



# RSIC Newsletter

**OAK RIDGE NATIONAL LABORATORY**  
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*The best use of life is to invest it in something which will outlast life.—William James*

## ANS UPDATE

The following items summarize events and activities of possible interest to RSIC participants which took place at the June 1984 meeting of the American Nuclear Society (ANS) in New Orleans, Louisiana.

### Election Results

As the vice president/president-elect of 1983, **Joseph M. Hendrie**, Brookhaven National Laboratory, automatically assumed the presidency for 1984-85. **John Graham**, Rockwell International, continued as Treasurer.

The challenge of **Betty F. Maskewitz** to **E. Linn Draper, Jr.** for the office of vice president/president-elect of the society provided a change in the otherwise routine proceedings. The Maskewitz nomination marks the first time in ANS history that the nominating committee choice was challenged by a member drafted by a petition from the general membership, and it was the first nomination of a woman for the second highest post in the ANS.

It was with "a sigh of relief," that RSIC's Maskewitz conceded the election to Draper of Gulf States Utilities Company.

Nine board members were elected or re-elected to three-year terms. The eight U.S. directors-at-large are: *Spencer H. Bush*, Review & Synthesis Associates; *Michael R. Fox*, Rockwell Hanford Operations; *E. Gail de Planque*, U.S. Dept. of Energy;

*Charles F. Jones*, NUS Corp.; *Wilson D. Leggett, III*, Westinghouse Electric Corp.; *M. Jack Ohanian*, University of Florida; *Enzo Ricci*, Martin Marietta Energy Systems, Inc.; and *Sherwood H. Smith, Jr.*, Carolina Power and Light Co. The non-U.S. board member-at-large is *Ryohei Kiyose*.

### Professional Divisions

The following newly elected division and technical group officers for 1984-85 took office at the conclusion of their respective division meetings during the ANS Annual Meeting in New Orleans. The vice chair/chair-elect of the 1983 elections assumed the office of chairman. Due to space limitations, only those divisions deemed to be of interest to RSIC participants are listed here.

**Fusion Energy Chair**, *Dale A. DeFreece*; vice chair/chair-elect, *Stephen O. Dean*; secretary/treasurer, *Thomas E. Shannon*; vice program chair/chair-elect, *Carl D. Henning*; executive committee, *Donald L. Cook*, *Bernard A. Engholm* and *James D. Gordon*.

**Mathematics and Computation Chair**, *Michael V. Gregory*; vice chair/chair-elect, *Elmer E. Lewis*; secretary, *Paul Nelson*; treasurer, *Raymond E. Alcouffe*; executive committee, *Laural L. Briggs*, *Edward W. Larsen*, and *David P. Weber*.

**Radiation Protection and Shielding Chair**, *Stephen E. Binney*; vice chair/chair-elect, *Richard K. Disney*; secretary/treasurer, *Nick Tsoulfanidis*; executive committee, *Herbert Goldstein*, *Keran O'Brien*, and *Dave K. Trubey*.

**Reactor Physics Chair, Rudolph Sher;** vice chair/ chair-elect, *Leo G. LeSage*; secretary, *Veikko O. Uotinen*; treasurer, *David J. Diamond*; executive committee, *Paul W. Dickson, Jr., Richard A. Harris,* and *Harold F. McFarlane.*

### **Chilton Receives Compton Award**

The ANS *Arthur Holly Compton Award* for outstanding contributions in nuclear science and engineering education was presented to **Dr. Arthur B. Chilton** at a luncheon during the ANS Annual Meeting in New Orleans. Dr. Chilton, a professor in nuclear and civil engineering at the University of Illinois, was awarded a certificate and \$1,000 "for his leadership in teaching and research in radiation protection. His high standards and devotion to excellence through teaching, professional society activities, academic administration, and counseling have benefited and inspired students and colleagues alike."

The Compton Award, presented since 1967, is named after the late Dr. Arthur Holly Compton, a scientist associated with the early development of nuclear fission.

