

JOHN M. SCAGLIONE

Oak Ridge National Laboratory
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- SUMMARY** Experienced in the development and use of computational methods for criticality safety, radiation shielding, and reactor analysis; particular expertise in spent fuel disposal for Department of Energy (DOE) owned and commercial spent nuclear fuel and high level waste, burnup credit criticality safety for spent fuel disposal, and computational validation. Experience in performing, documenting, and reviewing complex analyses, and license application safety analysis report development.
- EDUCATION**
- UNIVERSITY OF FLORIDA, Gainesville, FL
Master of Engineering in Nuclear Engineering, December 1997
Concentration on high burnup fuel cycle and radiation interactions
(Member of Alpha Nu Sigma [National Honor Society])
- UNIVERSITY OF FLORIDA, Gainesville, FL
Bachelor of Science in Nuclear Engineering, August 1996
Concentration on power reactor physics, thermal-hydraulic design, and nuclear fuel management
- EXPERIENCE**
- Oak Ridge National Laboratory (ORNL), Oak Ridge, TN**
Used Fuel Research, Development, and Demonstration
Reactor and Nuclear Systems Division
Supervisor: Dr. John C. Wagner
- August 2010-
present *Research and Development Staff*
Provide general nuclear engineering and criticality safety support to the Nuclear Regulatory Commission (NRC) and Department of Energy (DOE) Office of Nuclear Energy. Support includes: assisting NRC Office of Nuclear Reactor Regulation in revisions of Standard Review Plan Chapter 11, Radioactive Waste Management for advanced reactor licensing reviews; assisting NRC Office of Nuclear Regulatory Research by performing and reviewing analyses for spent fuel pool and generic cask burnup credit; and supporting DOE-NE Used Fuel Disposition Campaign to develop the technical basis ensuring the safety and security of long-term storage, transportation, and disposal of used nuclear fuel and high-level wastes.
- September 2008-
July 2010 *Project Manager*
On assignment to the DOE Office of Civilian Radioactive Waste Management's (OCRWM) Lead Laboratory for Repository Systems as Senior Manager for postclosure criticality safety technical integration at the Yucca Mountain Project (YMP). Responsibilities included license application defense and maintenance of the postclosure criticality licensing basis for DOE-owned spent nuclear fuel (SNF), high-level waste, and commercial SNF; developing, planning, and coordination of work scope with the National Spent Nuclear Fuel Program

and the Naval Nuclear Propulsion Program; managing work activities and interfacing with the customer (DOE OCRWM), regulator, and other relevant stakeholders.

Beckman & Associates, 1180 Town Center Drive, Las Vegas, NV
OCRWM Lead Laboratory for Repository Systems
Supervisor: Cliff Howard

April 2007-
September 2008

Technical Sciences Group Manager

October 2006-
March 2007

Nuclear Criticality Analyst

Managed approximately 6 staff working in support of nuclear criticality analyses operations in Las Vegas. Integrated functions between multiple organizations to ensure consistency of design, boundary conditions, and scenario descriptions to support Safety Analysis Report section development. Ensured products met the applicable regulations, DOE Orders, and consensus standard objectives, and were developed within scope, schedule, and budget plans. Interacted with the DOE customer and NRC staff. Coordinated and adjusted work scope as needed with Naval Nuclear Propulsion Program and subcontractors. Cultivated staff to constitute witness pools for license defense and to comprehend a nuclear culture work environment. Reviewed models and analyses for technical adequacy and integration with criticality control objectives for long-term storage of nuclear waste in a geologic repository. Co-authored Yucca Mountain Project license application Safety Analysis Report sections involving the application of burnup credit, defensibility of applicable code biases and uncertainties regarding isotopic compositions and cross sections for reactivity evaluations, development of robust arguments for canister and configuration design variants, and a probabilistic assessment of the occurrence of a nuclear criticality event in the repository. Developed analyses regarding igneous and seismic scenario development considering the processes that affect mechanical impacts, material corrosion and sensitization, waste form degradation, and the combined effects on the parameters important for nuclear criticality. Qualified SCALE and MCNP computer code packages in accordance with stringent QA program requirements.

