Bradley T. Rearden, Ph.D.

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Innovative Research and Development Management

A results-driven, hands-on individual who champions innovation, communication, and quality as demonstrated through years of nuclear engineering research and development, with successful management and team building leadership.

Education

Texas A&M University

Doctor of Philosophy in Nuclear Engineering, 1999
Master of Science in Nuclear Engineering, 1995
Bachelor of Science in Nuclear Engineering, 1993

Professional Experience

Oak Ridge National Laboratory (1999–Present)

Providing innovation, leadership, and building relationships in research and development through a progression of roles with increasing impact.

Leader, Modeling and Simulation Integration (2016-Present)
Coordinating and integrating modeling and simulation activities across the Reactor and Nuclear System Division (RNSD) including signature capabilities in nuclear data; neutronics; radiation transport and shielding; thermal hydraulics; structural mechanics; fuel performance; reactor safety, system dynamics, instrumentation, and controls; nuclear security; and used nuclear fuel; as well cross cutting capabilities such as quality assurance, software development infrastructure, user interfaces, training, multiphysics coupling, verification, validation, and uncertainty quantification. Responsibilities of this role include:

- Lead RNSD Modeling and Simulation Leadership Team, a strategic cross-cutting team consisting of select line managers and senior staff from Consortium for the Advanced Simulations of LWRs (CASL), Nuclear Energy Advanced Modeling and Simulation (NEAMS), SCALE, and other programs who guide technical, programmatic, and managerial aspects of modeling and simulation activities; and
- Perform strategic planning and take actions to realize near-term and long-term objectives and goals.

Leader, Integration Product Line, NEAMS Program (2015-Present)
Provide technical guidance and vision for the NEAMS Program to develop, deploy and apply a state-of-the-art modeling and simulation toolkit on leadership class computing platforms for predictive evaluations of the performance and safety of advanced nuclear reactor and fuel designs. This work is completed under the auspices of the U.S. Department of Energy (DOE), Office of Nuclear Energy. Responsibilities of this role include:

- Direct activities at five DOE national laboratories to integrate the capabilities of the Reactor Product Line and the Fuels Product Line into multiphysics and multiscale applications, integrate quality assurance and uncertainty quantification technologies, and integrate the user with the simulation and solution;
- Facilitate activities for advanced experiment design for the Transient Reactor Test Facility (TREAT) at Idaho National Laboratory;
- Coordinate NEAMS funded projects under the Nuclear Energy University Program (NEUP) and Small Business Innovation Research (SBIR);

- Serve as a member of the NEAMS Leadership Council supporting the National Technical Director and coordinating activities across the program.

Manager, SCALE Code System (2009–Present)
Manage all aspects of internationally recognized nuclear safety analysis software package deployed to over 7000 users in 56 nations. The development, testing, deployment, and application of SCALE is a cross cutting activity that integrates the expertise of staff members across the Reactor and Nuclear System Division (RNSD), with continuing and evolving sponsorship from the U.S. Nuclear Regulatory Commission (NRC), the U.S. DOE, and the National Nuclear Security Administration (NNSA). Responsibilities and successes include:

- Direct SCALE Leadership Team, a strategic cross-cutting team consisting of select line managers and senior staff who guide technical, programmatic, and managerial aspects of SCALE;
- Develop, document, and implement multi-year strategic visions for modernization and growth;
- Manage and coordinate activities of nearly 50 advanced-degreed engineers, computer scientists, and physicists across several organizational groups and eight technical teams;
- Manage multi-million dollar budgets; interface with sponsors, end users, and other stakeholders;
- Champion innovation in the design of revolutionary architectures and dozens of new features with controlled risk management in terms of cost and schedule to successfully propel a legacy product into the future;
- Developed and implemented ISO 9001 quality assurance, configuration management, and deployment strategies with associated infrastructure, resulting in 98% decrease in feature defect rate;
- Successfully overcame barriers between internal development and management teams to cultivate a collaborative sense of purpose through improved communication and improved recognition of individual efforts, resulting in minimization of redundant or contradictory efforts;
- Mentored high-value team members in professional growth, recruited new team members with fresh perspectives, and evaluated effectiveness of other team members for continued participation, enabling new features to be developed in days instead of months;
- Improved communication to stakeholders through personal interactions, domestic and international conference presentations, newsletters, website, and social media, resulting in increased community awareness and interest as demonstrated by tripling of product deployment for wider impact to cutting-edge projects around the world;
- Modularized and streamlined domestic and international training program, which provides 10+ weeks of hands-on instruction annually, increasing public enrollment while decreasing instructor preparation time by 50%;
- Serving as subject matter expert advising government agencies and international corporations on the application of sensitivity and uncertainty methodologies in the licensing of billion-dollar operations; and chairing international expert group within the Organization for Economic and Cooperation's Nuclear Energy Agency in Paris, France.

Senior Research and Development Staff (2006–2009)

- Created, deployed, and promoted the world's first production-quality sensitivity and uncertainty analysis tools for nuclear criticality safety and reactor analysis, creating a new standard for the industry;
- Managed activities of 14 staff members and several graduate students as leader of the *Criticality Safety Methods Team* and as programmatic and technical lead of numerous projects;
- Served as technical lead for research and development of innovative methodologies used to validate nuclear design and licensing simulations through the use of experimental measurements coupled with sensitivity and uncertainty analysis calculations;
- Led development and introduction of new graphical user interfaces to simplify the use of advanced methodologies and provide users with a means of obtaining in-depth understanding of underlying physical processes;

- Initiated multi-year projects to apply advanced sensitivity and uncertainty methods for nuclear facility licensing and nuclear criticality experiment design with industry and government partners;
- Coordinated the development and release of unique sensitivity analysis tools and data to the global community through the Organization for Economic Cooperation and Development Nuclear Energy Agency based in Paris.

Research and Development Staff (1999–2005)

- Developed and deployed new capabilities for sensitivity and uncertainty analysis for nuclear safety assessment and licensing and promoted this methodology to industry and regulators, securing international acceptance of novel techniques;
- Produced numerous innovative software packages for the SCALE code system that continue to provide foundational support for advanced techniques;
- Developed innovative visualization tools to provide analysts with in-depth insight into physical processes;
- Collaborated with numerous industry and government partners in advanced analysis and licensing studies;
- Lead instructor of multi-day training courses taught domestically and internationally for end users, regulators and developers in theory and application sensitivity and uncertainty analysis for nuclear criticality safety and reactor physics analysis and validation.

