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ear data sets for reactor design calculations

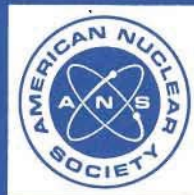
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**American National Standard
Nuclear Data Sets for Reactor
Design Calculations**

**Secretariat
American Nuclear Society**

**Prepared by the
American Nuclear Society
Standards Committee
Working Group ANS-19.1**

**Published by the
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Foreword (This Foreword is not a part of American National Standard Nuclear Data Sets for Reactor Design Calculations, ANSI/ANS-19.1-1983.)

It is the intent of this American National Standard to present specifications for the preparation of nuclear data sets for use in reactor physics computer programs employed in the design of nuclear reactors and to specify certain data sets as standards. The nuclear data used in reactor design calculations are fundamental physical quantities and, hence, are independent of reactor type. The lack of complete, exact experimental measurements requires the use of evaluated estimates of the data. This standard specifies guidelines for such evaluations and specifies how the resulting data sets should be processed, tested, validated, and documented.

This standard is intended primarily for nuclear data used for reactor core calculations. However, it may be of use in shielding calculations and in other areas, such as dosimetry and fusion.

This standard presents specifications for the preparation of evaluated Nuclear Data Sets, processed continuous data sets, and energy averaged data sets for use in nuclear reactors. ENDF/B-V is identified as a standard Evaluated Data Set. No Processed Continuous Data Set or Averaged Data Set is identified as a standard at this time. It is believed that the development of standard Processed Continuous Data Sets and Averaged Data Sets for use in reactor design is an achievable goal and, therefore, procedures have been established in this standard for achieving this objective.

This standard was developed by Working Group ANS-19.1 of the American Nuclear Society Standards Committee, which had the following members at the time it prepared and approved this standard for revision:

D. R. Harris, Chairman, <i>Rensselaer Polytechnic Institute</i>	A. Jonsson, <i>Combustion Engineering, Inc.</i>
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P. B. Hemmig, <i>U. S. Department of Energy</i>	O. Ozer, <i>Electric Power Research Institute</i>
	E. Pilat, <i>Yankee Atomic Electric Company</i>
	P. F. Rose, <i>Brookhaven National Laboratory</i>

*R. A. Dannels, deceased, was chairman of the effort to develop the original version of this standard (N411-1975). His contributions to its revision prior to his death are gratefully acknowledged by the working group.

Working Group ANS-19.1 gratefully acknowledges Mrs. Frances L. Ganster whose tireless efforts and excellent work were invaluable in the development, formatting, and typing of Draft 1.

The working group also recognizes the participation of J. Rec (Combustion Engineering, Inc.) in the revision of this standard.

Suggestions for improvement of this standard will be welcome. They should be sent to the American Nuclear Society, 555 N. Kensington Ave., La Grange Park, Ill. 60525.

Standards Subcommittee ANS-19 of the American Nuclear Society had the following members at the time it processed and approved this revised standard:

- | | |
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The American National Standards Committee N17, Research Reactors, Reactor Physics, and Radiation Shielding, had the following membership at the time it reviewed and approved this standard:

- R. S. Carter, Chairman
 T. M. Raby, Secretary

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Nuclear Data Sets for Reactor Design Calculations

1. Scope

1.1 General. This standard identifies and describes the specifications for developing, preparing, and documenting nuclear data sets to be used in reactor design calculations. The specifications include (a) criteria for acceptance of evaluated nuclear data sets, (b) criteria for processing evaluated data and preparation of processed continuous data and averaged data sets, and (c) identification of specific evaluated, processed continuous, and averaged data sets which meet these criteria for specific reactor types.

1.2 Applications. Nuclear data sets shall consist of basic microscopic nuclear physics data which include but are not limited to the important neutron-induced reactions. The data set, in the processed form, will be primarily utilized as input to fission reactor core design calculations, but may have applications to other fields, such as shielding, dosimetry, or fusion studies.

The specific types of data sets considered to fall within the scope of this standard are shown in Figure 1 and defined more precisely in Section 2, Definitions. As indicated in Figure 1, the scope of this standard does not pertain to experimental techniques for the measurement of nuclear data or to the development of nuclear model theory. The scope does not apply to a few-group collapsed data set, which is representative of a particular application except for a requirement for the documentation of collapsed data sets when such data sets are prepared as part of the testing of the nuclear data sets covered by this standard.

The distinguished features of data sets considered to fall within the scope of this standard are that they can be represented as being applicable to a wide range of reactor compositions, geometries, and spectra.

2. Definitions

benchmark. A well-defined set of physical experiments or mathematical constructs whose results

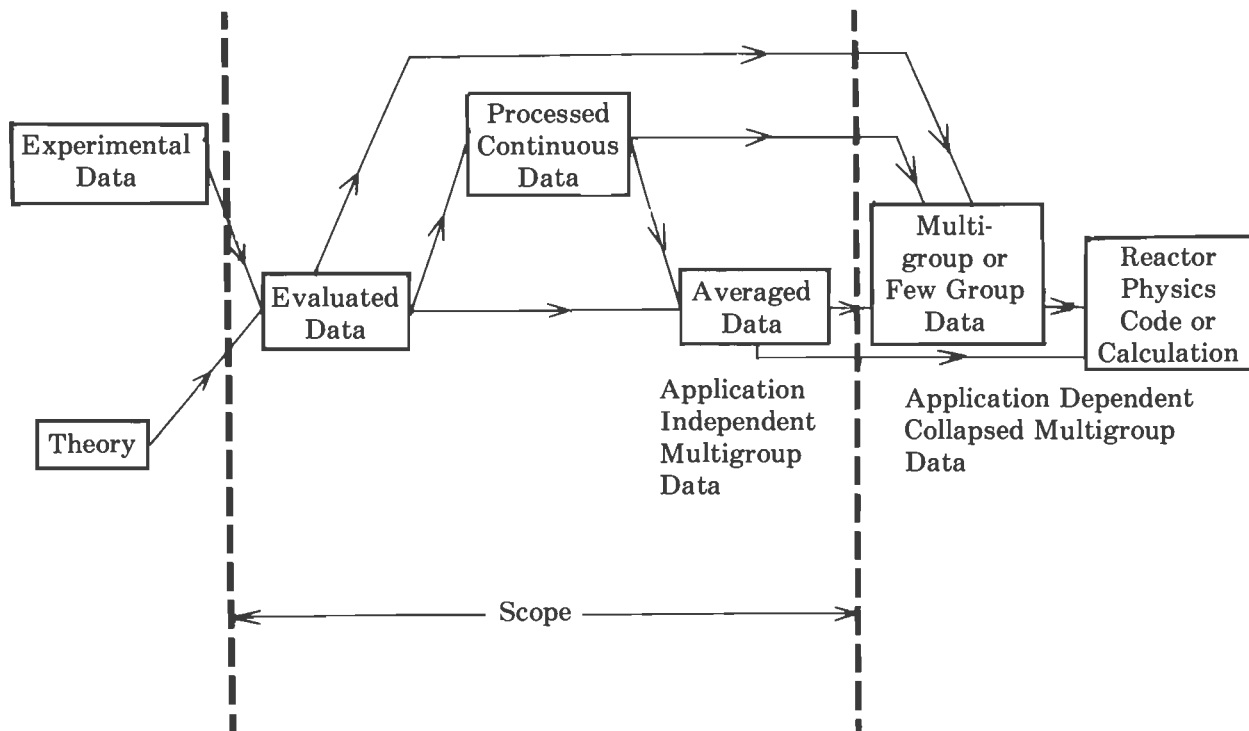


Fig. 1

Schematic Representation of Scope