

Karla Riggle Elam, Ph.D.

EXPERIENCE:

Senior Development Staff Member, Nuclear Science and Technology Division
Oak Ridge National Laboratory **11/98 - present**

International Criticality Safety Benchmark Evaluation Project

Evaluate and document critical experiments for inclusion in the International Handbook of Evaluated Criticality Safety Benchmark Experiments. (4/99 - present)

Technical Support to ORNL Nuclear Criticality Safety Group

Prepare Nuclear Criticality Safety Evaluations and Approvals for selected fissile material processes in Building 3019. (10/00 - present)

Technical Assistance to the Nuclear Regulatory Commission

Develop emplacement criticality guidance for low-level radioactive waste disposal. (11/98 - 6/99)

Development Staff Member, Chemical Technology Division
Oak Ridge National Laboratory **1/95 - 11/98**

Criticality Safety Support for the Y-12 Plant Enriched Uranium Operations Restart

Responsible for preparing criticality safety evaluations and developing criticality safety requirements for processes to be restarted within Enriched Uranium Operations, including packaging, sampling, nondestructive analysis, and vacuum systems. Also responsible for reviewing procedures and drawings, performing walkdowns, and observing operations once restarted. (10/96 - 11/98)

Criticality Safety Studies for the K-25 Site Deposit Removal Program

Responsible for preparing criticality safety approvals for equipment that would use chlorine trifluoride to remove solid uranium deposits from gaseous diffusion plant equipment. Performed SCALE/KENO calculations in support of criticality safety evaluations. (4/95 - 6/96)

Fissile Material Disposition Program

Provided design information and chemical data for the programmatic environmental impact statement on using the Glass Material Oxidation and Dissolution System for the processing of surplus fissile materials. (1/95 - 9/96)

Waste Certification Program Coordinator, Martin Marietta Energy Systems **6/92 - 12/94**

Responsible for overseeing and coordinating the development and implementation of a uniform waste certification program at each of the five sites managed for the DOE by MMES. Participated on national working groups concerning waste characterization and certification.

Civilian Radioactive Waste Management Fellow,
Oak Ridge Associated Universities,
funded by the DOE Office of Civilian Radioactive Waste Management **9/87 - 5/92**

EXPERIENCE (cont.):

Fellowship supported the continuation of graduate studies through completion of the
Doctoral degree at the University of Missouri - Columbia.

Included two practicum experiences at Oak Ridge National Laboratory.

1988: Assessment of atmospheric exposure pathway computer codes for OCRWM.

1990: Validation of ORIGEN2 computer code using laboratory analysis.

Graduate Research Assistant, Missouri University Research Reactor (MURR) 8/86 - 9-87

Performed neutron activation analysis of various sample matrices for trace element content.

Research Specialist, Missouri University Research Reactor (MURR) 6/85 - 8/86

Responsible for analysis of liquid effluents, stack air filters, reactor coolants, environmental samples, and various contaminant swipes using gamma-ray spectroscopy and liquid scintillation counting.

Laboratory Assistant, Chemistry and Biology Departments, Southwest Baptist University 9/82 - 5/85

Responsible for supervision of lower division laboratory classes, preparation of necessary materials and grading of reports.

Research Assistant, Chemistry Department, University of Missouri - Columbia 6/83 - 7/83, 6/84 - 7/84

Responsible for preparation of single crystals for X-ray crystallography and other support for principle investigator, including library searches.

EDUCATION:

Doctor of Philosophy in Nuclear Engineering 1992

University of Missouri - Columbia

Dissertation: Environmental Monitoring for Uranium and Neptunium Using Epithermal Neutron Activation Analysis.

Collateral field: Statistics and Regression Analysis

Master of Science in Nuclear Engineering/Health Physics 1988

University of Missouri - Columbia

Thesis: A Preliminary Assessment of Selected Atmospheric Dispersion, Food-Chain Transport, and Dose-to-Man Computer Codes for Use by the DOE Office of Civilian Radioactive Waste Management.

