJOY User Group to discuss these problems. The Group has met twice.

In spite of the processing problems, first preliminary results from many different laboratories, giving feedback to evaluators, were presented at the JEF meetings in 1991. The results are generally satisfactory. For the fast
reactor range the performance of JEF-2.2 is comparable to that of adjusted libraries presently in use. However some areas need more benchmarking in order to draw firm conclusions.

The EFF-2 file has been compiled and is being processed for benchmark testing. The 1992 programme, consisting of file maintenance, improvements to processing tools and analysis of shielding benchmarks, has been defined and funded, and the next two years programme is under discussion. The third version of the EAF (European Activation File) library was released in May 1992. The associated code system, the EASY System, developed at Harwell, UK, was updated with this new version of the library.

ENDF

The following sub-libraries were released during 1991: charged-particle, radioactive decay and fission product yield data. In addition, the first revision of the neutron sub-library containing primarily minor corrections was distributed. A second revision is planned for the autumn of 1992. The summary documentation for ENDF/B-VI was completed and published in 1991 as well as a set of update pages for the format manual.

The results from the ENDF/B-VI data testing activity are still very preliminary and far from complete. Further development on the processing codes is continuing and additional benchmark testing results are planned.

The proposed budget reductions in the US nuclear data programme will most probably affect the CSEWG activity in different ways: the experimental programme will be drastically cut as well as the evaluation effort at Oak Ridge and Argonne, the support for the CSEWG will be decreased resulting in limited support for new major releases of ENDF/B-VI.

REPORTS FROM OTHER EVALUATION PROJECTS

BROND

A. Ignatyuk presented the present status of the BROND library. The second version, in ENDF-6 format, had recently been compiled, checked and release by the CJD, Obninsk, Russia. The original library is available in two versions: one with resonance parameters and one in point-wise form.

FENDL

The status of the IAEA coordinated FENDL (Fusion Evaluated Nuclear Data Library) project was presented by V. Konshin. The first version of the library had been compiled and it is intended to be finalised and distributed around the middle of 1992. It will consist of the following sub-libraries: a multi-group cross section library (VITAMIN-J structure), 256 of the most important neutron activation cross sections, charged particle data for the D-T plasma, and neutron dosimetry cross sections relevant to fusion applications. A second version of the library, FENDL-2, is being planned.
SUBGROUP ACTIVITIES

Subgroup 1: Inter-comparison of files for 52Cr, 56Fe and 58Ni

D. Larson presented a status report from the subgroup. The goal for the group was to resolve the most serious discrepancies (58Ni(n,a) and 58Ni(n,n') neutron emission spectra) for the evaluated files under consideration. Steady progress had been made and the 58Ni(n,a) discrepancy had to a large extent been understood. A shape difference was still to be investigated. A computer code to plot double differential neutron emission spectra had been developed.

In the discussion the followed it was decided that the subgroup should finish its work before the next meeting of the Working Group (June 1993). During this time, the subgroup should: Complete current detailed 58Ni investigations, including the double differential inelastic data, write a summary of the remaining discrepancies and recommendations, and circulate this paper to experts for comments, and finally recommend, if necessary, further work needed in this area.

The Working Group approved the addition of A. Mengoni to the Group, as well as the replacement of T. Asami and S. Chiba for S. Iijima and N. Yamamuro.

Subgroup 2: Generation of covariance files for 56Fe and natFe

There had been three parallel activities going on in this subgroup since the last meeting of the Working Group. F. Fröhner had produced covariance files for the resonance range of 54Fe and 56Fe, IRR Vienna was working on an improved version of the EFF-2 based 56Fe file, and Y. Kanda was generating covariance information for 56Fe from estimated uncertainties of model parameters used in the cross section calculations.

The subgroup would meet again at the occasion of the NEANSC Specialists' Meeting on Covariances to be held in Oak Ridge, USA in October 1992. Following this meeting, a report should be written, summarising the methods used, address applicability, investigate formats and group structures, and finally recommend any future work to be performed.

The Working Group agreed to include E. Menapace in the subgroup.

