

Burnup Credit Related Publications

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NOTICE:

The following is a list of nearly 200 publications that are either directly or indirectly related to burnup credit and criticality safety for spent nuclear fuel. The list will hopefully provide a useful resource of previous works to those working in burnup credit. The list was compiled by the staff of the Reactor and Nuclear Systems Division at Oak Ridge National Laboratory (ORNL) as a byproduct of several burnup credit research projects. While extensive, the list is not exhaustive. It is our intention to expand and maintain the list as additional relevant publications come to our attention. Suggestions for additions and/or modifications are welcome and should be directed to scaglionejm@ornl.gov. Finally, note that the presence or absence of a publication in this list should not be construed as an indication of approval or disapproval of the quality or technical merit of the publication.

Burnup Credit Related Publications

2016

William (B. J.) Marshall, Brian J. Ade, Stephen Bowman, and Jesus S. Martinez-Gonzalez, [*Axial Moderator Density Distributions, Control Blade Usage, and Axial Burnup Distributions for Extended BWR Burnup Credit*](#), NUREG/CR-7224 (ORNL/TM-2015/544), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, August 2016.

2015

William (B. J.) Marshall, Brian J. Ade, Stephen M. Bowman, Ian C. Gauld, Germina Ilas, Ugur Mertyurek, and Georgeta Radulescu, [*Technical Basis for Peak Reactivity Burnup Credit for BWR Spent Nuclear Fuel in Storage and Transportation Systems*](#), NUREG/CR-7194 (ORNL/TM-2015/240), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, April 2015.

D. E. Mueller, W. J. Marshall, D. G. Bowen and J. C. Wagner, [*Bias Estimates Used in Lieu of Validation of Fission Products and Minor Actinides in MCNP Keff 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, September 2015.

Jy-An Wang and Hong Wang, [*Mechanical Fatigue Testing of High-Burnup Fuel for Transportation Applications*](#), NUREG/CR-7198 (ORNL/TM-2014/214), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, May 2015.

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, 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, February 2013.

H. J. Smith, I. C. Gauld, and U. Mertyurek, [*Analysis of Experimental Data for High Burnup BWR Spent Fuel Isotopic Validation – SVEA-96 and GE14 Assembly Designs*](#), NUREG/CR-7162 (ORNL/TM-2013/18), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, March 2013.

2012

G. Radulescu, I. C. Gauld, G. Ilas, and J. C. Wagner, [*An Approach for Validating Actinide and Fission Product Burnup Credit Criticality Safety Analyses—Isotopic Composition Predictions*](#), NUREG/CR-7108 (ORNL/TM-2011/509), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, April 2012.

J. M. Scaglione, D. E. Mueller, J. C. Wagner, and W. J. Marshall, [*An Approach for Validating*](#)

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[Actinide and Fission Product Burnup Credit Criticality Safety Analyses—Criticality \(keff\) Predictions](#), NUREG/CR-7109 (ORNL/TM-2011/514), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, April 2012.

2011

I. G. Gauld, G. Ilas, and G. Radulescu, [Uncertainties in Predicted Isotopic Compositions for High Burnup PWR Spent Nuclear Fuel](#), NUREG/CR-7012 (ORNL/TM-2010/41), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, January 2011.

G. Ilas and I. C. Gauld, [Analysis of Experimental Data for High Burnup PWR Spent Fuel Isotopic Validation—Vandellós II Reactor](#), NUREG/CR-7013 (ORNL/TM-2009/321), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, January 2011.

2010

I. C. Gauld and B. D. Murphy, [Technical Basis for a Proposed Expansion of Regulatory Guide 3.54 — Decay Heat Generation in an Independent Spent Fuel Storage Installation](#), NUREG/CR-6999 (ORNL/TM-2007/231), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, February 2010.

G. Ilas, I. C. Gauld, F. C. Difilippo, and M. B. Emmett, [Analysis of Experimental Data for High Burnup PWR Spent Fuel Isotopic Validation—Calvert Cliffs, Takahama, and Three Mile Island Reactors](#), NUREG/CR-6968 (ORNL/TM-2008/071), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., February 2010.

G. Ilas, I. C. Gauld, and B. D. Murphy, [Analysis of Experimental Data for High Burnup PWR Spent Fuel Isotopic Validation—ARIANE and REBUS Programs \(UO₂ Fuel\)](#), NUREG/CR-6969 (ORNL/TM-2008/072), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., February 2010.

