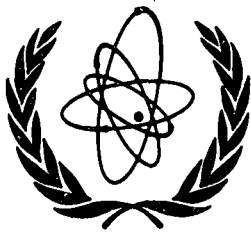


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International Atomic Energy Agency

INDC

INTERNATIONAL NUCLEAR DATA COMMITTEE

CHAIRMAN'S REPORT ON THE INDC FOR 1972 AND 1973

By

L.N. USACHEV

Original submitted in English

Edited by the IAEA Nuclear Data Section

NDS LIBRARY COPY

February 1975

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INTRODUCTION

The development of international cooperation in the field of nuclear data in the framework of the International Atomic Energy Agency (IAEA) started ten years ago. During this period, a world-wide system of cooperation has been created.

During the 1972-1973 period, the International Nuclear Data Committee, serving as an advisory body to the IAEA, has continued its established activities and pursued an expansion and deepening of this international cooperation.

EXPANSION OF INDC RESPONSIBILITIES

The responsibilities of the INDC were broadened beyond its traditional neutron data scope to include nuclear structure and reaction data in response to the demand for nuclear data in all branches of science and technology of interest to the IAEA. The need for the expansion of its activities was clearly demonstrated at the Symposium on Applications of Nuclear Data in Science and Technology held by the IAEA in March 1973 in Paris in accordance with the recommendation of the INDC. The International Working Group on Nuclear Structure and Reaction Data, organized by the IAEA played an important role in the organization of this symposium and in the first assessment of the needs for "non-neutron" nuclear data. Upon the dissolution of this Working Group, the INDC was entrusted with the function to coordinate the international cooperation in this field.

REORGANIZATION OF INDC SUBCOMMITTEES

In order to solve the new problems facing the INDC, the structure of the INDC standing subcommittees was reorganized. It also became evident that the future policy in the field of nuclear data should be determined by the requirements for nuclear data in specific fields of applications.

For this reason, in determining the responsibilities of the subcommittees, the methodical principle to separate nuclear data into neutron and non-neutron nuclear data was rejected. It should be noted,

however, that the separation of responsibilities on a discipline-oriented basis is reasonable when organizing data centers, insofar as their discipline-oriented specialization should result in an increase in data reliability.

The responsibility of the new standing subcommittee on Nuclear Data for Energy Applications is to recommend policy concerning the generation and satisfaction of nuclear data request lists in the whole area of nuclear energy technology, and to monitor the interface between producers and users of nuclear data. It was also agreed that the nuclear energy area be subdivided into the following fields: reactor cores, fuel processing, waste disposal, shielding, safeguards, inpile radiation measurements and fusion. It is intended that the subcommittee's major attention be concentrated on one or two of these fields only at any given time.

The subcommittee on Nuclear Data for Non-Energy Application is intended to cover various broad fields of nuclear data applications. Its role is to make recommendations on the policy concerning the generation and satisfaction of requirements in the compilation and evaluation of nuclear data as well as to maintain the interfaces between producers and users of nuclear data in all the applications relevant to the IAEA except for the nuclear energy area, i.e. biomedical sciences, industrial and agricultural applications, etc. In order to accomplish this, it is still necessary to decide on a workable breakdown into application areas, to identify the corresponding national and international organizations in these areas and to find appropriate methods of cooperation with these organizations.

It was also decided that in order to realize the technical function of compilation and dissemination of non-neutron nuclear data, a network of centres, analogous to the four neutron data centres, should be developed. To initiate this development it was decided to convene in April 1974 in Vienna the so-called "X-Centres Meeting", later renamed "IAEA Study Group Meeting on Nuclear Data for Applications."

The standing subcommittees on "Standards" and "Discrepancies in Important Nuclear Data and Evaluations" were retained as technical subcommittees, i.e. these subcommittees consider specific problems of measurement and evaluation of specific, mainly neutron nuclear data. By retaining these subcommittees, the INDC stressed the importance of its traditional activities in the field of neutron nuclear data.

TRADITIONAL NEUTRON DATA ACTIVITIES

In its structure, the traditional activity of the INDC is rather logical, but there still remains much work to be done. The operating mechanism of cooperation is characterized by three concepts: WRENDA, CINDA and EXFOR. One more concept, corresponding to the world library of evaluated data, is absent.

