

Indian Point Nuclear Generating Units 2 and 3
Docket Nos. 50-247/ 50-286-LR

**NRC Staff's Response in Opposition to State of New York's Motion for Partial Summary
Disposition of NYS Contention 16/16A**

Exhibit N

Nathan E. Bixler
Principal Member of Technical Staff
Sandia National Laboratories

Education:

Ph. D. in Chemical Engineering 1982 University of Minnesota
BS in Chemical Engineering 1976 University of Toledo

Work Experience:

1998 – 2009 Principal investigator for code development and analysis of nuclear accident consequences, including RADTRAD, MACCS2, WinMACCS, SECPOP2000, and MELMACCS, for the NRC. Development focused on improved fidelity of atmospheric transport, dosimetry, and health effects modeling. Analyses were to evaluate the security of nuclear power plants, the security of research and test reactors, and to oversee the consequence analyses for the State of the Art Reactor Consequence Analysis (SOARCA) Project.

2003 – 2009 Principal instructor for the weeklong NRC class titled “P-301 – Accident Consequence Analysis.” Training emphasizes level-3 probabilistic risk assessment (PRA) and the use of the WinMACCS/MACCS2 code system for estimating health and economic consequences.

2006 – 2009 Member of the ANS writing group to develop a standard for level-3 PRAs.

2006 – 2008 Performed consequence for the Protective Action Recommendation (PAR) study using the WinMACCS/MACCS2 code system. The project was to reevaluate and potentially revise NRC guidance on protective actions at nuclear power plants.

2005 – 2009 Lead investigator for consequence analyses of a 2011 NASA mission to Mars (Mars Science Laboratory). Responsible for the content of Vol. III of the Final Safety Analysis Report (FSAR), which is a major element of the launch approval process.

1990 – 1998 Principal investigator for VICTORIA development and analyses. VICTORIA is a fission product release and transport code developed by Sandia National Laboratories for the NRC. Work focused on chemistry and aerosol physics within the reactor coolant system during a severe accident. VICTORIA analyses emphasized validation against fission product release tests (ORNL

HI/VI, SNL ST, VERCORS), aerosol deposition (HEVA, STORM), and integral data (PHEBUS).

1982 – 1990 Code development and analysis in the areas of fluid mechanics, heat transfer, and two-phase flow in porous media. Emphasis on waste repository analyses of Yucca Mountain and WIPP.

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.
RexrothGlobal 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 Metrological 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

T. J. Bartel, ..., N. E. Bixler, et al.
Draft Safety Analysis Report for the Mars Science Laboratory MMRTG Launch Approval
SAND2007-7759, 2008.

N. E. Bixler, J. E. Cash, L. L. Eubanks, R. F. Haaker, and K. L. McFadden
Consequence Analysis with WinMACCS 3.4
Proceedings of the 9th International Probabilistic Safety Assessment and Management
(PSAM9) Conference, 2008.

T. J. Bartel, ..., N. E. Bixler, et al.
Final Safety Analysis Report for the Mars Science Laboratory MMRTG Launch Approval
SAND2008-3522, 2008.

A. L. Brown and N. E. Bixler
Plume Rise Calculations Using a Control Volume Approach and the Damped Spring
Oscillator Analogy.
Proceedings of the ASME Summer Heat Transfer Conference, SAND2008-4326C, 2008.