Postgraduate Research Associate (1998–1999)

- Developed the world's first three-dimensional sensitivity and uncertainty analysis package based on Monte Carlo neutron transport methods as a Ph.D. dissertation project. This package continues to provide the foundation of sensitivity and uncertainty analysis capabilities in SCALE.
- Performed sensitivity analyses for criticality safety applications using state-of-the-art evaluation tools developed for the SCALE code system.

Texas A&M University (1994–1997)
Graduate Research Assistant

- Performed nuclear non-proliferation engineering analyses, as a Ph.D. candidate, in conjunction with DOE's Amarillo National Resource Center for Plutonium. Projects included the design of first-of-its-kind mixed-oxide nuclear fuel irradiation experiment and analysis of mixed-oxide fuel assemblies.
- Performed reactor analysis licensing calculations, as a Master's candidate, and completed documentation to support a 50% power up rate of TRIGA nuclear reactor with a highly-enriched uranium core and analyzed conversion of the core from highly-enriched to low-enriched uranium fuel for a nuclear non-proliferation program.

Savannah River Site - Scientific Computations Division - Radiation Shielding Group (1993)
Graduate Researcher

- Contributed to the development of a user-friendly input processor for a multi-dimensional neutron transport code.

Texas Utilities - Reactor Engineering - Reactor Physics (1991–1992)
Summer Internship (two consecutive summers)

- Various projects included the generation of core following reports and the development of a one-dimensional neutron diffusion model to predict axial power profiles of the Commanche Peak Steam Electric Station.

Honor & Activities

Professional Development

- Management Boot Camp – ORNL, 2014
- Situational Leadership II – Manager Certification – Blanchard Certified, 2013-2014
- Managing Difficult Confrontations – ORNL, 2009
- University of Tennessee – College of Business Administration Center for Executive Education – Engineer/Scientist as a Manager Program, 2007
- Best Practices in Project Management – Project Management Associates, 2006
- Developing Strategic Funding Sources – Lore Institute, 2005

Invited Presentations

- Nuclear Science Week, Knoxville, Tennessee, October 2015
- Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH, Garching, Germany, June 2015
- Nuclear Data Needs and Capabilities for Applications, Berkeley, California, May 2015
- Joint International Conference on Supercomputing in Nuclear Applications plus Monte Carlo 2013 (SNA + MC 2013), Paris, France, October 2013
- American Nuclear Society Winter Meeting, San Diego, California, November 2012
- International Nuclear Codes Workshop/MCNEG, Risley, Cheshire UK, March 2008
- International Symposium NUCEF 2005, Tokai-mura, Ibaraki-ken, Japan, February 2005

Awards

- American Nuclear Society - Landis Young Member Engineering Achievement Award - 2007
- U.S. Department of Energy – Undergraduate Research Programs – Outstanding Mentor Award, 2004 and 2007.
- Oak Ridge Institute for Science and Education – Outstanding Mentor Award, 2007.
- ORNL Nuclear Science and Technology Division – Scientific and Technical Awards for Release of SCALE 5 and Development of Sensitivity and Uncertainty Analysis Methods – 2004
- UT-Battelle Awards Night – Outstanding Accomplishment in Science and Technology – Early Career Award for Engineering Accomplishment – Finalist 2003
- Apple Computer – Worlds of Science K–12 Educational Software Contest – 1st Place Adult Individual Category – 1998
- Institute for Nuclear Power Operations – Graduate Fellowship Recipient - 1993-1994

Reviewer

- *Nuclear Science and Engineering*
- *Nuclear Technology*
- *Nuclear Engineering and Technology*
- *Nuclear Science and Techniques*
- *Annals of Nuclear Energy*
- *Journal of Heat Transfer*
- *Journal of Nuclear Engineering and Radiation Science*
- *Nuclear Instruments and Methods in Physics Research Section A*
- *Science and Technology of Nuclear Installations*
- Numerous conferences and topical meetings

American Nuclear Society

- Member since 1989
- *Nuclear Criticality Safety Division* (national division with over 800 members) – Chair 2010-2011, Vice Chair 2009-2010, Secretary 2007–2009, Program Committee Member 2001-present
- *Oak Ridge/Knoxville Local Section* – Chair 2006–2007; Vice Chair/Chair Elect 2005-2006; Arrangements Committee Chair 2004-2005

- *Young Members Group* (innovative national group) – Treasurer 2006–2008.
- *Texas A&M Student Branch* - Vice President 1991-1992

International Collaboration

- *Organization for Economic Cooperation and Development, Nuclear Energy Agency* – Participant in international expert panels: Working Party for Nuclear Criticality Safety, Working Party on Scientific Issues of Reactor Systems, and Working Party on International Nuclear Data Evaluation Co-operation
- *OECD/NEA/WPNCS Expert Group on Uncertainty Analysis for Criticality Safety Assessment* – Chair 2014–Present

Conference Leadership

- *International Conference on Nuclear Criticality Safety 2015* – Uncertainty and Sensitivity Analysis Track Leader
- *PHYSOR 2012 – Advances in Reactor Physics* – Nuclear Criticality Safety Track Leader
- *Monte Carlo 2005 and 2007 Topical Meetings* – Technical Program Committee Member
- *Nuclear Criticality Safety Division Topical Meeting 2005* – Technical Program Committee Member
- *International Youth Nuclear Congress 2000* – Technical Program Committee Member
- *International Forum - Youth and the Plutonium Challenge* - Obninsk, Russia, Co-chairman, July, 1998
- *American Nuclear Society Central Regional Student Conference* – Co-chairman, 1992

Honor Societies

- *Alpha Nu Sigma* – Member Since 1992
- Texas A&M Student Branch – President 1993–1994, Vice President 1992–1993
- *Tau Beta Pi* – Member Since 1993
- Texas A&M Student Branch - Treasurer 1993–1994

Personal Activities

- School Board member for St. Mary's Catholic School
- Knights of Columbus member
- National Society of the Sons of the American Revolution member
- Wakeboarding, snowboarding, and boating

Publications

Ph.D. Dissertation

1. B. T. Rearden, *Development of SAMS: A Sensitivity Analysis Module for the SCALE Code System*, Texas A&M University (1999).