WRENDA, the world-wide request list for neutron data, naturally, is the basis of the structure of this activity. Formulated in accordance with INDC recommendations, this list is a compilation of requests submitted and revised by the participating Member States every year. The INDC recommended the adoption of a unique definition of the accuracies required and that evaluators who have a good knowledge of the status of the data which they evaluated, engage themselves in the review of WRENDA requests. The unique accuracy definition is to be used in the future by reviewers. When these recommendations are realized, WRENDA will become a most valuable document which will compactly represent the state of neutron data knowledge, characterized by their uncertainties, as well as by the accuracy required from the viewpoint of the data application. By comparing the existing uncertainties of the data and the required accuracies it would then be evident whether additional measurements ought to be performed.

The Committee also improved request lists for nuclear data for fusion reactor technology and nuclear materials safeguards.

As a result of the coordinated efforts of the Four Neutron Data Centres, the following systems are now operational: CINDA - the Index to the Literature on Microscopic Neutron Data, a catalogue of all neutron works published in the world, is published and updated annually, and EXFOR - the international system for the exchange of experimental neutron data. For the latter system to function, the regular exchange of neutron nuclear data on magnetic tape in the common exchange format EXFOR between the four neutron data Centres, has been of greatest importance.

The more complete a library is, the more valuable it is. EXFOR includes half of all experimental neutron works published after 1970 - about 1 million experimental points. An additional quarter of all of these works exists in the centres' internal formats and their translation into the EXFOR format is a matter of time. However, some numerical data resulting from a number of very important

experiments, some presented at the Helsinki Conference in 1970, have not yet been obtained by the data centres. It was agreed by the INDC that the problem of obtaining data from the experimentalists should be solved. In this connection, CINDA was also discussed as an EXFOR index. Now the numerical material which is available at the four neutron data centres, is denoted in CINDA by a flag. A more developed system of flags, that would denote not only the presence of information but its preliminary or final character, should be considered in context of solving the problem of data non-availability.

ILEND - an International Library of Evaluated Neutron Data. Such a concept still does not exist. This acronym is being proposed here for the first time with the hope that if the name is given, the library as well as the activities which would lead to its creation, would be realized.

An agreement for broad international cooperation in the exchange of evaluated neutron data has not yet been reached. Discussions of this problem are being held at each INDC meeting. Some countries have not yet developed evaluation procedures on a full scale, other countries and their organizations have not yet determined their position in the solution of this problem. Nevertheless, the IAEA has a significant number of evaluated data files: UK files, West-German KEDAK files, Soviet files, US ENDF/B files on seven standard materials, Italian and Australian fission product nuclear data files, etc. This is the beginning of ILEND.

It is extremely urgent for the INDC to solve the problem of evaluated neutron data, because the evaluated data are the data needed by the applied users.

OTHER IMPORTANT PROBLEMS

The targets and samples program (which was funded by the IAEA at 17,000 dollars per year in 1974) is of great importance to the performance of nuclear data experiments in developing countries. This program, and ways of increasing its efficiency, have been discussed by the INDC. The "Ad Hoc Subcommittee on Nuclear Data Measurement Programs for Developing Countries" was established for that particular purpose; it recommended that the targets and samples program should be coordinated with WRENDIA requirements. Bilateral cooperation between developing countries as well as funding support from other international organizations have been recommended in accordance with the further development of the program. The use of these experiments with an aim to train specialists in developing countries should be kept in mind.

MEETINGS, CONFERENCES

Two IAEA Panels were successfully carried out during these two years: the Panel on "Neutron Standard Reference Cross Sections", held in Vienna on 20-24 November 1972, and the Panel on "Fission Product Nuclear Data" held in Bologna, Italy, on 26-30 November 1973. In addition, the "Symposium on Nuclear Data in Science and Technology", referred to above, was held in Paris in March 1973.

NDS - THE INDC SECRETARIAT

The IAEA Nuclear Data Section has worked with efficiency, successfully fulfilling its ever increasing amount of work. The contribution of NDS towards all achievements mentioned above can hardly be over-estimated.

CONCLUSION

Cooperation within the framework of the International Nuclear Data Committee is being successfully developed. Numerous important projects which have already been realized, are now bearing fruit. The future solution by INDC of a number of the above-mentioned problems would bring the activities of the committee close to optimum efficiency. This progress would contribute much to increasing the efficiency of a number of fields of science and technology, needing nuclear data, in all IAEA Member States.