as input, arbitrary sets of values of group energies, temperatures, and σ_0's.

5. Restriction on Complexity: ETOX uses random access drum storage to make maximum use of core.

6. Running Time: Twenty-six group data for a representative set of 14 isotopes requires ~28 min on the UNIVAC 1108.

7. Related and Auxiliary Programs: The format of the input data is compatible with the ENDF/B data tape. The format of the output is compatible for input to the computer codes 1DX[3] and FCC-IV[8], which are multipurpose diffusion codes for generating cross sections to be used in fast-reactor analysis.

8. Status: In use at Battelle Northwest.

9. Machine Requirements: A 65K memory, 3 tape units, and random access drum storage.

10. Material Available: A source deck, sample problem, and operation instructions are available from the authors.

11. Acknowledgment: This paper is based on work performed under United States Atomic Energy Commission Contract AT(45-1)-1830.

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1DX

A One-Dimensional Cross Section Generating Code

1. Name of Code: 1DX.[1]

2. Computer for Which Code is Designed: UNIVAC 1108. Programming Language: FORTRAN-IV.

3. Nature of Code: 1DX is a multipurpose, one-dimensional diffusion code for generating cross sections to be used in fast-reactor analyses. The code is designed to:

   a. compute and punch resonance shielded cross sections using data in the "Russian"[2] format

   b. compute and punch group-collapsed microscopic and/or macroscopic cross sections averaged over the spectrum in any specified zone

   c. compute k_{eff} and perform criticality searches on time absorption, material concentrations, zone dimensions, and buckling using either a flux or an adjoint model.

4. Method of Solution: Resonance shielded cross sections are calculated using data (infinite dilution cross sections and resonance shielding factors) in the Russian format. Interpolation schemes are used to compute shielding factors applicable to specific compositions. A flux iteration option for computing the elastic-removal cross section is also included. Group-collapsed cross sections by reactor zone are calculated using flux weighting.

   The eigenvalue and spatial flux profiles are computed using standard source-iteration techniques. Convergence is accelerated using fission source over-relaxation. 1DX will also accept input cross sections in the "DTF" format (i.e., resonance-shielded cross sections).

5. Restrictions on Complexity: 1DX uses variable dimensioning to make maximum use of existing core storage. All subscripted variables are stored in one array dimensioned to 25 000.

6. Running Time: A representative 26-group problem with 30 spatial intervals using data in the Russian format requires ~40 sec on a UNIVAC 1108. If the cross-section data is in the "DTF" format, the same problem would require ~5 sec.

7. Related and Auxiliary Programs: The format of the input data (e.g., flux dumps, geometry, and composition specifications, etc.) is compatible with Los Alamos one- and two-dimensional transport codes DTF-IV[3] and 2DF[4], the BNW two-dimensional burnup code 2DB[5], and the BNW perturbation code PERT-V.[6] The computer code ETOX[7] will prepare cross-section data in the Russian format from the ENDF/B data tape.

8. Status: In use.

9. Machine Requirements: A 65 K memory and seven peripheral storage devices.

10. Material Available: A source deck, sample problem, and operation instructions are available from the authors.

11. Acknowledgment: This paper is based on work performed under U.S. Atomic Energy Commission Contract AT(45-1)-1830.

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NØWIG

1. Name of Code: NØWIG[1]
2. Computer for Which Program is Designed and Programming Language Used: Written for CDC-6600 in FORTRAN IV.
3. Nature of Physical Problem Solved: NØWIG is a program for solving the one-dimensional two-group neutron diffusion and delayed precursor equations using a shape-specified, fixed flux ratio, point kinetics approximation. Feedback due to changes in the fuel metal temperature and coolant density is accounted for using a model which is identical with that used in the WIGL2[2] program.
4. Method of Solution: The appropriate kinetics and temperature equations are solved by a specified theta time differencing technique.
5. Restrictions on Complexity of the Problem: Two energy groups must be used and up to six groups of delayed neutron precursors may be used. The maximum number of spatial mesh points is 250 and up to 20 material compositions and 50 thermal-hydraulic channels may be specified.
6. Related and Auxiliary Programs: The initial conditions required for a NØWIG problem may be generated by use of the steady-state option of the WIGL3 program.[3] The WANDA[4] program may also be used to generate the initial NØWIG shape functions and adjoint weight functions.
7. Running Time: A transient problem with 31 spatial mesh points, 7 t.h. channels, one delayed group and 2000 time steps required 39 sec of computation time on a CDC-6600 computer.
8. Unusual Features: For the class of problems considered, NØWIG solves the same problem (using the same techniques) as the WIGL2[2] program, except that the assumption is made that the flux shape does not change during the transient time of interest. Hence, in the case where the true flux shape (and flux ratio) does not change, the NØWIG and WIGL2 solutions will be identical. This feature will permit the evaluation of shape change effects during transient conditions by means of NØWIG-WIGL2 comparisons.
9. Status: The program is in production and is available through the Argonne Code Center.
10. Machine Requirements: The program was written for a CDC-6600. Associated hardware is described in Ref. 5.
11. Operating System: The appropriate software and hardware associated with the system for which this program was written is contained in Ref. 5. This program was constructed within the SCOPE 3.1 operating system.
12. Other Programming or Operating Information or Restrictions: None.
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