



nuclear technology

CONTINUING NUCLEAR APPLICATIONS & TECHNOLOGY

EDITOR

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

ANS OFFICERS

N. JOSEPH PALLADINO, *President*
JOHN W. LANDIS, *President Elect*
JAMES R. LILIENTHAL, *Treasurer*
OCTAVE J. DU TEMPLE, *Executive Secretary*

ANS STAFF

NORMAN H. JACOBSON *Publications Manager*
RUTH FARMAKES *Assistant Staff Editor*
DIANNE DORAN *Copy Editor*
SIEGFRIED H. KRAPP *Production Manager*
KATHRYN FROELICH *Production Assistant*
SHIRLEY G. KRUG *Production Artist*

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 GROTENHUIS, VINCENT P. GUINN, DAVID B. HALL, DANIEL F. HANG, JOSEPH M. HENDRIE, PAUL KRUGER, STEPHEN LAWROSKI, FORREST J. REMICK, WALTON RODGER, ZOLTAN ROSZTOCZY, SOL SANDHAUS, 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 \$25/volume, three volumes per year. Single copy price is \$6 (special issue slightly higher). It is printed in Danville, Illinois, and secondclass postage is paid at Hinsdale, Illinois, and at additional mailing offices. Copyright © 1971 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 is a compilation of several over the past year. With this we are completing the changes of our name to *Nuclear Technology* and are choosing this means to mark the occasion.

Editor's Note:

The January 1971, issue continues publication of "Nuclear Applications and Technology" under the new title of "Nuclear Technology." The volume of material now appearing in this ANS journal requires a change from two to three volumes a year, beginning with volume 10 in 1971.

CONTENTS — JANUARY 1971

TECHNICAL PAPERS AND NOTES

REACTORS

The SEFOR Minimum Critical Core / L. D. Noble, P. Greebler, G. R. Pflasterer, Jr., B. U. B. Sarma, D. Wintzer - - - - - 5

Fission Products in Reactor Dynamics / Jan S. Woyski - - 11

The Effect of a Metallurgical Phase Change in Fuel on the Power Coefficient of EBR-II / John K. Long - - - - - 17

A Proposal for Using Nuclear Reactors as Thermal Radiation Sources / K. Almenas - - - - - 22

On-Line Noble Gas Fission Product Monitoring in Experimental Breeder Reactor II / G. S. Brunson - - - - - 33

FUELS

Prediction of the Irradiation Performance of Coated Particle Fuels by Means of Stress-Analysis Models / J. L. Kaae, D. W. Stevens, C. S. Luby - - - - - 44

Thermal Expansion of Uranium and Tantalum Monocarbides up to 2700°C / Hans K. Richards - - - - - 54

Development of an Ultrafine Grain Size Type-316 Stainless-Steel Cladding / G. A. Reimann - - - - - 62

MATERIALS

Analysis of Corrosion of Stainless Steel in a Sodium and High Radiation Environment / J. N. Anno, J. A. Walowit - 67

RADIATION

Ionizing Radiation Effects in Lithium Niobate / William Primak, T. T. Anderson, S. L. Halverson - - - - - 76

TECHNIQUES

A Dual Spectrum Concept for LMFBR Fuel Assay / Charles Kelber - - - - - 85

DEPARTMENTS

AUTHORS - - - - - 2

BOOK REVIEWS - - - - - 91