



nuclear technology

EDITOR

ROY G. POST
Department of Nuclear Engineering
University of Arizona,
Tucson, Arizona 85721

ANS OFFICERS

JOHN W. SIMPSON, *President*
J. ERNEST WILKINS, Jr.,
Vice President-President Elect
HARRY LAWROSKI, *Treasurer*
RAYMOND D. MAXSON, *Assistant Treasurer*
OCTAVE J. DU TEMPLE, *Executive Director*

ANS STAFF

NORMAN H. JACOBSON, *Publications Manager*
RUTH FARMAKES, *Assistant Staff Editor*
BARRETT M. SCHROEDER, *Copy Editor*
SIEGFRIED H. KRAPP, *Production Manager*
KATHRYN L. FROELICH, *Production Assistant*
MERRILL ALBERTUS, *Production Coordinator*

Advertising

RICHARD HARRIS, *Advertising Sales Manager*
ROSEMARY HARVEY, *Circulation Manager*

EDITORIAL ADVISORY BOARD

SPENCER H. BUSH, ERIC T. CLARKE, VAUGHN E. CULLER, GARY J. DAU, W. KENNETH DAVIS, MILTON C. EDLUND, WALTER H. ESSELMAN, PAUL R. FIELDS, JOHN H. FRYE, JR., STEPHEN J. GAGE, O. H. GREAGER, MARSHALL GROTEHUIS, VINCENT P. GUINN, DAVID B. HALL, DANIEL F. HANG, JOSEPH M. HENDRIE, PAUL KRUGER, STEPHEN LAWROSKI, FORREST J. REMICK, WALTON RODGER, ZOLTON ROSZTOCZY, WILSON TALLEY, EDWIN L. ZEBROSKI

Address all manuscript and editorial communications to the editorial offices, *Nuclear Technology*, Department of Nuclear Engineering, The University of Arizona, Tucson, Arizona 85721.

Nuclear Technology is published monthly by the American Nuclear Society, Inc., with executive and business offices at 244 East Ogden Avenue, Hinsdale, Illinois 60521, telephone 312/325-1991. Subscription rate is \$30 or \$110/four volumes per year. Single copy price is \$13 (special issue slightly higher). It is printed in Danville, Illinois, and second class postage is paid at Hinsdale, Illinois, and at additional mailing offices. Copyright © 1973 by the American Nuclear Society, Inc.

Statements made by authors of contributions to the various departments or of technical papers and notes do not necessarily reflect the viewpoint of the American Nuclear Society nor should their appearance herein be construed as tacit approval or endorsement by the Society. Abstracts in *Nuclear Technology* may be freely republished anywhere at any time.

ON THE COVER:

This month's cover was composed by our artist using parts of photos from the paper by DiStefano and Lin (p. 34) of Oak Ridge National Laboratory.

CONTENTS — JULY 1973

TECHNICAL PAPERS

REACTORS

Thermal Analysis of the Pennsylvania State University Breazeale Nuclear Reactor / *J. A. Haag, S. H. Levine* - - 6

FUEL CYCLES

Criticality Safety Evaluation of a Shipping Container for Moderated Low-Enriched Uranium Compounds / *Ricardo Artigas* - - - - - 16

CHEMICAL PROCESSING

Thermal Considerations and Analysis for a Radioactive Waste Repository / *R. D. Cheverton, W. D. Turner* - - - 21

MATERIALS

Compatibility of Refractory Metals with ²⁴⁴Cm₂O₃ / *J. R. DiStefano, K. H. Lin* - - - - - 34

Monitoring and Measurement of Carbon Activity in Sodium Systems / *K. Natesan, T. F. Kassner* - - - - - 46

TECHNICAL NOTE

INSTRUMENTS

A Dual-Energy Method for Measuring Void Fractions in Flowing Mediums / *F. E. LeVert, E. Helminski* - - - - 58

DEPARTMENTS

AUTHORS - - - - - 2
LETTERS TO THE EDITOR - - - - - 4
BOOK REVIEW - - - - - 61