### **Santoro Awarded Citation**

**Robert T. Santoro** was one of 15 ANS members honored with the rank of Fellow. Santoro, a research physicist in the Applied Physics and Fu-

sion Research Analysis group of the Engineering Physics and Mathematics Division at Oak Ridge National Laboratory, was cited "For the many advancements he has made in the state-of-the-art of the design of blanket-shield assemblies for fusion reactors. Also, for his earlier pioneering work in the design of shielding for manned spacecraft and high-energy accelerators and for the many contributions he has made in the field of neutron and charged particle cancer radiotherapy."

## **CHANGES TO THE COMPUTER CODES COLLECTION**

During the month an existing code package was expanded with the addition of new hardware versions, and a new code system with several hardware versions was packaged.

### **CCC-428/ONEDANT**

Los Alamos National Laboratory (LANL), Los Alamos, New Mexico, contributed CDC (A) and VAX (C) versions and Argonne National Laboratory (ANL), Argonne, Illinois, contributed an IBM (B) version of this one-dimensional, multigroup diffusion-accelerated, transport code system. The CDC version is a newly frozen version and replaces the existing version in the RSIC collection. The IBM and VAX versions had not previously existed in the RSIC collection. For both versions, the input module is now compatible with ONEDANT and TWODANT (CCC-456). The user can now combine modules from those codes to make a 1D/2D code system. Current users of ONEDANT who do not wish to combine it with TWODANT need not request the new version. The new versions fea-

ture a faster vectorized form (in Subroutine INNER), but it is still diamond difference in method with the same negative fix-up scheme. Minor changes in format were made and some edit options added as well as cross-section balancing on self scatter in input. Reference: LA-9184-M. FORTRAN IV; CDC (A) and IBM (B).

### **CCC-456/TWODANT**

The CDC 7600 (A) version of this two-dimensional, discrete-ordinates multigroup transport code package and the VAX (C) version are contributions of LANL. The IBM (B) version is a contribution of ANL. The code solves the two-dimensional multigroup transport equation in x,y and r,z geometries. Both regular and adjoint inhomogeneous (fixed source) and homogeneous (k-effective) problems subject to vacuum, reflective, periodic or white boundary conditions are solved. General anisotropic scattering is allowed and anisotropic inhomogeneous sources are permitted. It can be combined to do 1D/2D calculations. Reference: LA-10049-M. FORTRAN IV; CDC 7600 (A), IBM 370 (B) and VAX (C).

### **Shielding Standards News**

The following information is taken from *Nuclear Standards News* and lists shielding standards requiring comment, approved, and published.

### **Comment**

BSR/ANS-6.4.2 *Specification for Radiation Shielding Materials* (new standard) order from ANS, \$7.50.

This standard sets forth physical and nuclear properties that shall be reported by the supplier as appropriate for a particular application in order to form the basis for the selection of radiation shielding materials.

#### Approved

ANSI N319-1976(R1984) *Personnel Neutron Dosimeters (Neutron Energies Less Than 20 MeV)* (reaffirmation); date, May 1, 1984.

ANSI N343-1978(R1984) *Internal Dosimetry for Mixed Fission and Activation Products* (reaffirmation); date, May 1, 1984.

#### Published

IEC 333-1983 *Test Procedures for Semiconductor Charged-Particle Detectors*, \$15.00. Order from ANSI, Attn: Sales Dept.

#### NCRP

The National Council on Radiation Protection and Measurements (NCRP) has published the following new reports, available from NCRP Publications, 7910 Woodmont Ave., Suite 1016, Bethesda, Maryland 20814.

NCRP Report No. 72 *Radiation Protection and Measurements for Low Voltage Neutron Generators*—\$10.00,

NCRP Report No. 73 *Protection in Nuclear Medicine and Ultrasound Diagnostic Procedures in Children*—\$10.00, and

NCRP Report No. 74 *Biological Effects of Ultrasound: Mechanisms and Clinical Implications*—\$15.00.