Bechtel SAIC Company, LLC; 1180 Town Center Drive, Las Vegas, NV
Yucca Mountain Project
Licensing & Nuclear Safety Criticality Department
Supervisors: Doug Brownson, William Hutchins, Abdelhalim Alsaed

October 2005-
September 2006

Postclosure Criticality Lead

September 2004-
October 2005

Commercial Spent Nuclear Fuel Lead

February 2001-
September 2004

Senior Engineer

Criticality Department manager delegate. Coordinated and facilitated meetings with national laboratory personnel. Developed and presented presentations to NRC, national laboratory personnel, and DOE customer. Developed and reviewed criticality, shielding, and nuclear related technical products, and ensured that they are compliant with specified requirements. Extensive use of the SCALE and MCNP code systems in the evaluation of numerous configurations. Integrated work with other departments. Guided personnel assigned to projects. Implemented and monitored subcontractor work direction. Acted as subcontract technical representative and served as technical specialist for supplier audits. Leader for all aspects concerning commercial fuel and burnup credit analyses related to the development of improved or advanced concepts. Primary responsibilities included performing assignments independently, developing new approaches to problems, mentoring other staff members, developing work plans, and being knowledgeable of the consensus standards and regulations pertaining to criticality safety.

Framatome Cogema Fuels, 1180 Town Center Drive, Las Vegas NV
Yucca Mountain Project
Supervisor: Dan Thomas

February 1998-
February 2001

Engineer III, Government Relations Department

Primary responsibilities included extensive use of the SCALE and MCNP code systems in simulating commercial reactor core behavior, and development and review of criticality and shielding safety analyses for various configurations. Used strong analytical skills to solve problems independently, and delivered high-quality defensible documents on or ahead of schedule.

University of Florida, Gainesville, FL
Department of Nuclear and Radiological Engineering
Advisor: Professor James Tulenko

August 1996-
January 1998

Computer code generation of data and spreadsheet manipulation evaluating new design considerations for extending fuel cycle length and associated economics.

Framatome Technologies, 3315 Old Forest Road, Lynchburg VA
Fuel Engineering Division
Supervisor: Scott Robertson

Summer 1997

Intern

Used CASMO-NEMO code package and MCNP-4B to simulate reactor core operations modeling abnormal operating behavior and performed data analysis investigating cause of early fuel rod failure.

University of Florida, Gainesville, FL
Environmental Health and Safety Division

April 1996-
September 1996

Radiation Control Technician

Calibration of radiation detectors, environmental surveys, room surveys, decontamination of radioactive areas, and assisting in various projects involving the University of Florida Training Reactor

COMPUTER SKILLS Windows, UNIX, Spreadsheet programs, Wordprocessors, PowerPoint, Internet Programming: FORTRAN, C, Turbo C++, Pascal, LabView

Code Experience: MCNP, SCALE, SAPHIRE, CASMO, SIMULATE, NEMO, COBRA, COMBINE, VENTURE, BRT, PHROG, CORA, EASCYC, EASCOST, NFUEL

CERTIFICATES AND MEMBERSHIPS Certified as an Engineer Intern by the Florida State Board of Professional Engineers
Certified Six Sigma Yellow Belt
L Security Clearance

REFERENCES Available upon request

PUBLICATIONS

J. M. Scaglione, G. Radulescu, K. R. Robb, W. J. Marshall, J. C. Wagner, M. Glanagan, M. Aissa, and Z. Li, "Consequence Analysis of Spent Nuclear Fuel Reconfiguration Scenarios," in *Proceedings of PATRAM 2013*, San Francisco, CA, August 18-23, 2013.

J. M. Scaglione, R. A. Lefebvre, K. R. Robb, J. L. Peterson, H. Adkins, T. E. Michener, and D. Vinson, "Integrated Data and Analysis System for Commercial Used Nuclear Fuel Safety Assessments" in *Proceedings of PATRAM 2013*, San Francisco, CA, August 18-23, 2013.

