

**Proceedings of the Second ASTM-EURATOM Symposium
on Reactor Dosimetry**

**DOSIMETRY METHODS FOR FUELS,
CLADDING, AND STRUCTURAL MATERIALS**

Held at
Palo Alto, California
October 3 - 7, 1977

Sponsors

ASTM, Subcommittee E 10.05 on Dosimetry (E 10.05)
EURATOM, Working Group on Reactor Dosimetry (WGRD)
Electric Power Research Institute (EPRI)
U. S. Nuclear Regulatory Commission (NRC)
with the cooperation of the
International Atomic Energy Agency (IAEA)

*UNMUL
Gift
10-3400*

PROGRAM SUMMARY

The papers are grouped in nine sessions:

Volume I

- Reviews and Overviews
- Dosimetry for Structural Materials Irradiation
- Fuel Element Dosimetry: Pre- and During Irradiation
- Post-Irradiation Analysis of Nuclear Fuels

Volume II

- General
- Determination of Neutron Spectra
- Techniques
- Nuclear Data and Standards for Dosimetry
- Workshop Reviews and Conclusions

Volume III

and six workshops on:

- Dosimetry Materials: Procurement, Fabrication, and Assay
- High-Energy Neutron Dosimetry
- Dosimetry for Light Water Reactor Pressure Vessel Surveillance Programs
- Utilization of Benchmark Neutron Fields
- Standardization of Fission Product Yields
- Computer Codes for Unfolding Neutron Spectra

CONTENTS OF VOLUME II

	Page
SESSION V: GENERAL	
<i>Dosimetrie de Reacteurs Prehistoriques</i> R. Naudet	499
<i>Environmental Dosimetry</i> Raymond Gold	507
<i>Radiation-Induced Defect Production and Annealing in Strained and Impure bcc Metals</i> J. R. Beeler, Jr. and M. F. Beeler	549
<i>Short Time Decay of Irradiated Fuel</i> Kurt Baumung	563
<i>Photofission Effects in Reactor Pressure Vessel Dosimetry</i> C. D. Bowman, C. M. Eisenhauer, and D. M. Gilliam	575
<i>A Report on the Second Advisory Group Meeting on Fission Product Nuclear Data</i> W. J. Maeck and G. Lammer	583
SESSION VI: DETERMINATION OF NEUTRON SPECTRA	
<i>Neutron Spectrometry for Reactor Dosimetry</i> G. De Leeuw-Giertz and S. De Leeuw	591
<i>Analytical Efforts to Support the EPRI LWR Dosimetry Program</i> G. L. Simmons	627
<i>Calculations and Measurements of Fast Neutron Spectrum in a Research Reactor</i> R. Lloret, R. Perdreau, and Tran-Dai-Phuc	637
<i>Experimental Evaluations of Neutron Spectra for a Critical Facility by Multi-foil Activations</i> Ikuo Kondo	653
<i>Reactor Pulse CALIBAN Determination des Spectres Appropriés de Neutrons: Méthode Iterative Appliquée aux DéTECTEURS à Activation et de Fission</i> J. Morin and J. Dorlet	667
<i>Neutron Dosimetry and Spectral Measurements at the White Sands Missile Range Fast Burst Reactor</i> H. L. Wright, J. L. Meason, and J. T. Harvey	683

	Page
<i>Spectrum and Dose Calibrations of Controlled Neutron Fields at the APRF Critical Assembly</i> A. H. Kazi, G. S. Davis, and C. R. Heimbach	699
<i>Neutronics and Radiation Damage Calculations for Fusion Reactors</i> R. G. Alsmiller, Jr., T. A. Gabriel, and R. T. Santoro	713
 SESSION VII: TECHNIQUES	
<i>Helium Production Measurements for Neutron Dosimetry and Damage Correlations</i> Harry Farrar IV and Ezra P. Lippincott	725
<i>SSTR and Emulsion Techniques and Their Applications for FBR, LWR, and MFER Programs</i> James H. Roberts and Raymond Gold	739
<i>Performance of Self-powered Neutron Detectors in Pressurized Water Reactors</i> H. D. Warren and D. P. Bozarth	775
<i>Thermoelectric Neutron Dosimetry: A Short Introduction</i> F. Mathieu, R. Meier, J. Debrue, F. Leonard, and W. Schubert	789
<i>Fast Neutron Spectrometry with a Drastic Background Discrimination</i> T. Pinelli, F. Fossati, G. Berther, G. Bracco, and P. Torre	813
<i>Fast Neutron Dosimetry by the Reaction ^{93}Nb (n, n'): Counting Technique for ^{93}Nb Activity</i> F. Hegedus	825
<i>Some Studies of the Nb93 (n, n') Nb93m Reaction</i> W. H. Taylor	831
 SESSION VIII: NUCLEAR DATA AND STANDARDS FOR DOSIMETRY	
<i>Status of ENDF/B Special Applications Files</i> SAFE Subcommittee of the Cross Section Evaluation Working Group, Presented by Leona Stewart	843
<i>Review of Differential Neutron Data for Important Reactions Not Yet Included in ENDF/B-V Dosimetry File</i> M. F. Vlasov, K. Okamoto, L. Edvardson, and O. Schwerer	855
<i>Nuclear Data Guide for Reactor Neutron Metrology</i> Willem L. Zijp	873

	Page
<i>Trends in Theoretical Calculation of Dosimetry and Gas Production Cross Sections for FBR's, LWR's, and MFE's</i>	945
F. M. Mann and R. E. Schenter	
<i>Measurement of Threshold Reaction Cross Section Ratios in Fission Neutron Fields</i>	953
R. Fleming and V. Spiegel	
<i>Reaction Rate Measurements and Integral Cross Sections Using the NBS ^{252}Cf Fission Neutron Indoor Irradiation Facility</i>	959
V. Spiegel, C. M. Eisenhauer, J. A. Grundl, and G. C. Martin, Jr.	
<i>Intercomparison of ^{152}Eu Gamma-Ray Emission-Rate Measurements</i>	969
K. Debertin	
 SESSION IX: WORKSHOP REVIEWS AND CONCLUSIONS	
<i>Dosimetry Materials: Procurement, Fabrication and Assay</i>	975
H. L. Adair and J. Van Audenhove	
<i>High-Energy Neutron Dosimetry</i>	977
R. R. Heinrich and N. Kirch	
<i>Dosimetry for Light Water Reactor Pressure Vessel Surveillance Programs</i>	979
C. Z. Serpan, Jr. and A. Fabry	
<i>Utilization of Benchmark Neutron Fields</i>	981
J. Grundl and G. De Leeuw-Giertz	
<i>Standardization of Fission Project Yields</i>	983
W. J. Maeck and H. Ramthun	
<i>Computer Codes for Unfolding Neutron Spectra</i>	985
C. A. Oster and R. Dierckx	