#### German Nuclear Standards

The German Nuclear Standards Committee (NKe), observing its 25th anniversary this year, has announced the availability of the following standards:

DIN V 25 414 *Ventilating Systems in Nuclear Power Plants*,

DIN 25 417, Part 2 *General Requirements for Electrical Power Supply to Safety Systems for Nuclear Power Generating Stations; Multiple Unit Stations, Safety Requirements*,

DIN V 25 449 *Design Criteria for Structure Concrete Against Loadings Due to Inner Accident Condition in Nuclear Power Plants*,

DIN 25 456, Part 1 *Neutron Fluence Measurement; Fluence Determination of Fast Neutrons with Activation and Fission Detectors*,

DIN 25 467, Part 2 *Emergency Generating Stations with Diesel Engine in Nuclear Power Stations; Tests; Safety Requirements*,

DIN 25 475, Part 1 *Nuclear Facilities; Surveillance*

*Systems, Monitoring of Structure Born Sound for Loose Parts Detection*,

DIN 25 403, Part 8 *Criticality Safety in Processing and Handling of Fissile Materials; Criticality Data of Uranyl-Nitrate (100% Uranium 235) Light Water Mixture*

DIN 25 416, Part 2 *Facilities for Treatment for Radioactive Contaminated Water in Nuclear Power Plants; Methods*

DIN 25 463, Supp. 1 *Decay Heat Power in Nuclear Fuels of Light Water Reactors; Documentation and Illustration*.

Four draft standards were developed during the year and a newly revised fourth edition of the DIN/CEC, Nuclear Standards—Catalog and Classification, by N. Fichtner, K. Becker, and M. Bashir. All are available from Beuth Verlag, Burggrafenstr. 4-10, D-1000 Berlin 30.

#### ISO

The International Standards Organization (ISO), Technical Committee 85, (Nuclear Energy) has announced the publication of the following international standards, which may be obtained from ANSI, Attn: Sales Dept.

ISO 4037 Amendment 1 and Addendum 1—*X and Gamma Reference Radiations for Calibrating Dosimeters and Dose Ratemeters and for Determining their Response as a Function of Photon Energy*

ISO 7097 *Determination of Uranium in Reactor Fuel Solutions and in Uranium Product Solutions—Iron(II) Sulfate Reduction/Potassium Dichromate Oxidation Titrimetric Method and*

ISO 7385 *Nuclear Power Plants—Guidelines to Ensure Quality of Collected Data on Reliability*

#### PERSONAL ITEMS

In serving a specialized area of scientific endeavor, it seems important that we take note of the movement of people concerned with radiation protection, transport, and shielding in the nuclear industry. We, therefore, continue to carry personal items as they are brought to our attention. During the past month we have been informed of the following changes. *John Anselmo*, has left Science Applications, Inc., to join Mission Research Corporation in Santa Barbara, California; *Mary Ann Capo*, has retired from Westinghouse Electric Corp., in Jacksonville, Florida, and returned to Pittsburgh, Pennsylvania, where she intends to do some consulting work; *Alan Dooley*, has transferred from the Air Force Inst. of Technology in Dayton, Ohio, to the Air Force Weapons Laboratory in Albuquerque, New Mexico; and *Naoki Yamano*, has moved from Japan Atomic Energy Research Institute to Nuclear Fuel Industries, Ltd., in Osaka.

### Visitors to RSIC

During the month the following persons came for an orientation visit and/or to use RSIC facilities: *Arthur B.*

*Chilton*, from the University of Illinois; *Delia E. Sartori*, from NUCOR, South Africa; *R. J. McElroy*, from AERE Harwell, United Kingdom; and *Sun-Tae Hwang*, from the Korea Standards Research Institute, Chung Nam, Korea.

### UPCOMING CONFERENCES, SYMPOSIA, AND COURSES

Your attention is directed to the following events of interest to the radiation shielding and protection community.

