International Atomic Energy Agency

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INDC INTERNATIONAL NUCLEAR DATA COMMITTEE

USSR State Committee on the Utilization of Atomic Energy
Nuclear Data Centre

NUCLEAR CONSTANTS

No. 8

PROVIDING NUCLEAR DATA FOR FAST REACTOR CALCULATIONS

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Part 4

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Issue No. 8 of "Nuclear Constants" consists of four volumes containing reports on work performed at the Institute of Physics and Power Engineering of the USSR State Committee on the Utilization of Atomic Energy in 1969 and 1970. The purpose of this work was to provide constants for neutron calculations relating to fast reactors and radiation shielding.

The fourth volume (part) describes the format of the evaluated nuclear data in the computer library of the System for Providing Atomic Reactor Calculation Programmes with Nuclear Constants (abbreviated to SOKRATOR). The format was designed with the help of experience gained in setting up similar libraries abroad (the UKNDL, ENDF/B and KEDAK libraries) and in the light of new stored information requirements that have arisen in connection with the improvement of methods for taking resonance and other physical effects into account in reactor calculations.

A description is given of the methods, algorithms and programmes used for checking information entered in the SOKRATOR library, i.e. a complex of programmes, known as "POSOSHOK", for the detection of random errors.

The last two articles of the volume are devoted to the problem of the applicability of multigroup constant systems for accurate shielding calculations. It is suggested that the sub-group approach be used for describing non-scattered radiation in shielding. In many cases this approach permits a substantial increase in the accuracy of calculation of a large part of the calculation programme.

The accuracy with which the passage of neutrons through dense shielding layers can be described with the help of a 26-group system of constants is analysed. The analysis is conducted by comparing the results of calculations carried out in various approximations, and by comparing these with experimental data.

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