

William Jay (B.J.) Marshall

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EDUCATION

University of Tennessee-Knoxville

Master of Science in Nuclear Engineering, August 2001

Thesis: "Control Blade Redesign at the High Flux Isotope Reactor"

Graduate GPA: 3.72/4.0

University of Missouri-Rolla

Bachelor of Science in Nuclear Engineering, December 1999 (Cum Laude)

Undergraduate GPA: 3.41/4.0

University of Tennessee-Knoxville

Additional graduate class work, Deterministic and Monte Carlo Transport Theory

WORK EXPERIENCE

June 2010–

Present

R&D Staff

Nuclear Data and Criticality Safety Group; Reactor and Nuclear Systems Division, Oak Ridge National Laboratory, Oak Ridge, TN

- Perform research supporting burnup credit basis for PWR and BWR SNF
- Assist with delivery of SCALE training, Lead for SCALE Training team
- Test SCALE criticality safety and nuclear data developments

November 2008–

May 2010

Product Manager/Lead Engineer

Westinghouse Electric Company

- Provided technical leadership to spent fuel pool criticality safety product line
- Participated in industry-wide NEI forum with NRC
- Assisted in development of bids and proposals
- Supervised work on new analysis and licensing support for past analyses
- Developed and delivered SFP NCS training with other qualified personnel

July 2006–

October 2008

Senior Core Design Engineer

Westinghouse Electric Company

- Performed and verified PWR core reload analyses
- Assisted development of improved modeling techniques
- Executed criticality safety analyses
- Mentored new employees in core design and criticality safety

WORK EXPERIENCE (continued)

November 2001–

July 2006

Design Engineer

Knolls Atomic Power Laboratory

- Assisted in new reactor designs
- Performed 2D and 3D Monte Carlo calculations
- Carried out nodal synthesis calculations
- Helped develop and provide RACER Monte Carlo code training

January 2000–

August 2001

Graduate Research Assistant

University of Tennessee

- Performed research on High Flux Isotope Reactor
- Used SCALE and DORT for core modeling
- Lectured on MCNP4 at Tennessee Industries Week

June 1999–

August 1999

Summer Intern

Oak Ridge National Laboratory

- Used MCNP4 For shielding benchmark
- Upgraded NRC code HABIT

September 1998–

December 1999

Student Health Physics Technician

University of Missouri-Rolla

- Performed radiation and contamination surveys
- Performed meter and dosimeter calibrations

PUBLICATIONS

W.J. Marshall, B.J. Ade, S.M. Bowman, I.C. Gauld, G. Ilas, U. Mertyurek, G. Radulescu, “Technical Basis for Peak Reactivity Burnup Credit for BWR Spent Nuclear Fuel in Storage and Transportation Systems,” *Proceedings of International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13 – 17, 2015.

W.J. Marshall and B.T. Rearden, “Determination of Critical Experiment Correlations Using the Sampler Sequence Within SCALE 6.2,” *Proceedings of International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13 – 17, 2015.

W.J. Marshall, B.T. Rearden, and E.L. Jones, “Validation of SCALE 6.2 Criticality Calculations Using KENO V.A and KENO-VI,” *Proceedings of International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13 – 17, 2015.

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,” *Proceedings of International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13 – 17, 2015.

PUBLICATIONS (continued)

D.E. Mueller, D.G. Bowen, and W.J. Marshall, "Addressing Fission Product Validation in MCNP Burnup Credit Criticality Calculations," *Proceedings of International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13 – 17, 2015.

V. Sobes, B.T. Rearden, D.E. Mueller, W.J. Marshall, J.M. Scaglione, M.E. Dunn, "Upper Subcritical Calculations Based on Correlated Data," *Proceedings of International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13 – 17, 2015.

J.S. Martinez-Gonzalez, B.J. Ade, S.M. Bowman, I.C. Gauld, G. Ilas, W.J. Marshall, "Impact of modeling Choices on Inventory and In-Cask Criticality Calculations for Forsmark3 BWR Spent Fuel," *Proceedings of International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13 – 17, 2015.

B.J. Ade, W.J. Marshall, S.M. Bowman, I.C. Gauld, G. Ilas, and J.S. Martinez-Gonzalez, "Coolant Density and Control Blade History Effects in Extended BWR Burnup Credit," *Proceedings of International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13 – 17, 2015.

B.T. Rearden, K.B. Bekar, C. Celik, K.T. Clarno, M.E. Dunn, S.W.D. Hart, A.M. Ibrahim, S.R. Johnson, B.R. Langley, J.P. Lefebvre, R.A. Lefebvre, W.J. Marshall, U. Mertyurek, D.E. Mueller, D.E. Peplow, C.M. Perfetti, L.M. Petrie Jr., A.B. Thompson, D. Wiarda, W.A. Wieselquist, and M.L. Williams, "Criticality Safety Enhancements For Scale 6.2 And Beyond," *Proceedings of International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13 – 17, 2015.

