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Selected Technical Papers



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REACTOR DOSIMETRY

14th International Symposium

JAI Guest Editors:
David W. Vehar
Douglas L. Selby
Mary Helen Sparks

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**Journal of ASTM International
Selected Technical Papers STP1550
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Symposium**

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David W. Vehar
Douglas L. Selby
Mary Helen Sparks



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Foreword

THIS COMPILATION OF THE *JOURNAL OF ASTM INTERNATIONAL (JAI)*, Special Technical Publication, STP1550, The Fourteenth International Symposium on Reactor Dosimetry was held in Bretton Woods, New Hampshire, USA, May 22-27, 2011. This symposium was jointly sponsored by ASTM International Committee E10 on Nuclear Technology and Applications and the European Working Group on Reactor Dosimetry (EWGRD). Co-sponsors were Westinghouse Electric Company, Sandia National Laboratories, Thermo Fisher Scientific, Bruker Biospin, National Institute of Standards and Technology, and the U.S. Department of Energy.

Dr. David W. Vehar, Sandia National Laboratories, Albuquerque, New Mexico, USA served as the Symposium Chairman. The JAI Guest Editors are David Vehar, Douglas L. Selby, Oak Ridge National Laboratory, Oak Ridge, TN, USA, and Mary Helen Sparks, White Sands Missile Range, White Sands, NM, USA.

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In Memoriam

608 **Dr. Bohumil Ošmera, 1942–2009**

617 Our colleague and friend Dr. Bohumil Ošmera passed away on August 12th, 2009
628 at his home due to heart disease.

628 Bohumil Ošmera was a specialist in reactor physics, neutron spectrometry and
639 metrology, and reactor dosimetry. He worked as the Head of Reactor Physics Di-
650 vision, Head of Experimental Reactor Physics Department, and chief scientist
661 at the Nuclear Research Institute Řež in the Czech Republic. He was a member
672 of ASTM, the Czech representative to the EWGRD for many years and founder
683 of the Working Group on Reactor Dosimetry on VVERs. Sharing of knowledge
694 and experience on reactor dosimetry between East and West Europe was one
705 of Bohumil's priorities long before the disappearance of the Iron Curtain, when
716 differences in language and restraints on travel made such exchanges difficult.
727 He created a bridge between the Russian scientific expertise on Reactor Physics,
738 and VVER in particular, and the Western countries, which eventually led to the
749 WGRD VVER becoming part of the EWGRD.

750 Bohumil played an important role in several large international projects
761 under IAEA and EC contracts uniting the international teams of Eastern Europe
772 scientists. Bohumil's talented work at high level and kindness towards his col-
783 leagues are still remembered.

794 Bohumil was responsible for the organization of the 9th International Symposi-
805 um on Reactor Dosimetry in Prague in 1996. Bohumil played successfully his
816 central role despite the difficulties of this being the first time that this Symposium
827 was organized in an East-European country.

838 We remember Bohumil as friend, colleague and fellow scientist and bridge
849 builder among the reactor dosimetry community in West and East Europe. It is
860 with great sadness that we lose this witty, cheery and amicable man, a long-term
871 friend and colleague for many of us.

Overview

The papers in this volume were presented at the Fourteenth International Symposium on Reactor Dosimetry (ISR-14) and subsequently published in the Journal of ASTM International (JAI) following a peer review process. This Symposium is held approximately every three years and is jointly sponsored by ASTM International and the European Working Group on Reactor Dosimetry. Since the first joint Symposium on Reactor Dosimetry was held at the Petten Research Centre in The Netherlands, the intent has been to provide a forum for high quality presentations in the field of Reactor Dosimetry for the sharing of ideas and results. ISR-14 included oral and poster papers from 18 countries, along with seven workshops on timely subjects.

The keynote session included two papers: one on the energy future by Andrew Cook (AREVA-USA) and one on structural materials for innovative nuclear systems by Pascal Yvon (CEA-France).

There were seven plenary oral sessions of four to six papers each, and two poster sessions with a total of 39 poster papers presented. The oral and poster sessions included the topics Reactor Surveillance and Plant Life; Nuclear Data and Uncertainties; Retrospective Dosimetry; Benchmarks and Intercomparisons; Dosimetry for Core Characterization and Reactor Physics; Dosimetry for Reactor and Accelerator Neutron Sources; Research/Test Reactor and Accelerator Dosimetry; Neutron and Gamma-Ray Transport Calculations and Modeling; Experimental Techniques, New Developments, and Optical Methods; Fusion and High Energy Neutrons; Irradiation Processing and Testing of Electronics; and Damage Correlation and Exposure Parameters.

At the more recent Symposia a Best Paper Award has been given for each of the Poster Sessions. At ISR-14 the award for Poster Session 1 was presented to Stephane Bourganel (CEA-France) for his paper *Sensitivity Studies Associated with Dosimetry Experiments Interpretation*. The award for Poster Session 2 was presented to Bojan Petrovic (Georgia Institute of Technology-USA) for his paper *Dosimetry and Radiation Damage Parameters for Analysis of VHTR Reactors*.

The workshop sessions emphasized a discussion format rather than formal presentations. Workshop topics were: Surveillance Dosimetry; Cross Sections and Nuclear Data; Test and Research Reactors; Benchmarks and Intercomparisons; Transport Calculations; Adjustment Methods and Uncertainties; and Retrospective Dosimetry. The seven workshops were well attended and a summary of the workshops is presented later in this volume.

Finally, the Symposium attendees would like to recognize our Japanese colleagues who were unable to attend due to the devastating earthquake and tsunami that occurred in Japan just two months prior to the Symposium. We look forward to seeing them again at the Fifteenth International Symposium on Reactor Dosimetry scheduled to be held in France in 2014.

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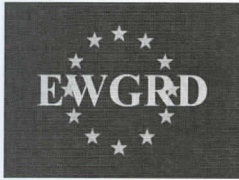
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The European Working Group on Reactor Dosimetry



The European Working Group on Reactor Dosimetry (EWGRD) started around 1960, under the sponsorship of EURATOM, with members designated by the governments from each European Union (EU) laboratories working in the field of reactor physics and technology. The goal was to exchange directly experience and know-how in reactor dosimetry and connected programs. The fields covered were the measurements of thermal and epithermal fluences and fluence rate, the measurement of fast neutron spectra and fluences of thermal and fast reactors, and later the measurement of fusion and spallation neutron spectra.

The EWGRD also initiates collaborative research and training efforts in order to safeguard knowledge preservation and surveys the readiness of the European institutes to meet the current and future reactor dosimetry requirements.

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