

## **NATHAN E. BIXLER**

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### **EDUCATION:**

1982 Ph.D., Chemical Engr, U OF MINNESOTA - MINNEAPOLIS, MN

1976 Bachelors, Chemical Engr, UNIVERSITY OF TOLEDO, OH

1972 HS, College Prep, SWANTON HIGH SCHOOL, OH

### **WORK EXPERIENCE:**

#### **1982-Present: Sandia National Laboratories**

1997-present: Principal Member of the Technical Staff working in nuclear accident progression and consequence analysis for NRC (VICTORIA, RADTRAD, MACCS2, WinMACCS, MEL-MACCS, and SECPOP2000 codes); Performing safety analysis for Mars Science Laboratory Mission for DOE and NASA

1989-1995: Senior Member of the Technical Staff working in nuclear accident progression analysis for NRC (VICTORIA code)

1982-1989: Member of the Technical Staff working in fluid mechanics and heat transfer supporting the Yucca Mountain and WIPP projects

### **SPECIAL SKILLS:**

Fluid Mechanics, Free Surface Flows, Heat Transfer, Porous Flows, Computer Code Development, Computer Simulation, In-Vessel Analysis of Fission Product Behavior (Level-2 PRA), Nuclear Accident Consequence Analysis (Level-3 PRA)

### **PUBLICATIONS:**

Bixler, N. E. and Martinez, M. J.

*Radionuclide Transport Code Development in Support of Nuclear Waste Storage Investigations*  
SAND83-0660, 1983

Bixler, N. E., Mondy, L. A., and Wilson, R. K.

*Comparison of Waste Emplacement Configurations for a Nuclear Waste Repository in Tuff, IV. Thermo-Hydrological Analysis*  
SAND83-0757, 1983

Bixler, N. E. and Eaton, R. R.

*Sensitivity of Calculated Hydrological Flows Through Multilayered Hard Rock to Computational Solution Procedures*

Proc. Symposium on Groundwater Flow and Transport Modeling for Performance Assessment of Deep Geologic Disposal of Radioactive Waste: A Critical Evaluation of the State of the Art, 1985

Bixler, N. E. and Benner, R. E.

*Finite Element Analysis of Axisymmetric Oscillations of Sessile Liquid Drops*

Numerical Methods in Laminar and Turbulent Flow, Part II, 1985

Eaton, R. R., Bixler, N. E., and Reda, D.

*Coupled Hydrothermal Flows of Liquid and Vapor in Welded Tuff: Numerical Modeling of Proposed Experiment*

Coupled Processes Associated with Nuclear Waste Repositories, 1985

Bixler, N. E.

*NORIA--A Finite Element Computer Program for Analyzing Water, Vapor, and Energy Transport in Porous Media*

SAND84-2057, 1985

Eaton, R. R. and Bixler, N. E.

*Analysis of a Multiphase, Porous-Flow Imbibition Experiment in Fractured Volcanic Tuff*

Proc. Symposium on Flow and Transport through Unsaturated Fractured Rock, Geophysical Monograph 42, 1986

Bixler, N. E. and Carrigan, C. R.

*Enhanced Heat Transfer in Partially Saturated Hydrothermal Systems*

Geophysical Research Letters, Vol. 13, 1986

Bixler, N. E. and Scriven, L. E.

*Downstream Development of Three-Dimensional Viscocapillary Film Flow*

Industrial Engineering Chemistry Research, vol. 26, 1987

Bixler, N. E., Eaton, R. R., and Russo, A. J.

*Drying Analysis of a Multiphase, Porous-Flow Experiment in Fractured Volcanic Tuff*

Fundamentals of Heat Transfer in Drying, 1987

Bixler, N. E. and Kraynik, A. M.

*The Onset of Taylor Vortices in Flows with a Circumferential Pressure Gradient: Application to the Helical Screw Rheometer*

Canadian Congress on Applied Mechanics, 1987

Bixler, N. E. and Carrigan, C. R.