#### Space Nuclear Power Safety Short Course

The Institute for Space Nuclear Power Studies at the University of New Mexico is sponsoring *Space Nuclear Power Safety*, August 13-17, 1984, in Albuquerque. The specialized graduate level course will cover the state of the art in space nuclear power safety. The instructors will be Patrick McDaniel, Sandia National Laboratory, and James Lee, Jr., Air Force Weapons Laboratory. Further information may be obtained from Glenn A. Whan or Mohamed S. El-Genk, Chemical & Nuclear Engr. Dept., Univ. of New Mexico, Albuquerque, NM 87131 (phone 505-277-5431/5442).

#### UT Fusion Energy Short Course

The University of Tennessee College of Engineering is sponsoring *Fusion Energy—The Physics and Technology of Magnetic Fusion Energy* to be held September 10-14, 1984. The course will provide a broad overview of magnetic fusion research to engineers, planners, managers, and educators who wish to become aware of the issues and impact of the U.S. Fusion Program. The course will begin with the history, development, and basic concepts of fusion research. Discussions on the fundamental limits on fusion reactors and engineering problems of fusion research will provide the background for a survey of mainline DOE-funded fusion reactor concepts, as well as alternate fusion reactor concepts (Stellarator, RFP, OHTE, and hybrid reactors). The final session of the course will cover public policy issues of fusion energy. The course is designed for working engineers with the usual physics and math courses required for an undergraduate engineering degree.

The registration deadline is August 15, 1984. Further information may be obtained from William T. Snyder, Dean of Engineering, The University of Tennessee, Knoxville, TN 37996-2000 (phone 615-974-5321).

#### WM'85 Issues Call for Papers

The 1985 symposium on **Radioactive Waste Man-**

**agement** (WM'85) has issued a call for papers. WM'85 will be held March 24-28, 1985, in Tucson, Arizona. The conference is part of a continuing series of symposia on waste management held annually since 1974. Cosponsors of the symposium are the Univ. of Arizona, U.S. Dept. of Energy, ANS, Electric Power Research Institute, and the Radwaste Systems Committee of the American Society of Mechanical Engineers.

Those wishing to contribute a paper should submit an abstract by *September 20, 1984*, to the Technical Program Chairman, M. E. Wacks, (602-621-6160) or to the Publications Chairman, J. G. McCray, (602-621-4985), Dept. of Nuclear and Energy Engineering, Univ. of Arizona, Tucson, AZ 85721. The abstract will be reviewed by the Program Advisory Committee for originality, technical content, significance, and subject matter. The authors of papers which are accepted will be notified by November 30, 1984. The completed papers will be due by February 20, 1985. The topics selected for WM'85 are high-level and defense waste disposal, low-level volume reduction, reduction of waste generation, socioeconomic issues, public information, remedial action programs, spent fuel, low-level site development, workshops and general discussions on radioactive and hazardous waste management.

#### Calendar

Your attention is directed to the following additional events of interest to the radiation shielding and protection community.

#### August 1984

*Practical Applications of Ground Water Models*, August 15-17, 1984, Columbus, Ohio. Contact: David M. Nielsen, Conference Coordinator, National Water Well Association, 500 W. Wilson Bridge Rd., Worthington, OH 43085 (phone 614-846-9355).

*Medical Planning and Care in Radiation Accidents*, August 20-24, 1984, Oak Ridge, Tennessee, a course sponsored by the U.S. Department of Energy (DOE). Contact: Robert C. Ricks, REAC/TS, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831 (phone 615-576-3131).

*Occupational and Environmental Radiation Protection*, August 20-24, 1984, Boston, Massachusetts, a course offered by Harvard School of Public Health. Contact: Office of Continuing Education, Harvard School of Public Health, 677 Huntington Ave., Boston, MA 02115 (phone 617-732-1171).

*International Topical Meeting on Fuel Reprocessing and Waste Management*, August 26–29, 1984, Jackson Hole, Wyoming, sponsored by ANS. Contact: L. W. McClure, Technical Program Chairman, P.O. Box 3807, Idaho Falls, ID 83401.