J. M. Scaglione, A. Caswell, and G. Radulescu, "Considerations for an Integrated Storage, Transportation, and Disposal Canister," in *Proceedings of the 14th International High-Level Radioactive Waste Management Conference (IHLRWMC)*, Albuquerque, NM, April 28-May 2, 2013.

J. M. Scaglione, R. A. Lefebvre, G. Radulescu, H. J. Smith, D. Ilas, K. R. Robb, and J. C. Wagner, "Integrating Data and Analysis Capabilities for Cask-Specific Safety Evaluations," in *Proceedings of the 14th International High-Level Radioactive Waste Management Conference (IHLRWMC)*, Albuquerque, NM, April 28-May 2, 2013.

A. M. Beville, G. Radulescu, J. M. Scaglione, and R. L. Howard, "ADVANTG Shielding Analysis for Closure Operations in an Open-Mode Repository," in *Proceedings of the 14th International High-Level Radioactive Waste Management Conference (IHLRWMC)*, Albuquerque, NM, April 28-May 2, 2013.

D. E. Mueller, J. M. Scaglione, J. C. Wagner, and S. M. Bowman, *Computational Benchmark for Estimated Reactivity Margin from Fission Products and Minor Actinides in BWR Burnup Credit*, NUREG/CR-7157 (ORNL/TM-2012/96), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., February 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.

G. T. Mays, R. Belles, M. S. Cetiner, R. L. Howard, C. Liu, D. Mueller, O. A. Omitaomu, S. K. Peterson, and J. M. Scaglione, *Application of Spatial Data Modeling Systems, Geographical Information Systems (GIS), and Transportation Routing Optimization Methods for Evaluating Integrated Deployment of Interim Spent Fuel Storage Installations and Advanced Nuclear Plants*, ORNL/TM-2012/237, Oak Ridge National Laboratory, Oak Ridge, Tenn., June 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.

J. M. Scaglione, D. E. Mueller, and J. C. Wagner, "An Approach for Validating Actinide and Fission Product Burnup Credit Criticality Safety Analyses--Criticality (k_{eff}) Predictions," *Proceedings of ICNC 2011*, Edinburgh, Scotland, September 19-23, 2011.

J. M. Scaglione and J. C. Wagner, "Review of Yucca Mountain Disposal Criticality Studies," *Proceedings of the International High-Level Radioactive Waste Management Meeting*, Albuquerque, NM, April 10-14, 2011.

J. M. Scaglione and J. C. Wagner, "Burnup Credit Approach for the Proposed United States Repository at Yucca Mountain," *Proceedings of the IAEA/CSN International Workshop on Advances in Applications of Burnup Credit for Spent Fuel Storage, Transport, Reprocessing, and Disposition*, Cordoba, Spain, October 27-30, 2009.

A. H. Wells and J. M. Scaglione, "Burnup Credit Isotopic Validation with Commercial Reactor Criticals," *Trans. Am. Nucl. Soc.* **88** (2003).

J. M. Scaglione, "Isotopic Bias and Uncertainty for Burnup Credit Applications," *Trans. Am. Nucl. Soc.* **87**, 105-107 (2002).

J. M. Scaglione, "Spent Fuel Criticality Benchmark Experiments," *Proceedings of 2001 ANS Embedded Topical Meeting on Practical Implementation of Nuclear Criticality Safety*, Reno, Nevada, November 11-15, 2001.

P. M. O'Leary and J. M. Scaglione, "An Empirical Approach to Bounding the Axial Reactivity Effects of PWR Spent Nuclear Fuel," *Trans. Am. Nucl. Soc.* **84**, 352-353 (2001).

J. M. Scaglione et al. "Applicability of CRC Benchmark Experiments for Burnup Credit Applications," *Trans. Am. Nucl. Soc.* **83**, 138-139 (2000).

W. J. Anderson, P. M. O'Leary, and J. M. Scaglione, "Selection of Reactor Criticals as Benchmarks for Spent Nuclear Fuels," *Trans. Am. Nucl. Soc.* **83**, 140-141 (2000).

J. S. Tulenko, G. Schoessow, and J. M. Scaglione, "A New Fuel Rod Design for Ultra High Burnup Cycles," *ICONE 5: Proceedings of the 5th International Conference on Nuclear Engineering*, Nice, France, May 26-30, 1997.