Subgroup 3: Actinide data in the thermal energy range

The major part of the work had been completed and had been reported at the recent nuclear data conference in Jülich, Germany. The discrepancy between the experimental results of 235U ETA obtained by the Geel and Harwell groups had at that time not yet been solved. Recent informal information indicated that, following further analysis of the data, the discrepancy was nearly resolved. M Sowerby was asked to verify this, and to arrange for a final report to be written before October 1992.
Subgroup 4: 238U capture and inelastic scattering cross sections

The investigation of the 238U capture cross section had been terminated and the results had been presented at the recent Nuclear Data Conference in Jülich, Germany, in May 1992. The comparison of the 238U inelastic cross sections showed that the total inelastic data were not very different in the files, but the partial data disagreed both in shape and value. New experimental data from Argonne, USA, were being analysed and nuclear model parameters have been deduced.

The subgroup would continue to study the remaining discrepancies between calculated and experimental data, and it was foreseen that the work would be completed in one year's time.

Subgroup 5: 239Pu 1 - 100 keV fission cross section

H. Derrien, presently working at JAERI, reported on the progress in the evaluation of the 239Pu data. He and T. Nakagawa had produced an new evaluated file containing resonance parameters up to 2.5 keV, obtained from an analysis of high resolution experimental data.

The subgroup had continued the critical examination of the 239Pu fission cross section measurement by Weston from 1984, which was about 3 to 5% lower than other results in the energy range 1 to 100 keV. Experimental programmes both at Geel and Oak Ridge are under way. Preliminary results show that the 1984 experiment by Weston should be renormalised by about +3 to +4%. This is also in good agreement with the above mentioned re-evaluation of the resonance parameters.

A final report would be written for presentation at the forthcoming (October 1992) Evaluation Methodology Conference at Brookhaven, USA.

Subgroup 6: Delayed Neutron Data Benchmarking

The work of the subgroup is progressing along three lines: Differential experiments, Integral experiments, and theoretical calculations. An experiment to determine F(n) values for individual precursors had been performed in Studsvik, and delayed neutron experiments for 238U are being planned in Birmingham, Dubna and possibly Obninsk. The planning of the integral experiment at Cadarache continues and the actual experiment will start in 1993. Theoretical modelling of fission yields and sensitivity analysis are on-going.

The Working Group accepted G. Rudstam's resignation as co-coordinator, following his recent retirement as professor at Studsvik. He would continue to work part time and remained a member of the subgroup.
Subgroup 7: Multi-group Cross Section Processing

E. Menapace and A. Hasegawa presented the activities concerning the creation of group cross section libraries. The NJOY code system is widely used in Western Europe and USA for these purposes and it was recommended that the most recent version (NJOY-91.38) should be used. Useful interface codes, between NJOY and other code systems were also presented.

Los Alamos have processed ENDF/B-VI data into different group libraries for various applications. RSIC has created VITAMIN-J and VITAMIN-J compatible libraries. In Europe, libraries based on JEF-2.2 are being processed into different schemes: VITAMIN-J, ECCO and X-MAS libraries. The JENDL-3 data are being processed by the code PROF-GROUCH-G/B into a 295 neutron - 104 gamma library called JSSDDL.

The subgroup was reminded that the goal was to coordinate the production of group cross section libraries for mutual exchange, and to a lesser extent devote efforts to resolving problems in processing codes. It was concluded that the subgroup would terminate its work within about one years time.

Subgroup 8: Minor Actinide Data

The purpose of the subgroup is to investigate the status of evaluated data for minor actinides, especially 237Np and 241Am, to perform benchmark calculations and to make recommendations for further experimental and evaluation work to be undertaken.

The first part of data comparison of 237Np and 241Am had been performed by T. Nakagawa, who would continue to investigate the data bases for 243Am and selected Cm isotopes. The Working Group approved the proposal to engage H. Takano as co-coordinator, responsible for the benchmark testing part of the activity.

Subgroup 9: High Priority Request List for Data Needs in Future/Advanced Reactors

M. Salvatores reported on the plans to compile a high priority list of data needs. Input from some members of the subgroup had been received, but it had been too early to assemble a complete picture from member countries. A summary document would be written by October 1992, and the final document would be ready in the middle of 1993.