M. S. Thesis

2. B. T. Rearden, *Engineering Analysis of a Power Upgrade for the Texas A&M Nuclear Science Center Reactor*, Texas A&M University (1995).

Refereed Journal Articles

3. C. M. Perfetti, B. T. Rearden, and W. R. Martin, "SCALE Continuous-Energy Eigenvalue Sensitivity Coefficient Calculations," *Nucl. Sci. Eng.* **182**(3), 332-353 (2016).
4. C. M. Perfetti and B. T. Rearden, "Development of a Generalized Perturbation Theory Method for Uncertainty and Sensitivity Analysis Using Continuous-Energy Monte Carlo Methods," *Nucl. Sci. Eng.* **182**(3), 354-368 (2016).
5. M. L. Williams, D. Wiarda, W. J. Marshall, and B. T. Rearden, "Covariance Applications in Criticality Safety, Light Water Reactor Analysis, and Spent Fuel Characterization," *Nuclear Data Sheets*, **123**, 92-96 (2015).

6. B. T. Rearden, L. M. Petrie, D. E. Peplow, K. B. Bekar, D. Wiarda, C. Celik, C. M. Perfetti, A. M. Ibrahim, S. W. D. Hart, M. E. Dunn, and W. J. Marshall, "Monte Carlo Capabilities of the SCALE Code System," *Annals of Nuclear Energy*, **82**, 130-141 (2015).
7. M. Salvatores, G. Palmiotti, G. Aliberti, P. Archier, C. De Saint Jean, E. Dupont, M. Herman, M. Ishikawa, T. Ivanova, E. Ivanov, S. J. Kim, I. Kodeli, G. Manturov, R. McKnight, S. Pelloni, C. Perfetti, A. J. M. Plompen, B. T. Rearden, D. Rochman, K. Sugino, A. Trkov, *et al.,* "Methods and Issues for the Combined Use of Integral Experiments and Covariance Data: Results of a NEA International Collaborative Study," *Nuclear Data Sheets,* **118**, 38–71 (2014).
8. M. L. Williams, G. Ilas, W.J. Marshall, B.T. Rearden, "Applications of Nuclear Data Covariances to Criticality Safety and Spent Fuel Characterization," *Nuclear Data Sheets,* **118**, 341–345 (2014).
9. M. L. Williams, G. Ilas, M. A. Jessee, B. T. Rearden, D. Wiarda, W. Zwermann, L. Gallner, M. Klein, B. Krzykacz-Hausmann, and A. Pautz, "A Statistical Sampling Method for Uncertainty Analysis with SCALE and XSUSA," *Nucl. Tech.* **183**, 515–526 (2013).
10. J. A. Roberts, B. T. Rearden, and P. H. Wilson, "Determination and Application of Partial Biases in Criticality Safety Validation," *Nucl. Sci. Eng.* **173**, 43–57 (2013).
11. J. Utke, B. T. Rearden, and R. A. Lefebvre, "Sensitivity Analysis for Mixed-Language Numerical Methods," *Procedia Computer Science* **18**, 1794–1803 (2013).
12. B. T. Rearden, M. L. Williams, M. A. Jessee, D. E. Mueller, and D. A. Wiarda, "Sensitivity and Uncertainty Analysis Capabilities and Data in SCALE," *Nucl. Technol*. **174(2)**, 236-288 (2011).
13. S. Goluoglu, L. M. Petrie, Jr., M. E. Dunn, D. F. Hollenbach, and B. T. Rearden, "Monte Carlo Criticality Methods and Analysis Capabilities in SCALE," *Nucl. Technol*. **174(2)**, 214-235 (2011).
14. B. T. Rearden and D. E. Mueller, "Recent Use of Covariance Data for Criticality Safety Assessment," *Nuclear Data Sheets*, **109**, Issue 12, 2739-2744 (2008).
15. M. L. Williams and B.T. Rearden, "SCALE-6 Sensitivity/Uncertainty Methods and Covariance Data," *Nuclear Data Sheets*, **109**, Issue 12, 2796-2800 (2008).
16. B. T. Rearden, W. J. Anderson, and G. A. Harms, "Use of Sensitivity and Uncertainty Analysis in the Design of Reactor Physics and Criticality Benchmark Experiments for Advanced Nuclear Fuel," *Nucl. Technol.*, **151**, 133-158 (2005).
17. B. L. Broadhead, B. T. Rearden, C. M. Hopper, J. J. Wagschal, and C. V. Parks, "Sensitivity- and Uncertainty-Based Criticality Safety Validation Techniques," *Nucl. Sci. Eng.* **146**, 340-366 (2004).
18. B. T. Rearden, "Perturbation Theory Eigenvalue Sensitivity Analysis with Monte Carlo Techniques," *Nucl. Sci. Eng.* **146**, 367-382 (2004).
19. K. R. Elam and B. T. Rearden, "Use of Sensitivity and Uncertainty Analysis to Select Benchmark Experiments for the Validation of Computer Codes and Data," *Nucl. Sci. Eng.* **145**, 196-212 (2003).

Book Chapter

20. G. Radulescu, M. Yavuz, H. Akkurt, N. M. Abdurrahman, B. T. Rearden, G. F. Cuevas-Vivas, J. A. Cowan, T. A. Parish, "Neutronics Benchmarks for the Utilization of Mixed Oxide Fuel in Water Reactors." Nuclear Materials Safety Management. Ed. K. L. Peddicord, L. N. Lazarev. Volume 20 of the series NATO ASI Series, 1997. 271-279. ISBN: 978-94-010-6129-2 (Print) 978-94-011-5070-5 (Online).

Technical Reports

21. B. T. REARDEN and M. A. JESSEE, Eds., *SCALE Code System*, ORNL/TM-2005/39, Version 6.2, Oak Ridge National Laboratory, Oak Ridge, Tennessee (2016).
22. A. Hoefer, T. Ivanova, B. Rearden, D. Mennerdahl, O. Buss, *Proposal for Benchmark Phase IV Role of Integral Experiment Covariance Data For Criticality Safety Validation*, Working Party on

Nuclear Criticality Safety, Expert Group on Uncertainty Analysis for Criticality Safety Assessment, OECD/NEA (2014).

