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Report to the INTERNATIONAL NUCLEAR DATA COMMITTEE

OECD/NEA Data Bank

Activities in 1985-86

I. INTRODUCTION

1. Perhaps the single most important event in 1985 was the completion and distribution in Member countries of the first version of the Joint Evaluated File (JEF-1). Although this work on JEF attracted more attention in many of the larger laboratories, normal compilation work for EXFOR and CINDA continued on the neutron data side. Due largely to distribution of JEF, the number of logical data records sent out to users over the year was 38 million as compared to 10 million during 1984. In the same period 112 computer programs were tested and included in master files, and 1209 program packages were sent out to users. Work continued on the Program Testing System (PTS) in order to improve efficiency in using outside computer time.

2. Work in cooperation with the NEA main secretariat covered projects in waste management (the ISIRS and Thermochemical data bases, and assistance to the SYVAC project) and nuclear safety (development of a retrieval system for reports from the Incident Reporting System IRS). Transfer to IAEA of responsibility for preparing the CINDA file for annual publication was successfully completed. The Arrangement for the exchange of programs and data between the United States centres and the Data Bank was renewed for a further five-year period. The eighth Nuclear Reaction Data Centres meeting, of the four original neutron data centres plus others responsible for compiling charged particle interaction data, was held at the Data Bank in October 1985.

II. COMPUTER PROGRAM SERVICES

3. A total of 112 programs were tested, packaged and master filed in 1985. This represents a 14% increase over the previous year: a part of this increase is due to the smaller losses through staff vacancies, while the implementation of the PTS (Program Testing System) software made an important contribution. 110 programs in all were received from member institutions, 61 of them from U.S. centres and five from non-OECD countries. The programs are normally sent via nationally nominated Liaison Officers, representing 403 user organisations in Member countries. Service is given to 'occasional requesters', usually for mathematical and computer oriented packages and only for programs already on file, where further requests are unlikely. 344 such users are on record.

4. In service to member institutions, 1209 program packages were sent out in all (981 to OECD countries, 228 in the IAEA program service area). A breakdown shows that apart from the very strong demand (much of it from occasional users) for mathematical packages, the two most popular categories were 'Radiological Safety, hazard and accident analysis' and 'Gamma heating and shield design'. The most requested individual packages for reactor systems calculations were : MCNP (from LANL, 13 copies); the VITAMIN-J 175 group shielding cross-section set (derived from the JEF file, 13 copies); RELAP 5 MOD 1/25 (12 copies, from Idaho Falls); SSYST (from KFK, 10 copies); ORIGEN-2 (from ORNL, 9 copies). It is interesting to note that the Data Bank has distributed 443 copies of successive RELAP versions, over more than a decade.

Use of IAEA computers

10. In compensation for the rise in recent years in dispatch of program packages to non-OECD countries, IAEA has made time available on its IBM-3081D computer installation, for program testing. Approximately 2 1/2 hours CPU time were used in 1985 on two missions to IAEA.

III. NUCLEAR DATA SERVICES

11. During 1985, 103 EXFOR works were transmitted to other neutron data centres: 41 new compilations and 62 retransmissions. Much new data was presented in the Santa Fé Conference (May 1985) and has gradually been reaching the Data Bank. 33 new compilations have been made since January 1986, while 23 requests for data were still outstanding. A great many retransmissions of older data have been requested by NNDC for inclusion in a new book of curves (a successor to the Barn books). It is expected that some 40 such retransmissions will have been made by the time of the meeting, generally for relatively minor corrections.

12. The transfer of full responsibility for the contents of the CINDA book to IAEA Nuclear Data Section was made as planned in October 1985 : both NDS and the Data Bank produced tapes for generating the supplement to CINDA 85. These tapes were compared before use, in order to check the working of the new NDS CINDA system. Full symmetry has now been achieved in exchanges of CINDA entries and corrections between NNDC, NEA Data Bank and IAEA/NDS. It is expected that CJD Obninsk, will develop a full CINDA storage system to allow 4-way symmetry.

The Joint Evaluated File project (JEF)

13. Following the release of the JEF-1 general purpose file in April 1985, work continued on the special files tape, notably in order to finalise the radioactive decay data and fission yields files. These tapes were sent out in September 1985.

14. Benchmarking work continued throughout 1985 in participating laboratories and in the Data Bank: fission product data were tested in Petten and Cadarache, while the full set of Los Alamos criticals were calculated in EIR Wuerenlingen. A new coherent system of benchmarks for data testing was under development in Cadarache. At the Data Bank, calculations using four different group structures for JEF-1 data were compared with experimental values for a set of Pu- and U-fuelled critical assemblies plus two infinite homogeneous media experiments.

15. A 175-group cross section set for shielding calculations, VITAMIN-J, was derived from JEF-1, and distributed in Member countries. Maintenance work on JEF has so far been limited to minor corrections in response to user feedback, while the extensive use of the program NJOY in preparing group cross-section data led to the detection and correction of many minor errors in coding.

VI. INVESTIGATION OF NETWORK USE

22. The Data Bank was connected to the French TRANSPAC network at the end of 1985. In order to prepare the way for service to customers via this network, security of access to the VAX has been thoroughly reorganized, around the most recent version of the operating system, VMS 4.2. Due to delays in obtaining all the matching updates of other software packages, use for networking experiments has so far been limited. A program package has been sent to the University of Brussels (ORIGEN-2), and it has proved possible to log into the ANL computer using our connection to the IBM computer in Orsay and the EARN/BITNET connection. A similar experiment with LBL Berkeley showed no difficulty in connecting via TRANSPAC and TYMNET or via EARN/BITNET, but we do not yet have the right file transmission protocols. The key questions are the cost of transmitting large files at off-peak hours, and the risks of data/-program corruption. We hope to learn more in the coming year.

VII. PUBLICATIONS IN 1985

23. Nuclear Program Abstracts A full revision of the RSIC list, and a new version of the index.

News from NEA Data Bank 3 issues.

Neutron Nuclear Data Evaluation Newsletter One issue in 1985, a second in January 1986.

Newsletter No. 31 (December 1984, distributed in 1985) Computing aspects of the RELAP-5 MOD-1 code.

Newsletter No. 32 Pre-equilibrium effects: an international nuclear model and code comparison.

A first group of JEF Reports was issued to participants in the project, and this series will continue to provide documentation on the JEF file.