

## SUMMARY

Nuclear Engineer (MS) with approximately 15 years' experience in Nuclear Criticality Safety (NCS).

## EDUCATION

*University of New Mexico*

**Doctoral Candidate** (Expected graduation date Summer 2014)

University of New Mexico

**Master of Science in Nuclear Engineering**, 1997

Thesis: "The coupling of ORIGEN and MCNP for reactor core and spent fuel criticality analyses"

University of New Mexico

**Bachelor of Science in Nuclear Engineering**, 1995

## WORK EXPERIENCE

2012–

*Present*

**Senior R&D Staff**

**Nuclear Data and Criticality Safety Group; Reactor and Nuclear Systems Division, Oak Ridge National Laboratory, Oak Ridge, TN**

Providing general nuclear engineering support and nuclear criticality safety support to the NRC, DOE, ORNL, and other organizations.

Support includes:

- Providing support to NRC for a robust technical basis for the exemption and general license for transporting fissile material packages in addition to examples of using the criteria in 10CFR71.
- Providing support to ORNL with respect to developing a technical justification for a low power critical facility at the High Flux Isotope Reactor at ORNL.
- Assisting with the development of a training course for analysts and generalists involved with the review and development of Safety Analysis Reports for Packaging documentation.
- Providing NCS support the Nuclear Criticality Safety Program for the DOE Training and Education Project Nuclear Criticality Safety courses.

2010–

2012

**Nuclear Criticality Safety Group Leader**

**NCS Group, Safety Basis Division, Los Alamos National Laboratory (LANL), Los Alamos, NM**

- Managed 13 technical staff and contractors with an annual budget of approximately \$6.0M.
- Responsible for maintaining the LANL NCS program on a daily basis consisting of 9 nuclear facilities in Los Alamos, NM and the National Criticality Experiments Research Center (NCERC) at the Nevada Test Site.
- Managed the LANL Program Improvement Plan in order to achieve compliance with DOE Orders and National Consensus Standards related to Nuclear Criticality Safety.
- Worked closely with other Safety Basis group leaders and Facility Operations Directors on NCS program issues for all nine LANL nuclear facilities, e.g., NCS program implementation, new fissile operations, DSA updates, infractions, etc.
- Served as the lead developer and as the point-of-contact for the NCSP Training and Education Project LANL classroom training.
- Prepared and presented NCS training for a variety of government agencies and LANL organizations as necessary.
- Served on the Chemistry and Metallurgy Research Facility Replacement (CMRR) project as the lead NCS advisor for the project design team (2001-2012).
- Participated in facility assessments, audits, and implementation verification reviews at LANL as necessary as a member of the LANL Nuclear Criticality Safety Committee.

- Developed and reviewed NCS evaluations for all nine LANL nuclear facilities and the NCERC.

2008–

2010

**Nuclear Criticality Safety Deputy Group Leader**

**Nuclear Criticality Safety Group, Safety Basis Division, Los Alamos National Laboratory (LANL), Los Alamos, NM**

- Responsible for directing the work and managing technical evaluation issues for the NCS technical staff.
- Manage nuclear facility work priorities, budgets and schedules.
- Work closely with safety basis and facility operations personnel to implement NCS controls into Documented Safety Analyses (DSAs).
- Participate in facility readiness reviews and audits as necessary.
- Work daily with NNSA regulators and DNFSB site representatives on program compliance issues.
- Work with program managers and designers to incorporate NCS engineered controls into a nuclear facility designs and preliminary DSAs.
- Performed and reviewed process evaluations for all LANL nuclear facilities.
- Assisted in the incorporation of NCS requirements into operating procedures and Nuclear Facility safety basis documentation.
- Prepared and presented NCS training for a variety government agencies and LANL staff
- Developed and reviewed NCS evaluations for all nine LANL nuclear facilities and the NCERC.