23. T. Ivanova, R. McKnight, D. Mennerdahl, J. C. Neuber, B. Rearden, A. Santamarina, and A. Vasiliev, *Overview of Approaches Used to Determine Calculational Bias in Criticality Safety Assessment*, NEA/NCS/WPNCS/DOC(2013)7, OECD/NEA (2013).
24. W. J. Marshall and B. T. Rearden, *Criticality Safety Validation of Scale 6.1*, ORNL/TM-2011/450, Oak Ridge National Laboratory, Oak Ridge, Tenn., November 2011.
25. *SCALE: A Comprehensive Modeling and Simulation Suite for Nuclear Safety Analysis and Design,* ORNL/TM-2005/39, Version 6.1, Oak Ridge National Laboratory, Oak Ridge, Tennessee (2011).
26. B. T. Rearden and R. A. Lefebvre, *Getting Started with VIBE as a DICE Plug-in Module*, ORNL/TM-2010/60, Oak Ridge National Laboratory, Oak Ridge, Tenn., August 2010.
27. D. E. Mueller, B. T. Rearden, and D. F. Hollenbach, *Application of the SCALE TSUNAMI Tools for the Validation of Criticality Safety Calculations Involving* ^{233}U, ORNL/TM-2008/196, Oak Ridge National Laboratory, Oak Ridge, Tenn., January 2009.
28. B. T. Rearden, D. E. Mueller, S. M. Bowman, R. D. Busch, and S. J. Emerson, *TSUNAMI Primer: A Primer for Sensitivity/Uncertainty Calculations with SCALE*, ORNL/TM-2009/027, Oak Ridge National Laboratory, Oak Ridge, Tenn., January 2009.
29. J. R. Parry, J. D. Bess, B. T. Rearden, and G. A. Harms, *Assessment of Zero Power Critical Experiments and Needs for a Fission Surface Power System*, INL/EXT-08-14678, Idaho National Laboratory, September 2008.
30. L. C. Leal, D. Wiarda, B. T. Rearden, and H. Derrien, ^{233}U *Cross-Section and Covariance Data Update for SCALE 5.1 Libraries*, ORNL/TM-2007/115, UT-Battelle, LLC, Oak Ridge National Laboratory, February 2008.
31. B. T. Rearden and M.L. Williams, *TSUNAMI Sensitivity and Uncertainty Analysis of ZED-2 Experiments*, Letter Report to Julian Lebenhaft, Manager Reactor Physics & Systems, Office of the Chief Engineer, Atomic Energy of Canada, Ltd, September 2006.
32. S. Goluoglu, K. R. Elam, B. T. Rearden, B. L. Broadhead, and C. M. Hopper, *Sensitivity Analysis Applied to the Validation of the 10B Capture Reaction in Nuclear Fuel Casks*, NUREG/CR-6845 (ORNL/TM-2004/48), UT-Battelle, LLC, Oak Ridge National Laboratory, August 2004.
33. B. T. Rearden and K. R. Elam, *Investigations and Recommendations on the Use of Existing Experiments in Criticality Safety Analysis of Nuclear Fuel Cycle Facilities for Weapons-Grade Plutonium*, ORNL/TM-2001/262, UT-Battelle, LLC, Oak Ridge National Laboratory, June 2002.
34. C. V. Parks, B. T. Rearden, M. D. DeHart, B. L. Broadhead, and L. M. Petrie, Jr., *Final EMSP Report U.S. Department of Energy – Development of Nuclear Analysis Capabilities for DOE Waste Management Activities*, April 2001.
35. C. V. Parks, B. T. Rearden, M. D. DeHart, B. L. Broadhead, C. M. Hopper, and L. M. Petrie, *Annual Environmental Management Science Program (EMSP) Project Summary. Project Title: Development of Nuclear Analysis Capabilities for DOE Waste Management Activities*, ORNL/TM-2000/65, February 2000.
36. C. V. Parks, B. T. Rearden, M. D. DeHart, B. L. Broadhead, C. M. Hopper, and L. M. Petrie, *Annual Environmental Management Science Program (EMSP) Summary Progress Report. Project Title Development of Nuclear Analysis Capabilities for DOE Waste Management Activities*, ORNL/TM-1999/101, June 1999.
37. B. L. Broadhead and B. T. Rearden, "Exploratory Studies for Three-Dimensional Sensitivity Methods," ORNL/M-6583, August 1998.

38. B. T. Rearden, S. O'Kelly, and T. A. Parish, *Potential Capability of the Texas A&M University Nuclear Science Center Reactor for Mixed-Oxide Fuel Rodlet Irradiations*, ANRCP-NG-ITWD-96-06, October 1996.

Full-Length Topical Papers

39. B. T. Rearden, *SCALE Newsletter*, **Vol. 48**, Spring 2015, May 2016.
40. C. M. Perfetti and B. T. Rearden, "SCALE 6.2 Continuous-Energy TSUNAMI-3D Capabilities," *ICNC 2015 – International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13-17, 2015.
41. C. M. Perfetti and B. T. Rearden, "Diagnosing Undersampling in Monte Carlo Eigenvalue and Flux Tally Estimates," *ICNC 2015 – International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13-17, 2015.
42. E. L. Jones, G. I. Maldonado, W. J. Marshall, C. M. Perfetti, and B. T. Rearden, "Investigation of the Continuous-Energy Sensitivity Methods in SCALE 6.2 Using TSUNAMI-3D," *ICNC 2015 – International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13-17, 2015.
43. B. T. Rearden, et al, "Criticality Safety Enhancements for SCALE 6.2 and Beyond," *ICNC 2015 – International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13-17, 2015.
44. W. J. Marshall, M. L. Williams, D. Wiarda, B. T. Rearden, M. E. Dunn, D. E. Mueller, J. B. Clarity, and E. L. Jones, "Development and Testing of Neutron Cross Section Covariance Data for SCALE 6.2," *ICNC 2015 – International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13-17, 2015.
45. W. J. Marshall, B. T. Rearden, and E. L. Jones, "Validation of SCALE 6.2 Criticality Calculations Using KENO V.a and KENO-VI," *ICNC 2015 – International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13-17, 2015.
46. W. J. Marshall and B. T. Rearden, "Determination of Critical Experiment Correlations Using the Sampler Sequence within SCALE 6.2," *ICNC 2015 – International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13-17, 2015.
47. V. Sobes, B. T. Rearden, D. E. Mueller, W. J. Marshall, J. M. Scaglione, and M. E. Dunn, "Upper Subcritical Calculations Based on Correlated Data," *ICNC 2015 – International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13-17, 2015.
48. B. T. Rearden, *SCALE Newsletter*, **Vol. 47**, Spring 2015, May 2015.
49. B. T. Rearden, K. B. Bekar, C. Celik, C. M. Perfetti, and S. W. D. Hart, "Advancements in Monte Carlo Capabilities for SCALE 6.2," *ANS MC2015 - Joint International Conference on Mathematics and Computation (M&C), Supercomputing in Nuclear Applications (SNA) and the Monte Carlo (MC) Method,* Nashville, TN, April 19-23, 2015.
50. B. T. Rearden, R. A. Lefebvre, J. P. Lefebvre, K. T. Clarno, M. L. Williams, L. M. Petrie, Jr., U. Mertyurek, B. R. Langley, and A. B. Thompson, "Modernization Strategies for SCALE 6.2," *ANS MC2015 - Joint International Conference on Mathematics and Computation (M&C), Supercomputing in Nuclear Applications (SNA) and the Monte Carlo (MC) Method,* Nashville, TN, April 19-23, 2015.
51. C. M. Perfetti and B. T. Rearden, "Metrics for Diagnosing Undersampling in Monte Carlo Tally Estimates," *ANS MC2015 - Joint International Conference on Mathematics and Computation (M&C), Supercomputing in Nuclear Applications (SNA) and the Monte Carlo (MC) Method,* Nashville, TN, April 19-23, 2015.
52. F. Bostelmann, F. P. Weiß, A. Aures, K. Velkov, W. Zwermann, B. T. Rearden, M. A. Jessee, M. L. Williams, D. Wiarda, W. A. Wieselquist, "Uncertainty and Sensitivity Analysis in Criticality Calculations with Perturbation Theory and Sampling," *ANS MC2015 - Joint International*