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," *Proceedings of International Conference on Nuclear Criticality Safety*, Charlotte, NC, September 13 – 17, 2015.

D. E. Mueller, W. J. Marshall, D. G. Bowen, and J. C. Wagner, "Bias Estimates in Lieu of Validation of Fission Products and Minor Actinides in MCNP k_{eff} Calculations for PWR Burnup Credit Casks," NUREG/CR-7205 (ORNL/TM-2012/544), prepared for the U. S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., September, 2015.

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).

J. M. Scaglione, G. Radulescu, W. J. Marshall, and K. R. Robb, "A Quantitative Impact Assessment of Hypothetical Spent Fuel Reconfiguration in Spent Fuel Storage Casks and Transportation Packages," NUREG/CR-7203 (ORNL/TM-2013/92), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., May 2015.

W. J. Marshall, B. J. Ade, S. M. Bowman, I. C. Gauld, G. Ilas, U. Mertyurek, and G. Radulescu, "Technical Basis for Peak Reactivity Burnup Credit for BWR Spent Nuclear Fuel in Storage and Transportation Systems," NUREG/CR-7194 (ORNL/TM-2014/240), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., April 2015.

W. J. Marshall and B. T. Rearden, "Determination of Experimental Correlations Using the Sampler Sequence Within SCALE 6.2," *Trans. Am. Nucl. Soc.* **111**, 867-870 (2014).

W. J. Marshall and S. M. Bowman, "Validation of k_{eff} Calculations for Boiling-Water Reactor Fuel at Peak Reactivity in Transportation and Storage Casks," *Trans. Am. Nucl. Soc.* **111**, 883-886 (2014).

PUBLICATIONS (continued)

W. J. Marshall, B. J. Ade, and S. M. Bowman, "Evaluation of Peak Reactivity Analysis of Boiling-Water Reactor Fuel in Storage and Transportation Casks," *Trans. Am. Nucl. Soc.* **111**, 875-878 (2014).

E. L. Jones, G. I. Maldonado and W. J. Marshall, "Mixed Uranium-Plutonium Solution Validation of KENO V.a and KENO-VI in SCALE 6.1.2 and 6.2b3 Using Multigroup and Continuous-Energy ENDF/B-VII.0 Libraries," *Trans. Am. Nucl. Soc.* **111**, 857-860 (2014).

J. M. Scaglione, G. Radulescu, K. R. Robb, and W. J. Marshall, "Consequence Assessment of Fuel Reconfiguration for Dry Storage and Transportation Packages," *Trans. Am. Nucl. Soc.* **111**, 330-333 (2014).

M. L. Williams, D. Wiarda, G. Ilas, W. J. Marshall, B. T. Rearden, "Covariance Applications in Criticality Safety, Light Water Reactor Analysis, and Spent Fuel Characterization," *Nucl. Data Sheets*, **123**, 92 – 96, January 2015.

W. J. Marshall, S. Croft, I. C. Gauld, J. Hu, C. E. Romano, A. Worrall, "Special Nuclear Material Inventory Processes at US Domestic Power Plants," *55th Annual Meeting of the Institute of Nuclear Materials Management*, Atlanta, GA, July 20 – 25, 2014.

M. L. Williams, G. Ilas, W.J. Marshall, and B. T. Rearden, "Applications of Nuclear Data Covariances to Criticality Safety and Spent Fuel Characterization," *Nucl. Data Sheets*, **118**, 341 – 345, April 2014.

W. J. Marshall and J. C. Wagner, "Additional Studies of the Criticality Safety of Failed Used Nuclear Fuel," *Packaging, Transport, Storage and Security of Radioactive Materials*, **25**(1), 1 – 7, March 2014.

W. J. Marshall, D. Wiarda, C. Celik, B. T. Rearden and D. R. Wentz, "Validation of Criticality Safety Calculations with SCALE 6.2," *Proceedings of NCS D 2013: Criticality Safety in the Modern Era – Raising the Bar*, Wilmington, NC, September 29 – October 3, 2013.

W. J. Marshall and B. T. Rearden, "The SCALE Verified Archived Library of Inputs and Data – VALID," *Proceedings of NCS D 2013: Criticality Safety in the Modern Era – Raising the Bar*, Wilmington, NC, September 29 – October 3, 2013.

W. J. Marshall and J. C. Wagner, "Additional Studies of the Criticality Safety of Failed Used Nuclear Fuel," *Proceedings of the 17th International Symposium on the Packaging and Transportation of Radioactive Materials (PATRAM 2013)*, San Francisco California, August 18 – 23, 2013.

J. M. Scaglione, G. Radulescu, K. R. Robb, W. J. Marshall, J. C. Wagner, M. Flanagan, M. Aissa, Z. Li, "Consequence Analysis of Spent Nuclear Fuel Reconfiguration Scenarios," *Proceedings of the 17th International Symposium on the Packaging and Transportation of Radioactive Materials (PATRAM 2013)*, San Francisco California, August 18 – 23, 2013.

