

INDSWG-97

INDSWG - 97

INDSWG(US)-21

CURRENT THINKING ON DATA STORAGE AND
RETRIEVAL SYSTEMS AT BROOKHAVEN

Murrey D. Goldberg
Sigma Center
Brookhaven National Laboratory
Upton, New York

August 10, 1965

At the meeting of the IAEA Advisory Panel on Nuclear Data Compilation (Vienna, 29-31 March 1965) it was suggested (Point 16 of the Report) that the US and ENEA data centers provide statements regarding their current thinking on data storage and retrieval problems for the September INDSWG meeting in Tokyo. The following is a summary of such thinking in the US center (Sigma Center - Brookhaven National Laboratory).

During the past two years a system has been evolved to satisfy the specific needs of Sigma Center in the field of data storage and retrieval. The program has been given the name SCISRS (Sigma Center Information Storage and Retrieval System). A report describing the details of SCISRS was issued in July 1964 as BNL-883 by the program developers, Jerry M. Friedman and Marc Platt. Considerable operating experience has been gained by the Center during these two years in the problems associated with day-to-day use of such a system, and SCISRS is now considered a usable tool, containing a large fraction of the accumulated data ($\approx 150,000$ individual points).

SCISRS was conceived of and developed as an instrument to assist Sigma Center in its continuous activities in the accumulation and dissemination of neutron cross section information. Some of the more obvious areas in which such a system could be useful to the Center can be enumerated as follows: (a) simple, compact, and uniform storage of large quantities of individual data points

000102



IAEA
NUCLEAR DATA UNIT
MASTER COPY

August 10, 1965

which come to the Center in many different forms, requiring diverse filing methods; (b) quick direct storage of the large amount of data which currently come to the Center in the form of punched cards or on magnetic tape; (c) quick retrieval of the data needed to answer the myriad questions asked of the Center regarding the data or requests for the actual points themselves; and (d) assistance in the plotting of the data (by means of computer-oriented mechanical plotters) for such publications of the Center as BNL-325 and BNL-400 and for the convenience of many of the requestors. To accomplish these purposes, SCISRS was programmed in a language deemed most suitable for the IBM computer facility here at Brookhaven.

Two developments, which have occurred since the conception and programming of SCISRS, have required a rethinking of the requirements for such a system. The first development was the interest expressed by various data-using organizations in the US for copies of the complete library tape so that the experimental data could be tied directly through the computer to their working programs. The second development was the bilateral agreement between the US and the ENEA which resulted in shared responsibilities for the collection, storage, and dissemination of the experimental data between Sigma Center and the NDCC (Saclay). These developments raised the particular problem of the compatability of the SCISRS language with diverse computer systems. It was found that the machine language adopted as best for the Brookhaven computer system was not best for use at other facilities. Also, Brookhaven is acquiring a CDC computer system which will require extensive machine adaptation for SCISRS here.

In addition to the problem of machine compatability, day-to-day experience with SCISRS in Sigma Center has indicated a number

of areas in which changes would be desirable. Some of these are simple input or output format changes, but some are of a more fundamental kind. In particular, it seems desirable to switch to a reference-oriented system, separating data-pertinent information from reference-pertinent information. An accession number sequence would be used to link the two sets of information. Besides the benefits accruing to the Center with such a system, it would greatly facilitate the linking of SCISRS with other compilations in this field; in particular, with the CINDA literature index.

To speed up the development of a "second generation" SCISRS, embodying both a more universally compatible machine language and a re-orientation to an accession number sequence, it was agreed in May 1965 that R. J. Howerton, of Livermore, would try to develop a proposed system containing both these features and satisfying the joint needs of the data centers and the user laboratories. The proposal, tentatively set to be presented in September, would be circulated to interested parties for comments and criticisms and then finally programmed. It is assumed that most of the information contained in the present SCISRS format will be machine translated into the new format so that a minimum amount of duplicated effort will be involved.

Since Sigma Center has had many years of experience in the field of accumulating and disseminating neutron cross section information, and since the NDCC (Saclay) will rapidly accumulate such experience, it is felt here that these two centers should develop a final data handling system which the IAEA can adopt and readily adapt to its own interests. The assistance of other centers, such as Livermore, in solving the machine problems which arise in the development and use of such a system should greatly aid in the flexibility of future SCISRS.