Subgroup 10: Inelastic Scattering Cross Sections of Fission Product Nuclides

The scope of this subgroup is to review the data base (both experimental and evaluated), examine available nuclear model parameters, and perform integral data testing of evaluated data. The first isotopes selected were Zr, Mo, Pd, and Nd. Other fission product isotopes will be investigated later.
The graphical comparison of available data was well advanced, as well as the examination of the nuclear model parameters used in the different evaluated libraries. The planned integral testing would be started in 1993. A complete status report would be presented to the autumn 1992 evaluation methodology meeting in Brookhaven.

The Working Group agreed to add R. McKnight to the subgroup.

Subgroup 11: Intercomparison of the Resonance Regions of 52Cr, 56Fe, and 58Ni

Significant differences among evaluated libraries had been reported for the resonance parameters of 52Cr and the investigation was initiated for this isotope. The documentation of the different files had been thoroughly studied and graphical comparisons had been made. Further analysis of existing experimental data would probably contribute very little to improving the quality of present evaluations, so a new high resolution transmission experiment was being planned at ORELVA.

The comparison work on the resonance regions of 56Fe and 58Ni will be initiated in the summer of 1992.

ADMINISTRATIVE MATTERS

Working Group Chairman

Following the completion of the present chairman's mandate, the selection of a new chairman was discussed. M. Salvatores was selected, since he had been assigned responsibility for the Working Group by the NEA Nuclear Science Committee.

Working Arrangements

Following the reorganisation of the NEA Nuclear Science Section, it was considered of vital importance to update the Working Arrangements, established in 1990. The major revisions concerned the objectives and methods of work.

The objectives were expanded in terms of data needs and assessment of experimental requirements. The determination of common criteria for nuclear data files was indicated as a goal of the cooperation, in order to improve the quality and completeness of evaluated data and to enable their convergence.

A revision of membership was proposed, both to take into account the benefits of a well established cooperation with non-OECD countries through the IAEA Nuclear Data Section, and the need for a close contact with other NEA Nuclear Science activities, such as the Inter-laboratory Collaboration on experimental activities.

New updated version of the Working Arrangements is enclosed in Annex 2.
Cooperation with non-OECD countries

The cooperation with non-OECD countries was discussed in connection with the discussion on the Working Arrangements. It was decided to include, as Working Group members, one representative from the IAEA Nuclear Data Section, and up to two representatives from non-OECD countries, selected by the IAEA.

OTHER BUSINESS

Proposals for new subgroups

Y. Kikuchi proposed a subgroup on "Review of high energy data needs". The Working Group was positive to the proposal, but felt that the subgroup could not be started until after the next meeting, when a large number of the existing subgroup would have terminated their work. A small group, under Y. Kikuchi was set up to prepare for this new subgroup.

A proposal, submitted already at the last meeting of the Working Group, concerning a new subgroup on photo-nuclear data evaluation, would also be discussed at the next meeting.

NEXT MEETING

Following an invitation by M. Salvatores, it was decided to hold the next meeting at CEN Cadarache, France in conjunction with the JEF and EFF meetings planned for the second week of June 1993.
Annex 1

Documents presented at the meeting of the
Working Group for International Evaluation Cooperation

JAERI Tokai-Mura, Japan, 28th and 29th May 1992

IEC-33  Present Status of JENDL Project; Y. Kikuchi
IEC-34  Status of the JEF Project; M. Salvatores and C. Nordborg
IEC-35  EFF Project; Handwritten notes by H. Gruppelaar
IEC-36  CSEWG Report to NEANDC Working Group on International Evaluation Cooperation
IEC-37  BROND-2, General Purpose File
IEC-39  Status Report from Subgroup 1: Comparison of ENDF/B-VI, JEF-2/EFF-2, and JENDL-3 for 52Cr, 56Fe, and 58Ni; C.Y. Fu
IEC-40  Report on the work within Subgroup 2 of the Working Group on International Evaluation Cooperation since the last coordination meeting in May 1991; H. Vonach
IEC-41  238U Capture and Inelastic Scattering Cross Sections, Progress Report of the sub-group 4; Y. Handa
IEC-42  Progress Report of the Subgroup on 239Pu fission cross section between 1 keV and 100 keV; E. Fort
IEC-44  Status of Subgroup 7: Multigroup Cross Section Processing, U.S.A. Activities; R.E. MacFarlane, R.W. Roussin, J.E. White
IEC-45  Multigroup Cross Section Processing at ENEA Bologna; G.C. Panini
IEC-46  Conclusion and Recommendations of the 2nd NJOY User Group Meeting - 9th April 1992; E. Sartori
IEC-47  JSSTDL-295n-104g: a Common Nuclear Group Cross Section Library by PROF-GROUCH-C/B; A. Hasegawa
IEC-48  Subgroup 8: Minor Actinide Data (237Np and 241Am); T. Nakagawa
IEC-49 Subgroup on High Priority Data Needs for Future Advanced Reactors; M. Salvatores