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.

D. E. Mueller, B. T. Rearden, and D. A. Reed, "[Evaluation of Fission Product Critical Experiments and Associated Biases for Burnup Credit Validation](#)," *Proc. 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.

C. V. Parks, J. C. Wagner, D. Mueller, and I. C. Gauld, "[Development of Technical Basis for Burnup Credit Regulatory Guidance in the United States](#)," presented at PATRAM 2010, London, UK, October 3-8, 2010.

G. Radulescu, [Propagation of Isotopic Bias and Uncertainty to Criticality Safety Analyses of PWR Waste Packages](#), ORNL/TM-2010/116, Oak Ridge National Laboratory, Oak Ridge, Tenn., June 2010.

G. Radulescu, I. C. Gauld, and G. Ilas, [SCALE 5.1 Predictions of PWR Spent Nuclear Fuel Isotopic Compositions](#), ORNL/TM-2010/44, Oak Ridge National Laboratory, Oak Ridge, Tenn.,

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March 2010.

J. M. Scaglione and J. C. Wagner, "[Burnup Credit Approach for the Proposed United States Repository at Yucca Mountain](#)," *Proc. 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.

J. C. Wagner, C. V. Parks, D. E. Mueller, and I. Gauld, "[Review of Technical Studies in the United States in Support of Burnup Credit Regulatory Guidance](#)," *Proc. 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.

2009

B. B. Bevard, J. C. Wagner, C. V. Parks, and M. Aissa, "[Review of Information for Spent Nuclear Fuel Burnup Confirmation](#)," NUREG/CR-6998 (ORNL/TM-2007/229), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., December 2009.

I. C. Gauld and Y. Rugama, "Activities of the OECD/NEA Expert Group on Assay Data for Spent Nuclear Fuel," presented at the IAEA International Workshop on Advances in Applications of Burnup Credit for Spent Fuel Storage, Transport, Reprocessing, and Disposition, Córdoba, Spain, October 27-30, 2009.

I. C. Gauld and Y. Rugama, "[Experimental Isotopic Data Compiled by the OECD/NEA EGADSNEF](#)," *Trans. Am. Nucl. Soc.* **101**, 773-775 (2009).

I. C. Gauld, G. Radulescu, and G. Ilas, "SCALE Validation Experience Using an Expanded Isotopic Assay Database for Spent Nuclear Fuel," presented at the IAEA International Workshop on Advances in Applications of Burnup Credit for Spent Fuel Storage, Transport, Reprocessing, and Disposition, Córdoba, Spain, October 27-30, 2009.

G. Ilas and I. C. Gauld, "[SCALE 6 Analysis of Isotopic Assay Benchmarks for PWR Spent Fuel](#)," *Trans. Am. Nucl. Soc.* **101**, 691-693 (2009).

G. Radulescu and I. C. Gauld, "Enhancements to the Burnup Credit Criticality Safety Analysis Sequence in SCALE," IAEA International Workshop on Advances in Applications of Burnup Credit for Spent Fuel Storage, Transport, Reprocessing, and Disposition, Córdoba, Spain, October 27-30, 2009.

G. Radulescu, D. E. Mueller, and J. C. Wagner, "[Sensitivity and Uncertainty Analysis of Commercial Reactor Criticals for Burnup Credit](#)," *Nucl. Technol.* **167(2)**, 268-287, August 2009.

G. Radulescu and I. C. Gauld, "STARBUCS: A SCALE Control Module for Automated Criticality Safety Analyses Using Burnup Credit," ORNL/TM-2005/39, Version 6, Vol. I, Sect. C10, UT-Battelle, LLC, Oak Ridge National Laboratory, Oak Ridge, Tenn., January 2009.

G. Radulescu and I. C. Gauld, "[Enhancements to the Burnup Credit Criticality Safety Analysis](#)

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G. Radulescu, I. C. Gauld, and G. Ilas, "[Evaluation of PWR Isotopic Composition Data](#)," *Trans. Am. Nucl. Soc.* **101**, 688-690 (2009).

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Y. Rugama, I. Gauld, and K. Suyama, "OECD/NEA Expert Group on Assay Data Of Spent Nuclear Fuel," *Proc. ICAPP 2009*, Paper 9057, Tokyo, Japan, May 11–14, 2009.

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"[Burnup Credit for LWR Fuel](#)," ANSI/ANS-8.27-2008, an American National Standard, published by the American Nuclear Society, LaGrange Park, IL, 2008.