*Finite Element Analysis of Heat Transfer in a Hydrothermal Zone*

Numerical Methods in Thermal Problems, vol. 5, 1987

N. E. Bixler

*An Improved Time Integrator for Finite Element Analysis*

Communications in Applied Numerical Methods, 1989

Eaton, R. R., Bixler, N. E., and Gartling, D. K.

*Effect of Pressure Basis Functions on Predicted Water Velocities for Flow in Fractured Rock*

Journal of Contaminant Transport, 1989

Bixler, N. E. and Carrigan, C. R.

*Finite Element Analysis of a Darcy Velocimeter in a Variably Saturated Soil*

Proceedings of the 7th International Symposium on Finite Element Methods in Flow Problems, 1989

T. J. Heames, Williams, D. A., Bixler, N. E., et al.

*VICTORIA: A Mechanistic Model of Radionuclide Behavior in the Reactor Coolant System Under Severe Accident Conditions*

NUREG/CR-5545, SAND90-0756, 1990

Bixler, N. E. and Heames, T. J.

*Status of VICTORIA Development and Assessment*

Proceedings of the 18th Water Reactor Safety Information Meeting, 1990

Bixler, N. E. and Heames, T. J.

*VICTORIA: A Code for Analyzing Severe Nuclear Accidents*

Proceedings of the 6th Miami International Symposium on Heat & Mass Transfer, 1990

Bixler, N. E., Heames, T. J., and Powers, D. A.

*VICTORIA-92 and Its Application to the Phebus-FPT0 Test,*

Proceedings of the Twentieth Water Reactor Safety Information Meeting, 1992

T. J. Heames, Williams, D. A., Bixler, N. E., et al.

*VICTORIA: A Mechanistic Model of Radionuclide Behavior in the Reactor Coolant System Under Severe Accident Conditions*

NUREG/CR-5545, SAND90-0756 Rev. 1, 1992

Bixler, N. E.

*Model for Heat-Up of Structures in VICTORIA*

SAND92-1506, 1993

Bixler, N. E. and Erickson, C. E.

*VICTORIA-92 Pretest Analysis of PHEBUS-FPT0*

SAND93-2275, 1994

Bixler, N. E. and Erickson, C. E.

*Investigation of a Steam Generator Tube Rupture Sequence Using VICTORIA*

Proceedings of the Twenty-Third Water Reactor Safety Information Meeting, 1996

Bixler, N. E. and Schaperow, J. H.

*The Effect of the Number of Condensed Phases Modeled on Aerosol Behavior During an Induced Steam Generator Tube Rupture Sequence*

Proceedings of the Third OECD Specialists Meeting on Nuclear Aerosols in Reactor Safety, 1998

Bixler, N. E., Cole, R. K., Young, M. F., Gauntt, R. O., and Schaperow, J. H.  
*Recent MELCOR and VICTORIA Fission Product Research at the NRC*  
Proceedings of the Twenty-Fifth Water Reactor Safety Information Meeting, 1998

Bixler, N. E.  
*VICTORIA 2.0: A Mechanistic Model for Radionuclide Behavior in a Nuclear Reactor Coolant System Under Severe Accident Conditions*  
NUREG/CR-6131, SAND93-2301, 1998

Bixler, N. E. and Erickson, C. M.  
*RADTRAD: A Simplified Model for Radionuclide Transport and Removal and Dose Estimation*  
NUREG/CR-6604, Supp. 1, SAND98-0272/1, 1999

N. E. Bixler and R. D. Gasser  
*Recent Plant Studies Using VICTORIA 2.0*  
Proceeding of ICONE8, 2000

N. E. Bixler, D. I. Chanin, K. L. McFadden, and D. W. Whitehead  
*Current Activities to Enhance the MACCS2 Code at Sandia National Labs*  
Proceedings of the ANS Annual Meeting, 2001

N. E. Bixler, A. B. Baker, W. E. Beyeler, S. H. Conrad, D. L. Harris, L. A. Malczynski, and P. E. Rexroth  
*Global Energy Futures Model*  
Proceedings of ICONE10, 2002

N. E. Bixler, K. L. McFadden, and J. E. Cash  
*Future Plans for MACCS2*  
Proceedings of the Fourth International MACCS Users Group Meeting, 2002