#### September 1984

*Topical Conference on Neutron-Nucleus Collisions: A Probe of Nuclear Structure*, September 5–8, 1984, Glouster, OH 45732 (phone 614-594-6928).

*5th International Symposium on Capture Gamma Ray Spectroscopy and Related Topics*, September 10–14, 1984, Oak Ridge, Tennessee. Contact: S. Raman, Physics Division, ORNL, P.O. Box X, Oak Ridge, Tennessee 37831-2008 USA.

*International Meeting on Thermal Nuclear Reactor Safety*, September 10–14, 1984, Karlsruhe, Fed. Rep. Germany, sponsored by the European Nuclear Society, ANS, and German Nuclear Technology Society. Contact: H. Rininsland, Kernforschungszentrum Karlsruhe GmbH, Postfach 3640, D-7500 Karlsruhe, F. R. Germany.

*Handling of Radiation Accidents by Emergency Personnel*, September 11–14, 1984, a course sponsored by the DOE. Contact: Robert C. Ricks, REAC/TS, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831 (phone 615-576-3131).

*10th International Conference of Plasma Physics and Controlled Nuclear Fusion Research*, September 12–19, 1984, London, United Kingdom, sponsored by the IAEA. Contact: IAEA, P.O. Box 100, Vienna International Centre, A-1400 Vienna, Austria.

*ANS Topical Meeting on Physics and Shielding*, September 17–19, 1984, Chicago, Illinois. Contact: Leo LeSage, Argonne National Laboratory, Applied Physics Div., 9700 South Cass Ave., Argonne, Illinois 60439 USA (phone 312-972-6045).

*Health Physics in Radiation Accidents*, September 17–21, 1984, a course sponsored by the DOE. Contact: Robert C. Ricks, REAC/TS, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831 (phone 615-576-3131).

*5th ASTM-EURATOM Symposium on Reactor Dosimetry*, September 24–28, 1984, Geesthacht, Fed. Rep. of Germany, sponsored by Commission of the European Communities, ASTM, U.S.-DOE, and U.S.-NRC. Contact: E. B. Norris, Southwest Research Institute, P.O. Drawer 28510, San Antonio, Texas 78284 (for Japanese and US authors); H. Röttger, Joint Research Centre, Petten Establishment, HFR Div., Postbus 2, 1755 ZG Petten (N. H.), Netherlands (all other authors).

*13th Symposium on Fusion Technology*, September 24–28, 1984, Varese, Italy. Contact: 13th SOFT, Joint Research Centre, Ispra Establishment, I-21020 Ispra, Varese, Italy (phone 0332-789988/780131).

#### October 1984

*Conference on Radiation Protection: Standards and Regulatory Issues*, October 7–10, 1984, Orlando, Florida, sponsored by Atomic Industrial Forum. Contact: Conference Office, Atomic Industrial Forum, Inc., 7101 Wisconsin Ave., Bethesda, Maryland 20814 (phone 301-654-9260).

*International Symposium on High-Dose Dosimetry*, October 8–12, 1984, Vienna, Austria, sponsored by the IAEA. Contact: Conference Service Section, IAEA, P.O. Box 100, A-1400, Vienna, Austria.

*International Conference on Nuclear and Radiochemistry*, October 8–12, 1984, Lindau, Bodensee, F. R. Germany. Con-

tact: Gesellschaft Deutscher Chemiker, Abt. Tagungsorganisation, Postfach 900440, D-6000 Frankfurt-am-Main 90, F. R. Germany.

*International Conference on Occupational Radiation Safety in Mining*, October 15–18, 1984, Toronto, Ontario, Canada, sponsored by the Canadian Nuclear Assoc., Canadian Dept. of Energy, Mines, and Resources, and the Atomic Energy Control Board. Contact: Internatl. Conf. on Occupational Radiation Safety in Mining, Canadian Nuclear Assoc., 111 Elizabeth St., 11th Floor, Toronto, Ontario, Canada M5G 1P7.