Conference on Mathematics and Computation (M&C), Supercomputing in Nuclear Applications (SNA) and the Monte Carlo (MC) Method, Nashville, TN, April 19-23, 2015.

53. B. T. Rearden, et al, "Enhancements in Continuous-Energy Monte Carlo Capabilities for SCALE 6.2," *Proc. of PHYSOR 2014 – The Role of Reactor Physics Towards a Sustainable Future*, Kyoto, Japan, September 28 – October 3, 2014.
54. B. T. Rearden, R. A. Lefebvre, J. P. Lefebvre, K. T. Clarno, M. A. Williams, L. M. Petrie, and U. Mertyurek, "Modernization Enhancements in SCALE 6.2," *Proc. of PHYSOR 2014 – The Role of Reactor Physics Towards a Sustainable Future*, Kyoto, Japan, September 28 – October 3, 2014.
55. C. M. Perfetti and B. T. Rearden, "Continuous-Energy Monte Carlo Methods for Calculating Generalized Response Sensitivities using TSUNAMI-3D," *Proc. of PHYSOR 2014 – The Role of Reactor Physics Towards a Sustainable Future*, Kyoto, Japan, September 28 – October 3, 2014.
56. C. M. Perfetti and B. T. Rearden, "Quantifying the Effect of Undersampling in Monte Carlo Simulations using SCALE," *Proc. of PHYSOR 2014 – The Role of Reactor Physics Towards a Sustainable Future*, Kyoto, Japan, September 28 – October 3, 2014.
57. B. T. Rearden, *SCALE Newsletter*, **Vol. 46**, Spring 2014, May 2014.
58. C. M. Perfetti and B. T. Rearden, "Development of a SCALE Tool for Continuous-Energy Eigenvalue Sensitivity Coefficient Calculations," *Proc. of Supercomputing for Nuclear Applications – Monte Carlo (SNA-MC)*, Paris, France, October 27-31, 2013.
59. K. B. Bekar, C. Celik, D. Wiarda, D. E. Peplow, B. T. Rearden, and M. E. Dunn, "Enhancements in Continuous-Energy Monte Carlo Capabilities in SCALE," *Proc. of ANS NCSD 2013 - Criticality Safety in the Modern Era: Raising the Bar,* Wilmington, NC, September 29–October 3, 2013.
60. W. J. Marshall, D. Wiarda, C. Celik, and B. T. Rearden, "Validation of Criticality Safety Calculations with SCALE 6.2," *Proc. of ANS NCSD 2013 - Criticality Safety in the Modern Era: Raising the Bar,* Wilmington, NC, September 29–October 3, 2013.
61. W.J. Marshall and B.T. Rearden, "The SCALE Verified, Archived Library of Inputs and Data – VALID," *Proc. of ANS NCSD 2013 - Criticality Safety in the Modern Era: Raising the Bar,* Wilmington, NC, September 29–October 3, 2013.
62. B. T. Rearden, K. J. Dugan, and F. Havlůj, "Quantification of Uncertainties and Correlations in Criticality Experiments in SCALE," *Proc. of ANS NCSD 2013 - Criticality Safety in the Modern Era: Raising the Bar,* Wilmington, NC, September 29–October 3, 2013.
63. C. M. Perfetti and B. T. Rearden, "Use of Continuous-Energy Monte Carlo Tools for Eigenvalue Sensitivity Coefficient Calculations," *Proc. of ANS NCSD 2013 - Criticality Safety in the Modern Era: Raising the Bar,* Wilmington, NC, September 29–October 3, 2013.
64. B. T. Rearden, et al, "Overview of SCALE 6.2," *Proc. of ANS NCSD 2013 - Criticality Safety in the Modern Era: Raising the Bar,* Wilmington, NC, September 29–October 3, 2013.
65. B. T. Rearden, SCALE Newsletter, **Vol. 45**, Spring 2013, May 2013.
66. M. L. Williams, G. Ilas, W. J. Marshall, B. T. Rearden, "Applications of Nuclear Data Covariances to Criticality Safety and Spent Fuel Characterization," *Proc.* International Conference on *Nuclear Data for Science and Technology*, New York, NY, March 4-8, 2013.
67. B. T. Rearden, SCALE Newsletter, **Vol. 44**, Spring 2012, May 2012.
68. B. T. Rearden, L. M. Petrie, D. E. Peplow, M. A. Jessee, D. Wiarda, M. L. Williams, R. A. Lefebvre, J. P. Lefebvre, I. C. Gauld, and S. Goluoglu, "Enhancements in SCALE 6.1," *Proc. PHYSOR 2012*, Knoxville, TN, April 15-20, 2012.