N. E. Bixler, D. W. Whitehead, J. J. Gregory, C. A. Ottinger, T. D. Brown, and J. A. Mitchell  
*Methodology for a Level 3 PRA Analysis of a Nuclear Reactor Accident Using MACCS2*  
Proceedings of PSAM6, 2002

N. E. Bixler, R. D. Waters, and D. W. Whitehead  
*Uncertainty Analysis with MACCS2 Using Data Based on Expert Elicitation*  
American Meteorological Society Annual Meeting, 2002

N. E. Bixler, S. A. Shannon, C. W. Morrow, B. E. Meloche, and J. N. Ridgely  
*SECPOP2000: Sector Population, Land Fraction, and Economic Estimation Program*  
NUREG/CR-6525 Rev. 1, SAND2003-1684P, 2003

J. A. Mitchell, C. Molenkamp, N. E. Bixler, C. Morrow, and J. V. Ramsdell  
*Comparison of Average Transport and Dispersion Among a Gaussian Model, a Two-Dimensional Model and a Three-Dimensional Model*  
Proceedings of PSAM7, 2004

N. E. Bixler, C. W. Morrow, J. M. Phillips, M. Fatenejad, and J. Mitchell  
*Assessment of Uncertain Input Data, Methodology, and Results for a Level 3 PRA Analysis of a Nuclear Reactor Accident Using MACCS2*  
Proceedings of PSAM7, 2004

N. E. Bixler, J. W. Braithwaite, and D. G. Robinson  
*A Perspective on Risk/Reliability Estimation in the Presence of Aging*  
Incorporating PSA Into Ageing Management, 2004

N. E. Bixler and R. O. Gauntt  
*A Methodology for Performing Consequence Analyses in Support of Level -3 PRAs*  
Proceedings of ANS Probabilistic Safety Analysis Meeting, 2005

S. Ashbaugh, N. E. Bixler, and M. Leonard  
*Accident Progression and Source Term Analysis for Short-Term Station Blackout Scenarios in a BWR with a Mark III Containment*  
SAND2005-6116, 2005

N. E. Bixler, K. L. McFadden, and C. W. Morrow  
*Current Status of the MACCS2 and WinMACCS Codes*  
EFCOG/SAWG Workshop, 2005

N. E. Bixler, V. D. Cleary, and J. Joonyub  
*MACCS2 Consequence Calculations for a Postulated Short-Term Station Blackout at a Pressurized Water Reactor with an Ice Condenser Containment and a Boiling Water Reactor with a Mark III Containment*  
SAND2006-0632, 2005

N. E. Bixler et al.,  
*Sandia Support of the NRC's Nuclear Power Plant Vulnerability to Aircraft Attack Program*  
SAND2006-1284P

T. J. Bartel, G. C. Bessette, N. E. Bixler, B. P. Danowsky, C. A. Glissman, R. J. Lipinski, D. L. Potter, D. A. Powers, and D. G. Robinson  
*Preliminary Safety Analysis Report for the Mars Science Laboratory MMRTG Launch Approval*  
SAND2006-7312

#### **SUPPLEMENTARY ACHIEVEMENTS:**

Received SAFE Award for defending VICTORIA during the VICTORIA Independent Peer Review (V. Mubayi et al., BNL Tech Rep. W-6436, 1997)

Employee Recognition Award for Nuclear Power Plant Vulnerability Analysis Team, 2004

Employee Recognition Award for Research and Test Reactor Vulnerability Assessment Team, 2005

Best Presentation Award for EFCOG/SAWG Workshop, 2005

Employee Recognition Award for Radioisotope System Launch Safety Team, 2007

Lead trainer for NRC's Accident Consequence Analysis P-301 Course, 2003-present

**REFERENCES:**

John E. Kelly, Department 6870, Sandia National Labs, 844-8993

Dana A. Powers, Department 6870, Sandia National Labs, 845-9838

Randall O. Gauntt, Department 6762, Sandia National Labs, 844-2829

Jocelyn A. Mitchell, Office of Research, Nuclear Regulatory Commission, 301-415-5289

Jason H. Schaperow, Office of Research, Nuclear Regulatory Commission, 301-415-5907