M. D. DeHart, I. C. Gauld, and K. Suyama, "Issues in Three-Dimensional Depletion Analysis of Measured Data Near the End of a Fuel Rod," *Trans. Am. Nucl. Soc.* **99**, 663-666 (2008).

M. D. DeHart, I. C. Gauld, and K. Suyama, "Three-Dimensional Depletion Analysis of the Axial End of a Takahama Fuel Rod," International Conference on Reactor Physics, Nuclear Power: A Sustainable Resource, Interlaken, Switzerland, September 14–19, 2008.

G. Ilas and I. C. Gauld, "Analysis of Isotopic Assay Data from the MALIBU Program," presented at the International Conference on Reactor Physics, Nuclear Power: A Sustainable Resource, Interlaken, Switzerland, September 14–19, 2008.

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D. E. Mueller, K. R. Elam, and P. B. Fox, [Evaluation of the French Haut Taux de Combustion \(HTC\) Critical Experiment Data](#), NUREG/CR-6979 (ORNL/TM-2007/83), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., September 2008.

G. Radulescu, D. E. Mueller, and J.C. Wagner, [Sensitivity and Uncertainty Analysis of Commercial Reactor Criticals for Burnup Credit](#), NUREG/CR-6951 (ORNL/TM-2006/87), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., January 2008.

J. A. Roberts and D. E. Mueller, "[Designing Critical Experiments in Support of Full Burnup Credit](#)," *Trans. Am. Nucl. Soc.* **99**, 391-393 (2008).

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- J. C. Wagner, [Criticality Analysis of Assembly Misload in a PWR Burnup Credit Cask](#), NUREG/CR-6955 (ORNL/TM-2004/52), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., January 2008.
- A. H. Wells, [Feasibility of Direct Disposal of Dual-Purpose Canisters, Options for Assuring Critical Control](#), 1016629, Final Report, Electric Power Research Institute, Palo Alto, CA, December 2008.

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["Advances in Applications of Burnup Credit to Enhance Spent Fuel Transportation, Storage, Reprocessing and Disposition"](#), *Proc. Technical Meeting Held in London*, August 29-September 2, 2005, IAEA-TECDOC-1547, International Atomic Energy Agency (May 2007).

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).

L. C. Leal, H. Derrien, M. E. Dunn, and D. E. Mueller, [Assessment of Fission Product Cross-Section Data for Burnup Credit Applications](#), ORNL/TM-2005/65, Oak Ridge National Laboratory, Oak Ridge, Tenn., December 2007.

D. E. Mueller and J. C. Wagner, "[Application of Sensitivity/Uncertainty Methods to Burnup Credit Criticality Validation](#)," *Proc. IAEA Technical Meeting on Advances in Applications of Burnup Credit to Enhance Spent Fuel Transportation, Storage, Reprocessing and Disposition*, August 29-September 2, 2005, London, U.K., IAEA-TECDOC-1547, ISBN 92-0-103307-9, Date of Issue: June 21, 2007.

C. V. Parks, J. C. Wagner, D. E. Mueller, and I. C. Gauld, "[Full Burnup Credit in Transport and Storage Casks--Benefits and Implementation](#)," *Radwaste Solutions* **14(2)**, 32-41 (March/April 2007).

G. Radulescu, D. E. Mueller, S. Goluoglu, D. F. Hollenbach, and P. B. Fox, [Range of Applicability and Bias Determination for Postclosure Criticality of Commercial Spent Nuclear Fuel](#), ORNL/TM-2007/127, Oak Ridge National Laboratory, Oak Ridge, Tenn., October 2007.

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

J. C. Wagner, [Technical Work Plan for Development of Technical Data Needed to Justify Full Burnup Credit in Criticality Safety Licensing Analyses Involving Commercial Spent Nuclear Fuel](#), DOC.20070213.0002, TWP-EBS-MD-000019, Rev. 01, prepared for the U.S. Department of Energy Office of Civilian Radioactive Waste Management by Sandia National Laboratories, Las Vegas, NV, February 2007.

J. C. Wagner and D. E. Mueller, "[Assessment of Benefits for Extending Burnup Credit in](#)

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[Transporting PWR Spent Nuclear Fuel in the USA](#)," *Proc. IAEA Technical Meeting on Advances in Applications of Burnup Credit to Enhance Spent Fuel Transportation, Storage, Reprocessing and Disposition*, August 29-September 2, 2005, London, U.K., IAEA-TECDOC-1547, ISBN 92-0-103307-9, Date of Issue: June 21, 2007.

