

ENEA Neutron Data Compilation Centre Progress Report

May 1968 to May 1969

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(Presented by V.J. Bell, Head of the CCDN)

I. INTRODUCTION

During the period under review the CCDN, as a European compilation centre, has continued to evolve both within its region and as one of a number of compilation centres occupied with the world-wide collection and dissemination of neutron data information.

A large effort has been made to implement a workable data storage and retrieval system. The conclusion of the first phase of this effort has been marked by the initiation of the regular dissemination of experimental data by the CCDN from the beginning of 1969, the recent publication of Newsletter 8 containing a revised index to the NNCSC/CCDN experimental neutron data library, and the publication of the NEUDADA system description report.

Several physicists have developed some insight in programming techniques, which is valuable for the deeper understanding of the problems of information systems, and in fact necessary for an efficient utilization of the programming effort available.

II. SCIENTIFIC WORK OF THE CENTRE

(a) The Data File

A considerable effort has been made to implement a workable computerized storage and retrieval system for experimental neutron data at the CCDN.

During the first half of 1968, the ECSIL system was implemented at the CCDN, and is now working with the LRL data and bibliographic library dated March 1968. The system is used at the CCDN for retrievals, and the updating features have been tested with the full data library to enable regular updates to be made, if this is found to be necessary.

The NEUDADA system was developed at the CCDN to support the SCISRS I data library and to make full use of the direct access storage discs of the IBM 360/30. The translation and implementation of the full SCISRS I library for use with this system was made at the CCDN in the second half of 1968. The dissemination using NEUDADA of data retrieved from the full library was started in January 1969. A supporting system of programmes has also been developed at the CCDN for preparing an edited version of the internal

data file index for publication. This work involved checking and correcting the reference abbreviation and principal author for each entry in the file and is required in order to know the precise contents of the data library and to make possible the subsequent automatic correlation of this library with CINDA.

A number of large data sets have recently been translated and entered into the data library (Cierjacks (KFK): Fe, C, O, Ti, Bi, Ca, Na, Al, S total cross sections; Rohr (KFK): V-51, Mn-55, Fe-nat, Fe-57 total cross sections; Brunner (WUR): Dy, Ir, Lu total cross sections; Weigmann (Geel): Mo (n,) cross sections; Cao (Geel): U-235, Pu-240(n,f) cross sections and Pu-240 scattering yields; Schomberg (HAR): Pu-239 and (n,f) cross section). It is now also possible to store information compiled in the CCDN compilation format. The TONDADA system has been developed to enter the above information into NEUDADA.

A modified version of the ECSIL Bibliographic system, called CREED (Compilation of References to Experimental Data) has been developed for use as a bookkeeping system for the CCDN data compilation activity.

A system of programmes has been developed to plot cross-section data retrieved from either the ECSIL or the NEUDADA data library.

(b) SCISRS II

In the second half of 1968 the CCDN contributed to an international team of programmers from a number of compilation centres which gathered in the NNCSC, Brookhaven, to assist in the development of a new data storage and retrieval system. As a result, programmes to translate the SCISRS I data library into SCISRS II format with disc storage, and programmes to make limited retrievals from these files were developed and have been implemented at the CCDN.

In conjunction with this system development work, there have been discussions among physicists, both experimentalists and evaluators, on extending the amount of information which should be compiled and included in an experimental neutron data library and also on the scheme which should be adopted to classify these data.

At present the CCDN is continuing in its efforts to achieve agreement in both these areas and has been extending the amount of information which is compiled for a given experiment to take these developments into account. These compilations are stored in the NEUDADA data library.

(c) CINDA

CINDA 68 was distributed at the end of July last year, while European distribution of the supplement was made at the beginning of March. CINDA 69 went to the printers (OECD) at the end of May, and includes all entries received up to the beginning of the month.

Most of this year's work on CINDA at the CCDN has gone to finding and filling gaps in the coverage before about 1962, and to bringing the last remaining European entries in the old format up to current standards, in preparation for a second attempt during the coming year to consolidate multiple entries for the same work. Back coverage will be extended further, both by systematically checking main journals and by reference to K. Parker's and J. Story's private card files.

Though other commitments have prevented any changes to the CINDA programmes, much of the necessary groundwork for automatic checking of CINDA against the data file has been done in connection with Newsletter 8. As an interim measure CINDA 69 contains the list of all references from which data had been stored in the CCDN file at the time of the Newsletter. While the criticisms this could raise concerning data missing from the files may be embarrassing in the short run, it is felt that this list may result in missing data being sent spontaneously to the centres, as well as further identifying the areas of coverage about which our users are most concerned.