*Symposium on Radiation Dosimetry*, October 15–18, 1984, Knoxville, Tennessee, sponsored by ORNL. Contact: R. T. Greene, ORNL, P.O. Box X, Bldg. 7710, Oak Ridge, TN 37831-2008 USA.

*Meeting of the Nuclear Physics Div. of the American Physical Society*, October 18–20, 1984, Nashville, Tenn. Contact: American Physical Society, 335 E. 45th St., New York, NY 10017 USA.

*Clinical Radiophysics*, a symposium sponsored by the Clinical Radiophysics Section of the Society for Medical Radiology of the German Democratic Republic, October 28–November 1, 1984, Binz (island Rügen, German Democratic Republic). Contact: Dr. sc. techn. Manfred Tautz, 1115 Berlin-Buch, Wiltbergstrasse 50, Städtisches Klinikum Buch, Spezialabteilung Strahlenphysik, German Democratic Republic.

*International Symposium on the Implementation of the IAEA Codes of Practice and Safety Guides for Nuclear Power Plants*, October 29–November 2, 1984. Contact: Conf. Svc. Sect., IAEA, P.O. Box 100, A-1400 Vienna, Austria.

*Nuclear Power Systems Symposium*, October 31–November 2, 1984, Orlando, Florida, sponsored by the Institute of Electrical and Electronics Engineers. Contact: D. Louis Costrell, National Bureau of Standards, C333 Radiation Physics, Washington, DC 20234 (phone 301-921-2518).

*Nuclear Science Symposium*, October 31–November 2, 1984, Orlando, Florida. Contact: L. C. Oakes, Oak Ridge National Lab., P.O. Box X, Oak Ridge, TN 37831 (phone 615-574-5527).

#### November 1984

*National Conference on Biomedical Physics and Engineering* November 3–4, 1984, in Sofia, Bulgaria, sponsored by the Bulgarian National Society of Biomedical Physics and Engineering. Contact: Chair of Physics and Biophysics, c/o eng. Peter Trindev, Medical Academy - Base No. 1, 1431 Sofia / 1 Boul. G. Sofiiski, Bulgaria.

*Inter-Regional Seminar on Practical Problems Encountered in the Safe Transport of Radioactive Materials*, November 5–8, 1984, Vienna. Contact: Conf. Svc. Sect., IAEA, P.O. Box 100, A-1400 Vienna, Austria.

*Joint Meeting of the American Nuclear Society, the Atomic Industrial Forum, and the European Nuclear Society*, November 11–16, 1984, Washington. Contact: George W. Cunningham, Nuclear Studies, Mitre Corp., 1820 Dolley Madison Blvd., McLean, Virginia 22102 USA.

*8th Conference on the Applications of Accelerators in Research and Industry*, November 12–14, 1984, Denton, Texas, sponsored by North Texas State University. Contact: Accelerator Conference, Physics Dept., North Texas State Univ., Box 5368, Denton, TX 76203-5368.

*International Conference on Power Plant Simulation*, November 19–21, 1984, Cuernavaca, Mexico, sponsored by the

Instituto de Investigaciones Eléctricas, Mexico, with the sponsorship of the Nuclear Regulatory Commission (NRC). Contact: for USA and Canada; David Hetrick, Dept. of Nuclear and Energy Engineering, Univ. of Arizona, Tucson, AZ 85721; and for other countries, Dra. elia Méndez, Instituto de Investigaciones Eléctricas, Depto. de Simulación, Leibnitz 14, 3er piso, Co. Anzures, 11590, Mexico, D. F.

*International Conference on Fusion Reactor Materials*, November 19–22, 1984, Tokyo, Japan, sponsored by the Atomic Energy Society of Japan, Iron and Steel Institute of Japan, Ja-

pan Institute of Metals, and Japan Society of Applied Physics. Contact: R. R. Hasiguti, Science Univ. of Tokyo, Faculty of Engineering, Kagurazaka, Shinjuku-ku, Tokyo 162 Japan.

