by changing individual cross sections, rearranging compositions, or moving an interface between regions. An option is available to neglect the prompt-neutron lifetime (prompt-jump approximation). The code does not permit a time-dependent, externally specified neutron source.

7. Running Time: A 2-group, 240 mesh point calculation with 6 delayed-neutron groups took 24 sec for the eigenvalue problem and 16 time steps.

8. Status: Production. The FORTRAN source deck is available. However, the user must supply his own matrix inversion subroutine.

9. *References:*

[1]C. H. ADAMS and W. M. STACEY, Jr., "RAUMZEIT—A Program to Solve Coupled Time-Dependent Neutron Diffusion Equations in One Space Dimension," KAPL-M-6728 (CHA-WMS-1), Knolls Atomic Power Laboratory (July 1967).

[2]W. M. STACEY, Jr. and C. H. ADAMS, "The Time-Integrated Method: A Quasi-Static Neutron Space-Time Approximation," *Trans. Am. Nucl. Soc.*, **10**, 261 (1967).

[3]F. D. FEDERIGHI, "RAUM—Solution of One-Dimensional Coupled Diffusion—Type Equations on the Philco-2000," KAPL-M-FDF-1, Knolls Atomic Power Laboratory (February 1962).

C. H. Adams
W. M. Stacey, Jr.

Knolls Atomic Power Laboratory*
Schenectady, New York 12301

Received October 30, 1967

*Operated by the General Electric Company for the USAEC.

M0899

1. Name or Designation of Program: M0899, A Digital Computer Program for Nuclear Reactor Design Water Properties.[1]

2. Computer for Which Program is Designed and Programming Language Used: Written for the CDC-6600 in FORTRAN IV. However, it uses the INP routines for input,[2] which requires the equivalencing of real and integer arrays and a routine for packing and unpacking words. Input is very minimal so that FORTRAN formatted input could easily be used as a replacement.

3. Nature of Physical Problem Solved: By making calls on a subroutine called HOH, M0899 edits thermodynamic and transport properties of water over the range (14.5 to 2538 psia and up to 608 F deg below saturation and 932 F deg above saturation). All data are taken from Ref. 3.

4. Method of Solution: The thermodynamic data are stored as tables and values are obtained by bilinear interpolation in pressure and temperature.

5. Related and Auxiliary Programs: M0899 is an extension of subroutine HOH. It makes calls on HOH to get properties for pressure and temperatures supplied and then edits the properties. HOH can be used apart from M0899 by any other FORTRAN IV program to obtain water properties.

6. Typical Running Time: Less than one minute.

7. Unusual Features of the Program: Only 800 entries are required for the thermodynamic tables of enthalpy and specific volumes to get values that lie within the experimental tolerances.

8. Status: In production and may be obtained by domestic users from the Argonne Code Center.

9. Machine Requirements: A FORTRAN IV compiler plus about 3000 locations for subroutine HOH and 10 000 locations for the main program.

10. Operating System or Monitor Under Which Program is Executed: M0899 operates under the SCOPE 2.0 system. It requires the FCHIP, CARDS, and INP routines described by Pfeifer.[2]

11. *References*:

[1]L. L. LYNN, "A Digital Computer Program for Nuclear Reactor Design Water Properties," WAPD-TM-680, Bettis Atomic Power Laboratory (1967).

[2]C. J. PFEIFER, "CDC-6600 FORTRAN Programming—Bettis Environmental Report," WAPD-TM-668, Bettis Atomic Power Laboratory (1967).

[3]*National Engineering Laboratory Steam Tables*, prepared by R. W. BAIN, Her Majesty's Stationery Office, Edinburgh (1964).

L. L. Lynn

Westinghouse Electric Corporation
Bettis Atomic Power Laboratory
P.O. Box 79
West Mifflin, Pennsylvania 15122

Received November 8, 1967