Preliminary CCDN proposals concerning the reprogramming of CINDA have been submitted to the other centres, and it is hoped to define the physical and operational part of the system during a mission by Dr. Tubbs to Oak Ridge and Columbia University this summer.

(d) Evaluated Data

An information sheet giving details of the evaluated data files which are available at the CCDN for distribution in participating countries was circulated at the end of 1968. Although the distribution list for this document was quite small, a number of copies were given to each recipient who was asked to arrange circulation and distribution within individual laboratories of participating countries.

The CCDN received the KEDAK library in card image format in March 1969, and distribution has now started.

An updated version of the compilation of evaluations of neutron cross-sections was prepared for publication and distribution as Newsletter 9 in May 1969.

Work has started on the development of a system of programmes for the storage of the UK Nuclear Data Library on disc and for the subsequent retrieval from the file, by nuclide or process. The system will also include options for plotting cross-section data, and for the superposition of evaluated cross-section data plots on plots of the available experimental data retrieved from the data library.

(e) RENDA

During the period under review the CCDN continued to assist the EANDC secretariat in the development and operation of the RENDA system and data file. This work, although directly applicable only to the EANDC request list for neutron data measurements, has enabled the CCDN to develop algorithms for the preparation of conventional (upper and lower case) character strings, which it is hoped will lead eventually to the use of automatic type-setting equipment for CCDN publications.

(f) Direct Compilation

During the period under review the CCDN has continued to move towards the adoption of DOS for normal operational use, and has experimented with the partitioned operation of the computer. In March 1969 two IBM 2260 display stations were added to the computer and will be used for experiments in direct compilation and maintenance operations with the CCDN information files.

III. EXTERNAL RELATIONS

United States

Good relations were maintained with the NNCSC, Brookhaven, and the regular exchange of experimental and evaluated data has continued satisfactorily. CINDA exchanges with Professor H. Goldstein of Columbia University and Mr. L. Whitehead of D.T.I.E., Oak Ridge, and ECSIL co-operation with Mr. R. Howerton of LRL, Livermore, continued to run smoothly.

I.A.E.A.

A four-centre meeting between the NDU (Vienna), NNCSC (Brookhaven), ICND (Obninsk), and the CCDN was held in Vienna in December to discuss questions of mutual interest, and in particular to prepare for the IAEA Neutron Data Compilation Panel in Brookhaven.

Data retrieved from the CCDN CINDA and NEUDADA files have been sent without restriction to the NDU, and during the course of the year the exchange of European evaluated data between CCDN and NDU has been initiated on a limited scale.

I.A.E.A. Neutron Data Compilation Panel

A paper entitled "CCDN - A European Contribution to the World-wide Collection and Dissemination of Neutron Data Information" was presented by the Head of the Centre to this Panel. The report of this Panel has been discussed during a recent meeting of the CCDN Committee, and it was generally agreed that it provided excellent guidelines for future compilation activities.

Europe

The effort has been continued to visit the principal experimental laboratories in Europe, and to encourage them to send their data to the CCDN in a form which is readily compatible with the NEUDADA system. Visits have been made to Harwell, U.K., and Geel, Euratom, to this end.

Scientific Visitors

Professor Nakasima of Hosei University, Japan, spent 10 weeks in the first half of 1968 as a scientific visitor to the CCDN. During this time he worked on checking the coverage of Japanese CINDA entries, and in making a survey on the available experimental and evaluated data for the total cross-section of lead below 100 keV. It is intended to include this work in a forthcoming Newsletter.

The CCDN is planning to encourage member countries to send experimental physicists and evaluators to the CCDN for periods of time in order that they may be more familiar with the work of the Centre, and in order that the most up-to-date European data are available for compilation at the CCDN.

IV. RECENT PUBLICATIONS

During the period under review the CCDN was involved in the preparation, publication and distribution of the following documents:

CINDA 68 An Index to the Literature on Microscopic Neutron Data
 (EANDC 77 'U', CCDN-CI/23, TID-24489), 15th June 1968

CINDA 68 Supplement, 15th January 1969

Newsletter 8 Index to the NNCSC/CCDN Experimental Neutron Data Library,
 15th March 1969
 (CCDN-NW/8), March 1969

Newsletter 9 A compilation of evaluations of neutron cross sections
 available at March 1969
 (CCDN-NW/9), April 1969

REND A System description
 (CCDN-SYS/1), November 1968

NEUDADA Neutron Data Direct Access, System description
 (CCDN-SYS/2), May 1969

REND A Compilation of EANDC Requests for Neutron Data
 Measurements
 (EANDC 78 'AL'), December 1968