

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 wagnerjc@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

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., 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.

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B. B. Bevard, J. C. Wagner, C. V. Parks, and M. Aissa, [Review of Information for Spent Nuclear Fuel Burnup Confirmation](#), NUREG/CR-6998, 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 EGADSNF](#)," *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 Sequence in SCALE](#)," *Proc. 2009 Nuclear Criticality Safety Division Topical Meeting on Realism, Robustness and the Nuclear Renaissance*, Richland, WA, September 13-17, 2009, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2009).

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

Y. Rugama, R. Blomquist, M. Brady-Raap, B. Briggs, V. Rouyer, Y. Miyoshi, I. Gauld, and T. Ivanova, "Fuel Cycle Associated Activities of the OECD/NEA/NSC Working Party on Nuclear Criticality Safety," presented at GLOBAL 2009, 'The Nuclear Fuel Cycle: Sustainable Options & Industrial Perspectives,' Paris, France, September 6-11, 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.

D. E. Mueller, "[Evaluation of the HTC Critical Experiment Data for Spent Nuclear Fuel](#)," *Trans. Am. Nucl. Soc.* **98**, 219-222 (2008).

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

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).

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.

G. Radulescu, D. E. Mueller, and J. C. Wagner, "[Evaluation of Applicability of CRC Models for Burnup Credit Validation](#)," *Trans. Am. Nucl. Soc.* **97**, 151-153 (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).

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 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.

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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.

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).

M. T. Wenner, J. C. Wagner, and L. M. Petrie, "[A New Source Initialization Capability for the SCALE Burnup Credit Sequence](#)," *Trans. Am. Nucl. Soc.* **95**, 310-311 (2006).

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 B. T. Rearden, "[Sensitivity Coefficient Generation for a Burnup Credit Cask Model using TSUNAMI-3D](#)," presented at the 2005 NCSD Topical Meeting, Knoxville, TN, September 19-22, 2005.

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.

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).

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).

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).

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 NCSD 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.

A. Zimmer, J. Razvi, L. Johnson, B. Welch, and D. Lancaster, "Expansion of the Capabilities of the GA-4 Legal Weight Truck Spent Fuel Shipping Cask," *RAMTRANS* **16(3)**, 205-209 (2005).

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2004

BSC (Bechtel SAIC Company) 2004a. *BWR Axial Profile*. CAL-DSU-NU-000005 REV 00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: DOC.20040927.0039.

BSC (Bechtel SAIC Company) 2004b. *21-PWR Waste Package with Absorber Plates Loading Curve Evaluation*. Las Vegas, Nevada: Bechtel SAIC Company. ACC: DOC.20040922.0004.

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.

H. L. Massie, Jr. 2004. *Reactor Record Uncertainty Determination*. 32-5041666-02. Las Vegas, Nevada: Areva. ACC: DOC.20040623.0002.

C. V. Parks and J. C. Wagner, "[Current Status and Potential Benefits of Burnup Credit for Spent Fuel Transportation](#)," *Proc. American Nuclear Society, 14th Pacific Basin Conf.*, Honolulu, Hawaii, March 21-25, 2004.

C. V. Parks and J. C. Wagner, "Status of Burnup Credit for Transport of SNF in the United States," *14th International Symposium on the Packaging and Transportation of Radioactive Materials*, Berlin, Germany, September 20-24, 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. 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).

A. H. Wells, 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).

2003

BSC (Bechtel SAIC Company) 2003a. [PWR Axial Burnup Profile Analysis](#). CAL-DSU-NU-000012 REV 00A. Las Vegas, Nevada: Bechtel SAIC Company. ACC: DOC.20031002.002.

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I. C. Gauld, [*Strategies for Application of Isotopic Uncertainties in Burnup Credit*](#), NUREG/CR-6811 (ORNL/TM-2001/257), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., June 2003.

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).

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C. E. Sanders and I. C. Gauld, [*Isotopic Analysis of High-Burnup PWR Spent Fuel Samples From the Takahama-3 Reactor*](#), NUREG/CR-6798 (ORNL/TM-2001/259), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., January 2003.

C. E. Sanders and J. C. Wagner, [*Study of the Effect of Integral Burnable Absorbers on PWR Burnup Credit*](#), NUREG/CR-6760 (ORNL/TM-2000/321), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., March 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. *Preclosure Criticality Analysis Process Report*. TDR-EBS-NU-000004 REV 01. Las Vegas, Nevada: Office of Civilian Radioactive Waste Management (2003).

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J. C. Wagner and C. V. Parks, [*Recommendations on the Credit for Cooling Time in PWR Burnup Credit Analyses*](#), NUREG/CR-6781 (ORNL/TM-2001/272), prepared for the U.S. Nuclear Regulatory Commission by Oak Ridge National Laboratory, Oak Ridge, Tenn., January 2003.

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A. S. Chesterman, "[Spent Fuel Measurements to Improve Storage and Transport Efficiency](#)," in *Proc. KAIF Meeting, Spent Fuel Management*, 2002, South Korea.

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Japan Atomic Energy Research Institute (JAERI), *Technical Development on Burn-up Credit for Spent LWR Fuel*, (Eds.) Y. Nakahara, K. Suyama, and T. Suzaki, JAERI-Tech 2000-071, Tokai-mura, Naka-gun, Ibaraki-ken, Japan, October 2000. [ORNL/TR-2001/01 English Translation, Oak Ridge National Laboratory, January 2002]

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