

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 – Present** 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 analyses 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 – Present** Lead investigator for consequence analyses of a 2011 NASA mission to Mars (Mars Science Laboratory) and other future space missions involving nuclear materials. Responsible for the content of Vol. III of the Final Safety Analysis Report (FSAR), which is a major element of the launch approval process.

**2010 – Present** Lead investigator for developing a framework for calculating source terms for fuel recycling plants. The work supports NRC license reviews for potential reprocessing plants to be built in the US.

**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:**

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

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*Finite Element Analysis of Heat Transfer in a Hydrothermal Zone*  
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- Bixler, N. E. and Carrigan, C. R.  
*Finite Element Analysis of a Darcy Velocimeter in a Variably Saturated Soil*  
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- Bixler, N. E. and Heames, T. J.  
*Status of VICTORIA Development and Assessment*  
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*The Effect of the Number of Condensed Phases Modeled on Aerosol Behavior During an Induced Steam Generator Tube Rupture Sequence*  
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*Methodology for a Level 3 PRA Analysis of a Nuclear Reactor Accident Using MACCS2*

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