69. C. M. Perfetti, W. R. Martin, B. T. Rearden, and M. L. Williams, "Determining Importance Weighting Functions for Contributon Theory Eigenvalue Sensitivity Coefficient Methodologies," *Proc. PHYSOR 2012*, Knoxville, TN, April 15-20, 2012.

70. C. M. Perfetti, W. R. Martin, B. T. Rearden, and M. L. Williams, "Development of Continuous-Energy Eigenvalue Sensitivity Coefficient Calculation Methods in the Shift Monte Carlo Code," *Proc. PHYSOR 2012*, Knoxville, TN, April 15-20, 2012.

71. M. L. Williams, D. Wiarda, H. J. Smith, M. A. Jessee, B. T. Rearden, M. Klein, W. Zwermann, and A. Pautz, "Development of a Statistical Sampling Method for Uncertainty Analysis with SCALE," *Proc. PHYSOR 2012*, Knoxville, TN, April 15-20, 2012.

72. T. Ivanova, C. Laville, J. Dyrda, D. Mennerdahl, Y. Golovko, K. Raskach, A. Tsiboulia, G-S. Lee, S-W. Woo, A Bidaud, P. Sabouri, A. Patel, K. Bledsoe, B. Rearden, J. Gulliford, and F. Michel-Sendis, "Benchmark on Sensitivity Calculation (Phase III)," *Proc. PHYSOR 2012*, Knoxville, TN, April 15-20, 2012.

73. B. T. Rearden, *SCALE Newsletter*, **Vol. 43**, Summer 2011, July 2011.

74. B. T. Rearden, *SCALE Newsletter*, **Vol. 42**, Summer/Fall 2010, December 2010.

75. B. T. Rearden, L. M. Petrie, and M. L. Williams, "Advances in Sensitivity Analysis Capabilities with SCALE 6.0 and 6.1," *Proc. SNA+MC2010*, Tokyo, Japan, October 17-21, 2010.

76. B. T. Rearden, C. M. Perfetti, M. L. Williams, and L. M. Petrie, "SCALE Sensitivity Calculations Using Contributon Theory," *Proc. SNA+MC2010*, Tokyo, Japan, October 17-21, 2010.

77. B. T. Rearden, *SCALE Newsletter*, **Vol. 41**, Winter/Spring 2010, February 2010.

78. D. E. Mueller, B. T. Rearden, and D. A. Reed, "Evaluation of Fission Product Critical Experiments and Associated Biases for Burnup Credit Validation," *Proc. International Workshop on Advances in Applications of Burnup Credit for Spent Fuel Storage, Transport, Reprocessing, and Disposition*, Cordoba, Spain, October 2009.

79. B. T. Rearden, I. Duhamel, and E. Létang, "New SCALE Sensitivity/Uncertainty Capabilities Applied to Bias Estimation and to Design of MIRTE Reference Experiments," in *Proc. 2009 NCSD Topical Meeting*, Richland, WA, August 14-16, 2009.

80. B. T. Rearden, R. A. Lefebvre, A. B. Thompson, Y. Rugama, N. Soppera, M. Bossant, "The VIBE Tool of SCALE – Validation, Interpretation and Bias Estimation," in *Proc. 2009 NCSD Topical Meeting*, Richland, WA, August 14-16, 2009.

81. J. R. Parry, J. D. Bess, B. T. Rearden, and G. A. Harms, "Assessment of Zero Power Critical Experiments and Needs for a Fission Surface Power System", *Proc. Nuclear and Emerging Technologies for Space (NETS-2009)*, Altanta, Georgia, June 15–17, 2009.

82. M. L. Williams, B. L. Broadhead, M. E. Dunn, and B. T. Rearden, "Approximate Techniques for Representing Nuclear Data Uncertainties," *Proc. Eighth International Topical Meeting on Nuclear Applications and Utilization of Accelerators (AccApp'07)*, p. 744-751, Pocatello, Idaho, July 30-August 2, 2007.

83. B. T. Rearden, "Criticality Code Validation Exercises with TSUNAMI," *Proc. 8th International Conference on Nuclear Criticality Safety*, p. 84-88, St. Petersburg, Russia, May 28-June 1, 2007.

84. B. T. Rearden and M. L. Williams, "Eigenvalue Contributon Estimator for Sensitivity Calculations with TSUNAMI-3D," *Proc. 8th International Conference on Nuclear Criticality Safety*, p. 408-412, St. Petersburg, Russia, May 28-June 1, 2007.

85. S. M. Bowman, B. T. Rearden, and J. E. Horwedel, "GeeWiz Integrated Visualization Interface for SCALE 5.1," *Proc. 8th International Conference on Nuclear Criticality Safety*, p. 12-16, St. Petersburg, Russia, May 28-June 1, 2007.

86. S. M. Bowman, M. D. DeHart, M. E. Dunn, S. Goluoglu, J. E. Horwedel, L. M. Petrie, Jr., B. T. Rearden, and M. L. Williams, "New Criticality Safety Analysis Capabilities in SCALE 5.1," *Proc. 8th International Conference on Nuclear Criticality Safety*, p. 403-407, St. Petersburg, Russia, May 28-June 1, 2007.

87. B. T. Rearden and J. E. Horwedel, "Automatic Differentiation with Code Coupling and Applications to SCALE Modules," to be published in *Proc. M&C+SNA 2007*, Monterey, CA, April 15-19, 2007.

88. D. E. Mueller and B. T. Rearden, "Sensitivity Coefficient Generation for a Burnup Credit Cask Model using TSUNAMI-3D," in *Proc. 2005 NCSD Topical Meeting*, Knoxville, TN, September 19-22, 2005.

89. S. M. Bowman, B. T. Rearden, and J. E. Horwedel, "Complete User Visualization Interface for KENO," in *Proc. 2005 NCSD Topical Meeting*, Knoxville, TN, September 19-22, 2005.

90. B. T. Rearden, "Improvements in KENO V.a to Support TSUNAMI-3D Sensitivity Calculations," in *The Monte Carlo Method: Versatility Unbounded in a Dynamic Computing World*, Chattanooga, Tennessee, April 17-21, 2005.

91. S. M. Bowman, B. T. Rearden, and J. E. Horwedel, "Integrated Interactive Visualization for KENO," in *The Monte Carlo Method: Versatility Unbounded in a Dynamic Computing World*, Chattanooga, Tennessee, April 17-21, 2005.