J. M. Scaglione, K. R. Robb, R. A. Lefebvre, D. Ilas, G. Radulescu, W. J. Marshall, J. C. Wagner, H. E. Adkins, T. E. Michener, D. Vinson, "Integrated Data and Analysis System for Commercial Used Nuclear Fuel Safety Assessments," *Proceedings of the 17th International Symposium on the Packaging and Transportation of Radioactive Materials (PATRAM 2013)*, San Francisco California, August 18 – 23, 2013.

W. J. Marshall and J. C. Wagner, "Consequences of Used Nuclear Fuel Failure on Criticality Safety,"

PUBLICATIONS (continued)

Proceedings of International High-Level Radioactive Waste Management, Albuquerque, NM, April 28 – May 3, 2013.

M. L. Williams, G. Ilas, W. J. Marshall, and B. T. Rearden, “Applications of Nuclear Data Covariances to Criticality Safety and Spent Fuel Characterization,” *Proceedings of the International Conference on Nuclear Data for Science and Technology*, New York, NY, March 4 – 8, 2013.

W. J. Marshall and B. T. Rearden, *Criticality Safety Validation of SCALE 6.1*, ORNL/TM-2011/450 (Revised), Oak Ridge, Tenn., January 2103.

W. J. Marshall and J. C. Wagner, *Consequences of Fuel Failure on Criticality Safety of Used Nuclear Fuel*, ORNL/TM-2012/325, Oak Ridge, Tenn., April 2013.

D. E. Mueller, S. M. Bowman, W. J. Marshall, and J. M. Scaglione, *Review and Prioritization of Technical Issues Related to Burnup Credit for BWR Fuel*, NUREG/CR-7158 (ORNL/TM-2012/261), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., February 2013.

W. J. Marshall and J. C. Wagner, “Impact of Fuel Failure on Criticality Safety of Used Nuclear Fuel,” *Proceedings of PSAM11*, Helsinki, Finland, June 25-29, 2012.

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).

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).

J. M. Scaglione, D. E. Mueller, J. C. Wagner, and W. J. Marshall, *An Approach for Validating Actinide and Fission Product Burnup Credit Criticality Safety Analyses-Criticality (k_{eff}) Predictions*, NUREG/CR-7109 (ORNL/TM-2011/514), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., April 2012.

V. Kucukboyaci and B. J. Marshall, “Spent Fuel Pool Storage Calculations Using the ISOCRIT Burnup Credit Tool,” *Annals of Nucl. Energy* **39**(1), 9-14, January 2012.

B. T. Rearden, D. A. Reed, R. A. Lefebvre, D. Mueller, and W. J. Marshall, “Scale/TSUNAMI Sensitivity Data for ICSBEP Evaluations,” in *Proceedings of ICNC 2011*, Edinburgh, Scotland, September 19-23, 2011.

V. N. Kucukboyaci and W. J. Marshall, “ISOCRIT: A Burnup Credit Tool for Spent Fuel Pool Storage Calculations,” *Proc. PHYSOR 2010*, Pittsburgh, PA, May 9-14, 2010.

V. N. Kucukboyaci, W. J. Marshall, and M. G. Anness, “Criticality Calculations Supporting PWR Spent Fuel Pool Activities,” *Trans. Am. Nucl. Soc.* **97**, 161-163 (2007).

R. E. Pevey, L. F. Miller, W. J. Marshall, L. W. Townsend, and B. Alvord, “Coarse-Mesh Adjoint Biasing of a Monte Carlo Dose Calculation,” *J. ASTM International* **3**(7), July 2006.

R. Pevey, L. F. Miller, B. J. Marshall, L. W. Townsend, and B. Alvord, “Shielding for a Cyclotron Used for Medical Isotope Production in China,” *Radiat. Prot. Dosim.* **115**, 415-419 (2005).

PUBLICATIONS (continued)

R. Pevey, L. F. Miller, B. J. Marshall, L. W. Townsend, and B. Alvord, "Efficacy of Three-Dimensional Adjoint Biasing for a Cyclotron used for Medical Isotope Production in China," in *Proceedings of the 12th International Symposium on Reactor Dosimetry*, Gatlinburg, TN, May 2005.

B. J. Marshall and L. F. Miller, "Power Distribution Calculations for Various Tantalum Loadings in the HFIR Control Blades," in *Transactions of the American Nuclear Society 2001 Annual Meeting*, Milwaukee, Wisconsin, June 17-21, 2001.

H. T. Hunter, C. O. Slater, L. B. Holland, G. Tracz, W. J. Marshall, and J. L. Parsons, "Shielding Benchmark Computational Analysis," *Proceedings of Radiation Protection for Our National Priorities*, 240-247 (2000).

H. T. Hunter, J. L. Parsons, W. J. Marshall, E. Sartori, and I. Kodeli, "Shielding Experimental Benchmark Storage, Retrieval, and Display System," *Proceedings of ICRS-9*, Ibaraki, Japan, October 17-22, 1999.