

# ► Cole Gentry

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## Education

### PhD Candidate, Nuclear Engineering, University of Tennessee (05/2015)

- GPA 4.0
- Thesis Topic: "Development of a Reactor Physics Analysis Procedure for the Plank-Based and Liquid Salt-Cooled Advanced High Temperature Reactor"

### Master's Degree in Nuclear Engineering, University of Tennessee (05/2012)

- GPA 4.0
- Thesis Topic: "An Investigation of the use of Ceramic Microencapsulated Fuel for Transuranic Waste Recycling in Pressurized Water Reactors"

### Bachelor's Degree in Nuclear Engineering, University of Tennessee (05/2008)

- Summa Cum Laude
- GPA 4.0
- Outstanding Undergraduate Awards 2003 - 2004, 2004 - 2005, 2005 - 2006
- Top Collegiate Scholar Award 2008

## Publications

C.Gentry, G.I.Maldonado, A. Godfrey, K.Terrani, J.Gehin, J.Powers, "A Neutronic Investigation of the Use of Fully Ceramic Microencapsulated Fuel for Pu/Np Burning in PWRs", *Nuclear Technology*, **186**, pg 60-75, April 2014

C.Gentry, N.George, O.Chvala, G.I.Maldonado, S.Lewis, P.Avigni, B. Petrovic, "Core Physics Parametric Studies for Liquid Salt Cooled Reactors", *ANS Transactions*, **108**, pg 831-833, June 2013

C.Gentry, "An Investigation of the use of Ceramic Microencapsulated Fuel for Transuranic Waste Recycling in Pressurized Water Reactors", Master's Thesis, University of Tennessee Knoxville, May 2012

C.Gentry, N.George, I.Maldonado, A.Godfrey, K.Terrani, J.Gehin,, "Application of Fully Ceramic Micro-Encapsulated Fuels in Light Water Reactors", *Proceedings of ICAPP*, Paper 12359, 2012

C.Gentry, I. Maldonado, A.Godfrey, K.Terrani, J.Gehin, "Application of Fully Ceramic Micro-Encapsulated Fuel for Transuranic Waste Recycling in PWRs", *PHYSOR*. 2012

## Awards

Innovations in Fuel Cycle Research award recipient in the Competition for Students Who Attend Universities with Less than \$630 Million in 2009 R&D Expenditures for the PHYSOR paper "Application of Fully Ceramic Micro-Encapsulated Fuel for Transuranic Waste Recycling in PWRs"

## Experience

Graduate Research Assistant (08/2010 – present)

University of Tennessee Knoxville / Oak Ridge National Lab (Knoxville / Oak Ridge, TN)

Performed benchmarking model improvements of Peach Bottom reactor created by previous PhD graduate. Learned the ORNL neutronic simulation SCALE package (through both use and formal training) and the 3D nodal simulator NESTLE.

Researched PWR fuel designs in support of the "Deep-Burn" project for transuranic waste recycling. Simulations performed using SCALE NEWT and NESTLE. Research successfully defended as a Master's Thesis.

Worked under the CASL project as part of the AMA group. Helped with coding a SCALE KENO input generator and output post processor for large PWR core models for benchmarking against the VERA core simulator. Developed and presented training material on the VERA module Cobra-TF for the CASL student workshop.

Currently working on a collaborative project with Georgia Institute of Technology on "Fuel and Core Design Options to Overcome the Heavy Metal Loading Limit and Improve Performance and Safety of Liquid Salt Cooled Reactors". Learned to use the SERPENT and SERPENT 2 BETA Monte Carlo codes to support this project. Implemented direct parallelepiped geometry modeling in SERPENT 2 for both neutronics models of fuel form and random particle dispersion within fuel form. Implemented improved random dispersion algorithm to allow for packing fractions near the theoretical limit for random closed packing. Developed input generator for SERPENT 2 LSCR models. Assessed modeling simplifications for runtime improvement and model accuracy. Performed 2-D lattice model parametric study for various design considerations. Performed scaling study of SERPENT 2 on the Cray XT5 Kraken supercomputer.

#### Reactor Engineer (05/2008 – 07/2010) Tennessee Valley Authority (Soddy-Daisy, TN)

Performed routine and periodic Pressurized Water Reactor (PWR) reactor engineering activities including flux mapping, reactivity monitoring, estimating reactor criticality conditions, low power physics testing, incore to excore detector cross calibrations, and developing power maneuvering plans. Supported fuel movement, fuel inspections, reactor vessel inspections, and other re-fueling outage activities.

Lead investigator for an apparent cause analysis. Taught operator training class on the topic of Anticipated Temporary Radial Power Tilts During Power Ascension. Developed lecture material for and taught an engineering class on Critical Thinking and Documentation. Provided support for the 4-Face Fuel Inspection System upgrade project, including planning, scheduling, and job oversight of outage laser measurement scanning as well as measurement extraction using CSA PanoMap software.

Developed, maintained, and improved procedures, actively participated in corrective action program implementation, supported work management activities and plant improvement projects.

Completed the Westinghouse Station Nuclear Engineering Course

#### Reactor Engineering/ Balance of Plant / Nuclear Fuels Design Intern (05/2004 – 08/2007) Tennessee Valley Authority (Soddy-Daisy & Chattanooga, TN)

Wrote FORTRAN based format converter. Performed extensive video inspection of PWR top nozzle bulge joints. Investigated preliminary BWR Fuel Designs using Alladin Software package. Performed feasibility study of extended BWR cycle length. Used ROSA core design software to help in producing a preliminary design for a PWR core. Helped in verifying BWR core design acceptability. Produced preliminary fuel shuffle plans using Shuffleworks software.

Performed system walk-downs and subsequent data entry. Participated in extensive Balance of Plant system component ID tag number verifications. Participated in routine reactor engineering activities including flux mapping, incore to excore cross calibrations, and power maneuvering.

#### **Skills**

- ▶ C/C++, FORTRAN, JAVA, Python, MATLAB, SCALE, SERPENT, MCNP, VERA, PARCS, NESTLE, Microsoft Office, Technical Writing, Procedure Writing, ROSA, AREVA Powertrax, Westinghouse Shuffleworks, Organizational and Time Management, Project / Work Process Management, HTML, CSS, Adobe Photoshop, Adobe After Effects, Japanese (Intermediate)

#### **Interests**

- ▶ Soccer, Ultra Marathon Running, Flute, Saxophone, Painting, Adobe Photoshop, Brazilian Jiu Jitsu