

Bret Patrick van den Akker, PhD

Education

University of California, Berkeley

12/2012

Ph.D. in Nuclear Engineering. Emphasis in Applied Mathematics.

Work Experience

Research Associate, Oak Ridge National Laboratory

07/2014 - present

- Used Nuclear Fuel Systems Group:
 - Agent based model development of US and International Fuel Cycles for Plutonium tracking and non-proliferation.
 - Developed method for the automated generation of nuclear inventory reports using Java, LaTeX, and SQL.
 - Developed cost estimate models and identified challenges for the repackaging of spent-fuel and disposal of dry casks.
 - Support development of the next generation logistical tool for the management of US commercial spent nuclear fuel.
 - Major update of the Characteristics of Radioactive Waste Database (last updated 1992) – catalog of US nuclear waste.

Post-Doctoral Research Associate, Oak Ridge National Laboratory

07/2013 – 07/2014

- National Nuclear Technical Forensics Group:
 - Classified research on the forensic use of noble gases during investigation of terrorist urban nuclear detonations.

Post-Doctoral Research Associate, University of California, Berkeley

12/2012 - 07/2013

- Published two first authored peer reviewed journal articles and three conference papers related to doctoral research.
- Collaborated on research and journal articles, mentored undergrads, and trained postdocs and graduate students on software.

Doctoral Student Researcher, University of California, Berkeley

01/2007 - 12/2012

- **Doctoral Research:** Safety Assessment of the Geological Disposal of Deep-Burn Spent Fuel.
 - Developed advanced mathematical models to quantify radionuclide transport from disposal site into the biosphere.
 - Analyzed the efficacy of the Deep-Burn nuclear fuel cycle in transmuting its fuel for the purposes of electricity generation, reducing the environmental impact of the subsequent spent fuel form, and reducing nuclear-proliferation risks.
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Leadership

Project Manager, Oak Ridge National Laboratory

FY 2016

- Redesign of Wet and Dry Repackaging Facilities for Spent Nuclear Fuel Canisters
 - Wet facility costs reduced by \$2B (2.5x reduction) while maintaining facility throughput and adding design modularity.
 - Managing subject matter experts and independent contractors on design and costing efforts.

Work Package Manager, Oak Ridge National Laboratory

FY 2015

- Waste Management System Analysis Tool Development and Maintenance Work Package
 - Managed subject matter experts on development of analytical tools to enhance waste management system analysis.
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Selected Publications

B. P. van den Akker, E. Orcoglu, and J. Ahn, Effects of Depth on Transport of ^{129}I in Crystalline Rock, *Annals of Nuclear Energy*, November 2015.

B. P. van den Akker and J. Ahn, 1-D Modeling of Radionuclide Transport via Heterogeneous Geological Formations for Arbitrary Length Decay Chains Using Numerical Inversion of Laplace Transforms, *Annals of Nuclear Energy*, March 2014.

B. P. van den Akker and J. Ahn, Performance Assessment for Geological Disposal of Graphite Waste Containing TRISO Particles, *Nuclear Technology*, March 2013.

B. P. van den Akker, On the Disposition of Graphite Containing TRISO Particles and the Aqueous Transport of Radionuclides via Heterogeneous Geological Formations, Ph.D. Dissertation, University of California, Berkeley, December 2012.

B. P. van den Akker and J. Ahn, Performance Assessment for the Geological Disposal of Deep Burn Spent Fuel Using TTBX, GLOBAL 2013: International Fuel Cycle Conference, September 29 – October 3, 2013, Salt Lake City, Utah, American Nuclear Society 2013.

B. P. van den Akker and J. Ahn, Model Development for Transport of Radionuclides via Heterogeneous Geological Media, International High-Level Radioactive Waste Management Conference (IHLRWM), April 28-May 2, 2013, Albuquerque, New Mexico, American Nuclear Society, 2013.

B. P. van den Akker and J. Ahn, Performance Assessment for Geological Disposal of Graphite Waste Containing TRISO Particles, *Nuclear Technology*, March 2013.

B. P. van den Akker and J. Ahn, Deep-Burn Spent Fuel: Graphite as a Possible High Level Waste Matrix, Proceeding of GLOBAL 2011, December 11-16, 2011, Makuhari Messe, Chiba, Japan, 2011.

B. P. van den Akker and J. Ahn, The Release and Transport of Radionuclides from Deep- Burn Spent Fuel, 13th International High-Level Radioactive Waste Management Conference (IHLRWM), April 10-14, 2011, Albuquerque, New Mexico, American Nuclear Society, 2011.

B. P. van den Akker and J. Ahn, Solubilities of Radionuclides Released from Graphite Waste Calculated Using PHREEQC, 13th International High-Level Radioactive Waste Management Conference (IHLRWM), April 10-14, 2011, Albuquerque, New Mexico, American Nuclear Society, 2011.