2006

I. C. Gauld and J. C. Wagner, "Status of Burnup Credit in the United States," presented at the Workshop on the Need for Post Irradiation Experiments to Validate Fuel Depletion Calculation Methodologies, OECD Nuclear Energy Agency, WPNCs, Prague, Czech Republic, December 2006.

I. C. Gauld, "Spent Fuel Isotopic Validation Activities in the United States: Status and Lessons Learned," Workshop on the Need for Post Irradiation Experiments to Validate Fuel Depletion Calculation Methodologies, OECD Nuclear Energy Agency, WPNCs, Prague, Czech Republic, December 2006.

C. V. Parks, J. C. Wagner, and D. E. Mueller, "[Full Burnup Credit in Transport and Storage Casks: Benefits and Implementation](#)," *Proc. International High-Level Radioactive Waste Management Conference*, pp. 1299-1308, Las Vegas, NV, April 30-May 4, 2006.

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S. N. Williams and D. E. Mueller, "[Survey of Operating Parameters for Use in Burnup Credit Calculations](#)," *Trans. Am. Nucl. Soc.* **95**, 269-273 (2006).

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).

2005

M. D. DeHart and S. M. Bowman, "[Improved Radiochemical Assay Analyses Using TRITON Depletion Sequences in SCALE](#)," presented at the IAEA Technical Meeting on Advances in Applications of Burnup Credit to Enhance Spent Fuel Transportation, Storage, Reprocessing and Disposition, London, U.K., August 29-September 2, 2005.

I. C. Gauld and D. E. Mueller, "[Evaluation of Cross-Section Sensitivities in Computing Burnup Credit Fission Product Concentrations](#)," ORNL/TM-2005/48, Oak Ridge National Laboratory, Oak Ridge, Tenn., August 2005.

D. E. Mueller and G. A. Harms, "[Using the SCALE 5 TSUNAMI-3D Sequence in Critical Experiment Design](#)," *Trans. Am. Nucl. Soc.* **93**, 263-266 (2005).

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D. E. Mueller and J. C. Wagner, "[Application of Sensitivity/Uncertainty Methods to Burnup Credit Criticality Validation](#)," presented at the IAEA Technical Meeting on Advances in Applications of Burnup Credit to Enhance Spent Fuel Transportation, Storage, Reprocessing and Disposition, London, U.K., August 29-September 2, 2005.

C. V. Parks and J. C. Wagner, "[A Coordinated U.S. Program to Address Full Burnup Credit in Transport and Storage Casks](#)," presented at the IAEA Technical Meeting on Advances in Applications of Burnup Credit to Enhance Spent Fuel Transportation, Storage, Reprocessing and Disposition, London, U.K., August 29-September 2, 2005.

C. V. Parks, C. J. Withee, and J. C. Wagner, "[U.S. Regulatory Recommendations for Actinide-Only Burnup Credit in Transport and Storage Casks](#)," presented at the IAEA Technical Meeting on Advances in Applications of Burnup Credit to Enhance Spent Fuel Transportation, Storage, Reprocessing and Disposition, London, U.K., August 29-September 2, 2005.

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J. C. Wagner and D. E. Mueller, "[Updated Evaluation of Burnup Credit for Accommodating PWR Spent Nuclear Fuel in High-Capacity Cask Designs](#)," presented at the 2005 NCS D Topical Meeting, Knoxville, TN, September 19-22, 2005.

J. C. Wagner, C. V. Parks, and D. E. Mueller, "[Assessment of Benefits for Extending Burnup Credit in Transporting PWR Spent Nuclear Fuel in the USA](#)," presented at the IAEA Technical Meeting on Advances in Applications of Burnup Credit to Enhance Spent Fuel Transportation, Storage, Reprocessing and Disposition, London, U.K., August 29-September 2, 2005.

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G. A. Harms, P. H. Helmick, J. T. Ford, S. A. Walker, D. T. Berry, and P. S. Pickard, *Experimental Investigation of Burnup Credit for Safe Transport, Storage, and Disposal of Spent Nuclear Fuel, Final Report, Nuclear Energy Research Initiative Project 99-0200*, Sandia Report SAND2004-0912, Sandia National Laboratories, April 2004.

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