*International Symposium on Assessment of Radioactive Contamination in Man*, November 19–23, 1984, Paris, sponsored by the International Atomic Energy Agency. Contact: Conf. Svc. Sect., IAEA, P.O. Box 100, A-1400 Vienna, Austria.

*Conference on Radioactive Waste Management*, November 27–29, 1984, London, sponsored by the British Nuclear Energy Society. Contact: The Secretariat, British Nuclear Energy Society, at the Institution of Civil Engineers, 1-7 Great George St., London SW1P 3AA, UK.

## JUNE ACCESSION OF LITERATURE

The following literature cited has been ordered for review, and that selected as suitable will be placed in the RSIC Information Storage and Retrieval Information System (SARIS). This early announcement is made as a service to the shielding community. Copies of the literature are not distributed by RSIC. They may generally be obtained from the author or from a documentation center such as the National Technical Information Service (NTIS), Department of Commerce, Springfield, Virginia 22161.

*RSIC maintains a microfiche file of the literature entered into SARIS, and duplicate copies of out-of-print reports may be available on request. Naturally, we cannot fill requests for literature which is copyrighted (such as books or journal articles) or whose distribution is restricted.*

**This Literature is on order. It is not in our system. Please order from NTIS or other available source as indicated.**

### RADIATION SHIELDING LITERATURE

**AECEB-1180-2**, . . *Basis for Limiting Exposure to Ionizing Radiation*, . . Bush, W.R., . . July 1979, . . NTIS (U.S. Sales Only), PC A03/MF A01

**AECL-7759**, . . *Radiation Fluxes and Currents over a Plane, Circular Aperture Due to Direct Contributions from a Plane, Circular Source*, . . Kushneriuk, S.A.; Lone, M.A., . . June 1982, . . Scientific Document Distribution Office, Atomic Energy of Canada Limited, Chalk River, Ontario, Canada K0J 1J0 Price \$3.00 per copy

**AECL-7839**, . . *Characteristics of a Thermal Neutron Source Based on an Intermediate Energy Proton Accelerator*, . . Lone, M.A.; Selander, W.N.; Townes, B.M.; Latouf, J.; Svensson, E.C.; Bartholomew, G.A., . . March 1983, . . Scientific Document Distribution Office, Atomic Energy of Canada Limited, Chalk River, Ontario, Canada K0J 1J0 Price \$4.00 per copy

**AECL-8058**, . . *Collisions of Neutrons and of Gamma Rays in  $Bi_4Ge_3O_{12}$  (BGO) and NaI(Tl) Scintillation Detectors*, . . Kushneriuk, S.A.; Lone, M.A.; Hausser, O.; Wong, P.Y., . . June 1983, . . Scientific Document Distribution Office, Atomic Energy of Canada Limited, Chalk River, Ontario, Canada K0J 1J0 Price \$4.00 per copy

**ANSI/ANS-6.4-1977**, . . *American National Standard: Guidelines on the Nuclear Analysis and Design of Concrete Radiation Shielding for Nuclear Power Plants*, . . American Nuclear Society, La Grange Park, IL, . . August 8, 1977, . . American Nuclear Society, 555 North Kensington Ave., La Grange Park, IL 60525 \$38.00

**ANSI/ANS-10.2-1982**, . . *American National Standard: Recommended Programming Practices to Facilitate the Portability of Scientific-Computer Programs*, . . American Nuclear Society, La Grange Park, IL, . . March 1982, . . American Nuclear Society, 555 North Kensington Ave., La Grange Park, IL 60525

**BNL-33792; CONF-8104228-1**, . . *Conceptual Basis for Evaluating Risk from Low-Level Radiation Exposure*, . . Bond, V.P., . . 1981, . . NTIS, PC A03/MF A01