IEC-50 Subgroup 10 on "Inelastic Scattering Cross-Sections of Fission Product Nuclides", M. Kawai

IEC-51 Status Report from Subgroup 11: Comparison of the Resonance Regions for 52Cr, 56Fe, and 58Ni; D.C. Larson

IEC-52 New Subgroup on High Energy Nuclear Data; Y. Kikuchi

IEC-53 Present Status of Photonuclear Data Evaluation Work in JNDC; N. Kishida

Annex 2

NEA Nuclear Science Committee

Working Party on International Evaluation Cooperation

Working Arrangements

29 May 1992

The evaluation cooperation activities described within this document will occur among the different evaluation projects within the Member Countries of the OECD Nuclear Energy Agency. Those projects currently are ENDF (United States), JEF/EFF* (Western Europe), and JENDL (Japan). Cooperation with the evaluation projects of non-OECD countries will be organised with the Nuclear Data Section of the International Atomic Energy Agency (IAEA).

Objectives

The Working Party is established to promote the exchange of information concerning nuclear data evaluations, validation, and related topics, and to provide a framework for cooperative activities between the members of the different projects. This will include the possible exchange of scientists to promote the cooperation. Requests for experimental data resulting from this activity will be compiled, and measurements to provide the required data will be encouraged. The Working Party will determine common criteria for evaluated nuclear data files. The aim is to assess and to improve the quality and completeness of evaluated data.

Methods of Work

A Working Party on Evaluation Cooperation is established under the sponsorship of the NEA Nuclear Science Committee (NSC). The Working Party will meet at least annually and a report on the progress of the cooperation will be made at that time to the NSC.

The Working Party will consist of up to four representatives of each of the three cooperating parties of the OECD, nominated by the projects; one representative from the NSC; one representative from the IAEA Nuclear Data Section; and up to two representatives from non-OECD countries, selected by the IAEA. The coordinator of the Working Party should be a member of the NSC and selected in consultation with the OECD project chairmen. In order to promote close cooperation with other NSC activities, the Working Party may invite appropriate coordinators to participate in its work.

The technical activities will be carried out by subgroups established by the Working Party. The function of the Working Party will be to supervise this cooperation. This will be accomplished by identifying data needs and problems to solve, deciding priorities and organising the effort to share the work within the cooperating projects.
Subgroups

The technical work of the cooperation will be performed by subgroups established by the Working Party to complete particular tasks. These subgroups will consist of members nominated by the Working Party, who have special expertise in the subject area and are willing to participate.

The subgroups will be responsible for their own working methods and for the selection of their coordinator. A member of the Working Party (monitor) will be assigned to follow the progress of each subgroup. Each subgroup will be responsible for providing an annual progress report to the Working Party and for a final report. Each subgroup will be dissolved when its task is completed.

Secretariat

The Secretariat of the Working Party will be the NEA. The secretary of the Working Party, a staff member of the NEA, will be responsible for maintaining the official records of the Working Party and organising meetings of the group in consultation with the chairman. In particular, the Secretariat will maintain a list of the cooperative activities in progress, which will include the names of the scientists involved and, on completion of the activity, a summary of the results prepared by each subgroup. Availability of information

The data files and the results of all cooperative activities will be available to all participants. Distribution of information within the cooperation will be to the Secretariat, the chairmen of the projects, and the IAEA Nuclear Data Section. Distribution of information about the cooperation to parties outside the cooperation will be made via the Secretariat.

* It is noted that the JEF and EFF projects are closely related. The EFF project is funded partly by the European Community Fusion Technology programme, whereas the JEF project is a joint project of the NEA Data Bank Member countries.