92. B. T. Rearden, C. M. Hopper, and K. R. Elam, "TSUNAMI Analysis of the Applicability of Proposed Experiments to Reactor-Grade and Weapons-Grade Mixed Oxide Systems," pp. 125–132 in *Proc. International Symposium NUCEF2005,* Tokai, Japan, February 9-10, 2005.

93. B. T. Rearden, C. M. Hopper, K. R. Elam, S. Goluoglu, and C. V. Parks, "Applications of the TSUNAMI Sensitivity and Uncertainty Analysis Methodology," pp. 61-66 in *Proc. 7th International Conference on Nuclear Criticality Safety (ICNC2003)"*, Tokai-mura, Japan, October 20-24, 2003.

94. S. M. Bowman, D. F. Hollenbach, M. D. DeHart, B. T. Rearden, I. C. Gauld, and S. Goluoglu, "SCALE 5: Powerful New Criticality Safety Analysis Tools," pp. 447-453 in *Proc. 7th International Conference on Nuclear Criticality Safety (ICNC2003)"*, Tokai-mura, Japan, October 20-24, 2003.

95. W. J. Anderson, M. Saglam, B. T. Rearden, and R. Smith, "Reactor Physics and Criticality Benchmark Evaluations for Advanced Nuclear Fuel: Experiment Analysis Comparison Report," 09-03.pdf in *Proc. American Nuclear Society, Advances in Nuclear Society, Advances in Nuclear Fuel Management III*, Hilton Head, SC, October 5-8, 2003.

96. M. E. Dunn and B. T. Rearden, "Application of Sensitivity and Uncertainty Analysis Methods to a Validation Study for Weapons-Grade Mixed-Oxide Fuel," 35666.pdf in *Proc. 2001 ANS Embedded Topical Meeting on Practical Implementation of Nuclear Criticality Safety*, Reno, NV, November 11-15, 2001.

97. B. T. Rearden, "Sensitivity and Uncertainty Analysis for Nuclear Criticality Safety Using KENO in the SCALE Code System," in *Proc. Monte Carlo Radiation Physics, Particle Transport Simulation Applications*, Lisbon, Portugal, October 23-26, 2000.

98. B. T. Rearden, "SAMS: A Sensitivity Analysis Module for Criticality Safety Analysis Using Monte Carlo Techniques," 122.pdf in *Proc. PHYSOR 2000, ANS International Topical Meeting on Advances in Reactor Physics and Mathematics and Computation into the Next Millennium*, Pittsburgh, PA, May 7-12, 2000.

99. B. L. Broadhead, R. L. Childs, and B. T. Rearden, "Computational Methods for Sensitivity and Uncertainty Analysis in Criticality Safety," pp. 57–65 in *Proc. ICNC'99, Sixth International Conference on Nuclear Criticality Safety*, Vol. I, Palais des Congrès, Versailles, FRANCE, September 20–24, 1999.

100. B. T. Rearden, S. O'Kelly, and T. A. Parish, "Potential Capability of the Texas A&M Nuclear Science Center Reactor for Mixed-Oxide Fuel Rodlet Irradiations," *Proc. American Nuclear Society Topical Meeting - Advances in Nuclear Fuel Management II*, Myrtle Beach, SC, March 23-26, 1997.

Conference Summaries

101. V. Sobes, B. T. Rearden, D. E. Mueller, W. J. Marshall, J. M. Scaglione, and M. E. Dunn, "Upper Subcritical Limit Calculations with Correlated Integral Experiments," *Trans. Am. Nucl. Soc*. **112**, 467-470 **(**2015).

102. C. M. Perfetti and B. T. Rearden, "Performance Enhancements to the SCALE TSUNAMI-3D Generalized Response Sensitivity Capability," *Trans. Am. Nucl. Soc*. **111**, 739-742 **(**2014).

103. C. M. Perfetti and B. T. Rearden, "A New Method for Calculating Generalized Response Sensitivities in Continuous-Energy Monte Carlo Applications in SCALE," *Trans. Am. Nucl. Soc*. **109**, 739-742 **(**2013).

104. B. T. Rearden, et al, "SCALE and AMPX Advancements to Support NCS Applications," *Trans. Am. Nucl. Soc*. **109**, 907-910 (2013).

105. I. Hill, J. Gulliford, J. B. Briggs, B. T. Rearden, and T. Ivanova, " Generation of 1800 New Sensitivity Data Files for ICSBEP using SCALE 6.0," *Trans. Am. Nucl. Soc*. **109**, 867-869 (2013).

106. S. W. D. Hart, G. I. Maldonado, S. Goluoglu, and B. T. Rearden, "Implementation of the Doppler Broadening Rejection Correction in KENO," *Trans. Am. Nucl. Soc.* **108**, 423-425 (2013).

107. C. M. Perfetti, W. R. Martin, B. T. Rearden, and W. L. Williams, "Advanced Methods for Eigenvalue Sensitivity Coefficient Calculations," *Trans. Am. Nucl. Soc*. **107**, 575-578 (2012).

108. B. T. Rearden and W. J. Marshall, "Examination of Validation Outlier Cases Using the Sensitivity and Uncertainty Analysis Tools of SCALE 6.1," *Trans. Am. Nucl. Soc*. **106**, 461-464 (2012).

109. W. J. Marshall and B. T. Rearden, "Criticality Safety Validation of SCALE 6.1 with ENDF/B-VII.0 Libraries," *Trans. Am. Nucl. Soc*. **106**, 456-460 (2012).

110. B. T. Rearden, D. A. Reed, R. A. Lefebvre, D. E. Mueller, and W. J. Marshall, "SCALE/TSUNAMI Sensitivity Data for ICSBEP Evaluations," *Proc. ICNC 2011*, Edinburgh, U.K., September 19-22, 2011.

111. B. T. Rearden, L. M. Petrie, D. E. Peplow, M. A. Jessee, D. Wiarda, M. L. Williams, R. A. Lefebvre, J. P. Lefebvre, I. C. Gauld, and S. Goluoglu, "SCALE 6.1 Enhancements for Nuclear Criticality Safety," *Proc. ICNC 2011*, Edinburgh, U.K., September 19-22, 2011.

112. B. T. Rearden and D. E. Mueller, "Uncertainty Quantification Techniques of SCALE/TSUNAMI," *Trans. Am. Nucl. Soc*. **104**, 371-373 (2011).