2001–

2008

**Sr. Nuclear Criticality Safety Engineer**

**NCS Group, Safety Basis/ESH Division, LANL, Los Alamos, NM**

- Developed and reviewed NCS evaluations for fissile material operations with  $^{239}\text{Pu}$  and  $^{235}\text{U}$ .
- Evaluations developed to support pit production operations and pit disassembly operations for NNSA stockpile surveillance program.
- Provided criticality safety design guidance for the proposed Chemical and Metallurgical Research Replacement (CMRR) facility.
- Support the NCS aspects of the subcritical experiment program at LANL and at the Nevada Test Site (Device Assembly Facility and U1A Facility).
- Taught training modules for the LANL nuclear criticality safety courses.
- Provided developmental and ongoing support for the LANL program improvement plan and assist with DOE/NNSA audits and interactions when necessary.

1998–

2001

**Nuclear Criticality Safety Engineer**

**NCS Group, United States Enrichment Corporation, Paducah, KY**

- Responsible for the development of NCS evaluations for  $\text{UF}_6$  enrichment processes in the gaseous diffusion cascade and implementing NCS controls.
- NCS evaluation work focused on fissile operations with  $\text{UO}_2\text{F}_2$  solutions and  $\text{UF}_4$ -oil mixtures with enrichments up to 5.5 wt. %  $^{235}\text{U}$ .
- Conducted inspections and audits of fissile material operations, procedure reviews, and NCS training sessions.
- Performed shielding calculations with MCNP to verify criticality accident alarm coverage.
- Interacted with NRC staff on assessments when necessary.
- Responsible for the technical oversight of six consultants developing NCS evaluations for plant design changes.

1995–

1998 **Nuclear Engineer**

**Risk Assessment Group, IT Corporation, Albuquerque, NM**

- Developed dose rate models for ecological and human receptors exposed to radionuclides at various DOE and DOD sites.
- Performed dose model verifications using MCNP.
- Performed criticality and shielding analyses for various shipping containers used for WIPP shipments.

### **PROFESSIONAL AFFILIATIONS**

- American Nuclear Society (ANS), member
- Past ANS Nuclear Criticality Safety Division Chairman
- Working group co-chair of ANSI/ANS-8.1 standard for fissionable material operations outside of reactors

### **PUBLICATIONS**

Bowen, D. G., “The Role of Criticality Safety Officers at Los Alamos National Laboratory,” Los Alamos National Laboratory, LA-UR-09-0606 (2009).

Bowen, D. G., “Integration of NCS in the Chemistry and Metallurgy Research Replacement Facility at Los Alamos National Laboratory,” Los Alamos National Laboratory, LA-UR-09-0607 (2009).

Bowen, D. G. and N. W. Brown, “ANSI/ANS-8.1 Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors,” Los Alamos National Laboratory, LA-UR-08-7219 (2008).

Bowen, D. G. and R. D. Busch, “Hand Calculation Methods for Criticality Safety – A Primer,” LA-14244-M, Los Alamos National Laboratory (2006).

Bowen, D. G., “ENDF/B Cross-Section Evolution for Criticality Safety Burnup Credit Applications,” Transactions of the American Nuclear Society, 93, 267 (2005).

Bowen, D. G. and R. D. Busch, “Hand Calculational Methods for Criticality Safety – A Primer,” 2005 Nuclear Criticality Safety Division Topical Meeting, Knoxville, TN (2005).

Bowen, D. G., “Preliminary Subcritical Mass and Volume Calculations for Various Plutonium Compounds to Support a Revision to ANSI/ANS-8.1,” Los Alamos National Laboratory, LA-UR-04-7989 (2004).

Bowen, D. G. and R. D. Busch, “Using ORIGEN and MCNP to Calculate Reactor Criticals and Burnup Effects,” Transactions of the American Nuclear Society, 77, 233 (1997).

Bowen, D. G., “The Coupling of ORIGEN and MCNP for Reactor Core and Spent Fuel Criticality Analyses,” Master’s Thesis, University of New Mexico (1997).

### **AWARDS**

Yucca Mountain Project Achievement Award (2003)

Defense Programs Award of Excellence (2005-2006)

Los Alamos Award of Excellence (2007)

Los Alamos Achievement Award (2004-2008)

Los Alamos National Laboratory Distinguished Performance Award (2009, 2010)

### **Security Clearance Level**

Active – DOE “Q” (Secret) clearance

Inactive – Human reliability program