**BNL-NUREG-33989; CONF-8310143-72**, . . *Independent Assessment of TRAC and RELAP5 Codes Through Separate Effects Tests*, . . Saha, P.; Rohatgi, U.S.; Jo, J.H.; Neymotin, L.; Slovik, G.; Yuelys-Miksis, C.; Pu, J., . . 1983, . . NTIS, PC A02/MF A01; GPO

- CEA-CONF-6700; CONF-830444-5**, . . *Fast Fission Phenomena*, . . Ngo, C., . . April 1983, . . NTIS (U.S. Sales Only), PC A02/MF A01
- CEA-CONF-6727 (In French); CONF-830580-4 (In French)**, . . *Gamma Irradiation up to  $10^9$  Rads of All Silica Fibers, Comparison with Polymer Clad Silica Fibers, and Solid Sample Between 0.4 and 2.5 Micrometers*, . . Boisdé, G.; Bonnejean, C.; Perez, J.J.; Neumann, V.; Wurrier, B.; Boucher, D., . . May 1983, . . NTIS (U.S. Sales Only), PC A02/MF A01
- CEA-CONF-6736 (In French); CONF-830942-36 (In French)**, . . *Nuclear Data Fitting from Specific Integral Experiments for Structural Materials*, . . Trapp, J.P., . . September 1982, . . NTIS (U.S. Sales Only), PC A02/MF A01
- CEA-CONF-6737 (In French); CONF-830942-37 (In French)**, . . *Evaluation of  $^{231}\text{Np}$  Neutron Cross Sections Between 5 and 16 MeV. Study of the  $(n,2n)$  Reaction and Application to  $^{236}\text{Pu}$  Production Calculations*, . . Fort, E.; Derrien, H.; Doat, J.P., . . September 1982, . . NTIS (U.S. Sales Only), PC A02/MF A01
- CEA-CONF-6741; DRNR-P-247; CONF-8209199-1**, . . *Group Collapsing Strategy for 3D Design Calculations*, . . Cosimi, M.; Giacometti, C.; Palmiotti, G.; Salvatores, M., . . September 1982, . . NTIS (U.S. Sales Only), PC A02/MF A01
- CEA-CONF-6818 (In French); CONF-8309186-1 (In French)**, . . *Neutron Transport Calculations*, . . Reuss, P., . . CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France), . . September 1983, . . NTIS (U.S. Sales Only), PC A02/MF A01
- CEA-CONF-6847; CONF-8306152-1**, . . *Solid Breeder Blanket Concepts*, . . Chevereau, G., . . CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France), . . June 1983, . . NTIS (U.S. Sales Only), PC A02/MF A01
- CEA-CONF-6848; CONF-8306152-2**, . . *Fusion Reactor Blanket Neutronic Studies in France*, . . Barre, F.; Gervaise, L.; Giancarli, L., . . June 1983, . . NTIS (U.S. Sales Only), PC A02/MF A01
- CEA-N-2358 (In French)**, . . *Theoretical Study of Some Nodal Methods for the Solution of the Diffusion Equation. Numerical Tests*, . . Fedon-Magnaud, C., . . August 1983, . . NTIS (U.S. Sales Only), PC A06/MF A01
- CEA-R-5234 (In French)**, . . *Measurement of Absorbed Doses in Homogeneous Beta Rays Fields with an Extrapolation Chamber*, . . CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France), . . July 1983, . . NTIS (U.S. Sales Only), PC A05/MF A01
- CONF-821148-4**, . . *Space Reactor Shielding: An Assessment of the Technology*, . . Bartine, D.E.; Engle, W.W., Jr., . . 1982, . . NTIS, PC A03/MF A01
- CONF-830942-66**, . . *Copper and Copper Alloys for Fusion Reactor Applications: Summary Report of a DOE-OFE Workshop*, . . Wiffen, F.W.; Reuther, T.C.; Gold, R.E., . . 1983, . . NTIS, PC A02/MF A01
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