113. M. L. Williams and B. T. Rearden, "Self-Shielding Effects for Uncertainty Analysis," *Trans. Am. Nucl. Soc.* **104**, 799-801 (2011).

114. J. D. Bess, K. C. Bledsoe, and B. T. Rearden, "Evaluation of HEU-Beryllium Benchmark Experiments to Improve Computational Analysis of Space Reactors," *Proc. Nuclear and Emergency Technologies for Space 2011*, Paper 3485, Albuquerque, NM, February 7-10, 2011.

115. B. T. Rearden, "Enhancements in SCALE 6.1," *Trans. Am. Nucl. Soc.* **103**, 412-414 (2010).

116. B. T. Rearden and D. E. Mueller, "Bias Assessment of ^{233}U Systems Using SCALE TSURFER," *Trans. Am. Nucl. Soc.* **102**, 307-311 (2010).

117. B. T. Rearden, "Verification Methods for the SCALE Code System," *Proc. Verification and Validation for Nuclear Systems Analysis Workshop II*, North Myrtle Beach, SC, May 24-28, 2010.

118. T. Ivanova, F. Fernex, E. Kolbe, A. Vasiliev, G. S. Lee, S. W. Woo, D. Mennerdahl, Y. Nagaya, J.-C. Neuber, A. Hoefer, B. Rearden, D. Mueller, Y. Rugama, A. Santamarina, C. Venard, A. Tsiboulia, Y. Golovko, "OECD/NEA Expert Group on Uncertainty Analysis for Criticality Safety

Assessment: Current Activities," *Proc. PHYSOR 2010, Advances in Reactor Physics to Power the Nuclear Renaissance*, Sheraton Station Square Hotel, Pittsburgh, PA, May 9-14, 2010.

119. D. E. Mueller and B. T. Rearden, "SCALE TSUNAMI Analysis of Critical Experiments for the Validation of ^{233}U System," *Trans. Am. Nucl. Soc.* **101**, 455-459 (2009).

120. B. T. Rearden and D. E. Mueller, "Using Cross-Section Uncertainty Data to Estimate Biases," *Trans. Am. Nucl. Soc.* **99**, 389-390 (2008).

121. A. M. Fleckenstein and B. T. Rearden, "Extensible SCALE Intelligent Text Editor - ExSITE," *Trans. Am. Nucl. Soc*. **98**, 223-226 (2008).

122. B. T. Rearden, "TSUNAMI Sensitivity and Uncertainty Analysis Capabilities in SCALE 5.1," *Trans. Am. Nucl. Soc*. **97**, 604-605 (2007).

123. B. T. Rearden and M. L. Williams, "Overview of the SCALE TSUNAMI Sensitivity and Uncertainty Analysis Tools," *Trans. Am. Nucl. Soc*. **96**, 535-537 (2007).

124. A. M. Fleckenstein and B. T. Rearden, "Multigroup Cross Section and Cross Section Covariance Data Visualization with Javapeño," *Trans. Am. Nucl. Soc.* **95**, 292-295 (2006).

125. B. T. Rearden, "A Criticality Code Validation Exercise for a LEU Lattice," *Trans. Am. Nucl. Soc.* **95**, 381-386 (2006).

126. B. T. Rearden and J. E. Horwedel, "Automatic Differentiation to Couple SCALE Modules Using GRESS 90--Part II: Application," *Trans. Am. Nucl. Soc.* **95**, 702-705 (2006).

127. B. T. Rearden, M. L. Williams and J. E. Horwedel, "Advances in the TSUNAMI Sensitivity and Uncertainty Analysis Codes Beyond SCALE 5," *Trans. Am. Nucl. Soc.* **92**, 760-762 (2005).

128. S. Goluoglu, K. R. Elam, B. T. Rearden, B. L. Broadhead, C. M. Hopper, and C.V. Parks, "Validation of the 10B Capture Reaction in Nuclear Fuel Casks with Sensitivity Analysis," *Trans. Am. Nucl. Soc*. **89**, 134-135 (2003).

129. S. Goluoglu, C. M. Hopper, and B. T. Rearden, "Extended Interpretation of Sensitivity Data for Benchmark Areas of Applicability," *Trans. Am. Nucl. Soc*. **88**, 77-79 (2003).

130. S. M. Bowman, D. F. Hollenbach, M. D. DeHart, B. T. Rearden, I. C. Gauld and S. Goluoglu, "An Overview of What's New in SCALE 5," *Trans. Am. Nucl. Soc*. **87**, 265–268 (2002).

131. D. F. Hollenbach, L. M. Petrie, B. T. Rearden, and S. M. Bowman, "KENO Postprocessor Analysis and Plotting Capabilities," *Trans. Am. Nucl. Soc.* **87**, 270–272 (2002).

132. B. T. Rearden and D. E. Peplow, "Comparison of Sensitivity Analysis Techniques in Monte Carlo Codes for Multi- Region Criticality Calculations," *Trans. Am. Nucl. Soc.* **85**, 163-165 (2001).

133. B. L. Broadhead and B. T. Rearden, "Foundations for Sensitivity Based Criticality Validation Techniques," *Trans. Am. Nucl. Soc.* **83**, 93-95 (2000).

134. B. T. Rearden and R. L. Childs, "Prototypical Sensitivity and Uncertainty Analysis Codes for Criticality Safety with the SCALE Code System," *Trans. Am. Nucl. Soc.* **83**, 98-100 (2000).

135. B. T. Rearden, C. M. Hopper, K. R. Elam, B. L. Broadhead, and P. B. Fox, "Prototypic Applications of Sensitivity and Uncertainty Analysis for Experiment Needs," *Trans. Am. Nucl. Soc.* **83**, 103-107 (2000).

136. B. L. Broadhead, C. M. Hopper, K. R. Elam, B. T. Rearden, and R. L. Childs, "Criticality Safety Applications of S/U Validation Methods," *Trans. Am. Nucl. Soc.* **83**, 107-113 (2000).

137. B. T. Rearden, T. A. Parish. and W. S. Charlton, "Generation of Two-Group Cross Sections for WG-MOX Fuel Using MCNP," *Trans. Am. Nucl. Soc.*, **77**, 323 (1997).

138. B. T. Rearden, "An Engineering Analysis of a Power Upgrade for the Texas A&M Nuclear Science Center Reactor," *Trans. Am. Nucl. Soc.*, **73**, 411 (1995).