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C. T. Hsu and J. M. Scaglione, *PWR Radial Burnup Gradient Reactivity Evaluation*. ANL-DSC-NU-000001 REV 000. Las Vegas, Nevada: Sandia National Laboratories (2007).

J. M. Scaglione, *Commercial Spent Nuclear Fuel Igneous Scenario Criticality Evaluation*. ANL-EBS-NU-000009 REV 00. Las Vegas, Nevada: Sandia National Laboratories (2007).

A. H. Wells and J. M. Scaglione, *Reactivity Effects of Isotopic Uncertainty for Burnup Credit Validation*. 000-00C-WHS0-01500-000-00A. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2006).

H. R. Radulescu and J. M. Scaglione, *Criticality Calculation for 21-PWR Waste Package Configuration for Underburned Assemblies*. CAL-DSU-NU-000015 REV 0A. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2005).

J. M. Scaglione, *21-PWR Site-Specific Canister Loading Curve Evaluation*. 000-00C-HA00-00200-000-00A. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2005).

H. R. Radulescu and J. M. Scaglione, *CSNF Assembly Type Sensitivity Evaluation for Pre- and Postclosure Criticality Analysis*. CAL-DSU-NU-000013 REV 00A. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2005).

J. M. Scaglione, *21-PWR Waste Package Probability of Criticality Due to Misload*. CAL-DSU-NU-000014 REV 00A. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2005).

A. H. Well, J. E. Huffer, and J. M. Scaglione, *Isotopic Model for Commercial SNF Burnup Credit*. CAL-DSU-NU-000007 REV 00B. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2004).

J. M. Scaglione, *44-BWR Waste Package Loading Curve Evaluation*. CAL-DSU-NU-000008 REV 00A. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2004).

J. M. Scaglione, *21 PWR Waste Package With Absorber Plates Loading Curve Evaluation*. CAL-DSU-NU-000006 REV 00C. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2004).

J. Huffer, and J. M. Scaglione, *Calculation of Isotopic bias and Uncertainty for BWR SNF*. CAL-DSU-NU-000003 REV 00A. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2003).

J. M. Scaglione, *Preclosure Criticality Analysis Process Report*. TDR-EBS-NU-000004 REV 01. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2003).

J. M. Scaglione, *Criticality Model Report*. MDL-EBS-NU-000003 REV 01. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2003).

J. M. Scaglione, *PWR Axial Burnup Profile Analysis*. CAL-DSU-NU-000012 REV 00A. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2003).

J. M. Scaglione, *Three Mile Island Unit 1 Radiochemical Assay Comparisons to SAS2H Calculations*. CAL-UDC-NU-000011 REV A. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2002).

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J. M. Scaglione, *21 PWR Waste Package Variable Spent Nuclear Fuel Loading Evaluation*. CAL-UDC-NU-000008 REV 00. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2001).

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D. A. Salmon and J. M. Scaglione, *CRC Reactivity Calculations for Quad Cities Unit 2*. B00000000-01717-0210-00010 REV 01. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (1999).

J. M. Scaglione, *CRC Depletion Calculations for Crystal River Unit 3*. B00000000-01717-0210-00001 REV 00. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (1998).

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K. D. Wright and J. M. Scaglione, *CRC Reactivity Calculations for Three Mile Island Unit 1*. B00000000-01717-0210-00008 REV 00. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (1998).

J. M. Scaglione, *CRC Reactivity Calculations for Crystal River Unit 3*. B00000000-01717-0210-00002 REV 00. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (1998).

J. M. Scaglione, *CRC Reactivity Calculations for Sequoyah Unit 2*. B00000000-01717-0210-00006 REV 00. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (1998).

J. M. Scaglione, *Sequoyah Unit 2 CRC Depletion Calculations*. B00000000-01717-0210-00005 REV 00. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (1998).

J. M. Scaglione, *CRC Depletion Calculations for Crystal River Unit 3*. B00000000-01717-0210-00001 REV 00. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (1998).