Bachelor of Science in Chemistry 1985

Southwest Baptist University, Bolivar, Missouri

ADDITIONAL QUALIFICATIONS:

Strong oral and written communication skills. Can interact well with both operations and regulatory personnel. Able to rapidly adjust to changing schedules and priorities. Fast learner with an eye for detail.

Current DOE Q Clearance.

Experience with SCALE/KENO computer codes.

PROFESSIONAL SOCIETIES:

American Nuclear Society, including the Oak Ridge/Knoxville Local Section.

PUBLICATIONS:

Elam, K. R., and W. C. Jordan, "Paraffin-Reflected 5-, 5.4-, 6-, 6.6-, 7.5-, 8-, 8.5-, 9-, and 12-inch-diameter Cylinders of ^{233}U Uranyl Fluoride Solutions," U233-SOL-THERM-003, in *International Handbook of Evaluated Criticality Safety Benchmark Experiments*, NEA/NSC/DOC(95)03/V, Nuclear Energy Agency, Organization for Economic Co-operation and Development, Paris, France (September 2000).

Elam, K. R., C. M. Hopper, C. V. Parks, and T. E. Harris, Emplacement Guidance for Criticality Safety in Low-Level Waste Disposal, ORNL/TM-13765, June 2001.

Elam, K. R., C. W. Forsberg, C. M. Hopper, and R. Q. Wright, Isotopic Dilution Requirements for ^{233}U Criticality Safety in Processing and Disposal Facilities, Oak Ridge National Laboratory, ORNL/TM-13524, 1997.

Forsberg, C. W., E. C. Beahm, G. W. Parker, and K. R. Elam, "Conversion of Radioactive and Hazardous Chemical Wastes into Borosilicate Glass Using the Glass Material Oxidation and Dissolution System," Waste Management, 1996, Vol. 16(7), pp. 615-623.

Haire, M. J., K. R. Elam, and W. C. Jordan, Nuclear Criticality Safety Analyses of a Uranium Deposit in the K-29 Building at the Oak Ridge K-25 Site, Oak Ridge, Tennessee, Oak Ridge K-25 Site, K/ER-310, July 1996.

Forsberg, C. W., et. al., Direct Vitrification of Plutonium-Containing Materials (PCMs) with the Glass Material Oxidation and Dissolution System (GMODS), Oak Ridge National Laboratory, ORNL-6825, October 1995.

Elam, K. R., and W. J. Reich, Determination of the Theoretical Feasibility for the Transmutation of Europium Isotopes from High Flux Isotope Reactor Control Cylinders, Oak Ridge National Laboratory, ORNL/ER-340, September 1995.

Forsberg, C. W., K. R. Elam, and W. J. Reich, New Glass Material Oxidation and Dissolution System Facility: Direct Conversion of Surplus Fissile Materials, Spent Nuclear Fuel, and Other Materials to High-Level-Waste Glass, Oak Ridge National Laboratory, ORNL/MD/LTR-13, March 1995.

Forsberg, C. W., K. R. Elam, and W. J. Reich, New Glass Material Oxidation and Dissolution System Facility, Oak Ridge National Laboratory, ORNL/MD/LTR-11, February, 1995.

Forsberg, C. W., and K. R. Elam, Direct Conversion of Surplus Fissile Materials, Spent Nuclear Fuel, and Other Materials to High-Level-Waste Glass, Oak Ridge National Laboratory, ORNL/MD/LTR-8, January 1995.

Riggle, K. J., T. Lynde-Kernell, and E. O. Schlemper, "Synthesis and X-Ray Structures of Ni(II) Complexes of 1-(2-Pyridinyl)Ethanone Oxime," Journal of Coordination Chemistry, 1992, Vol. 25, 117-125.

Riggle, K. J., and J. W. Roddy, A Preliminary Assessment of Selected Atmospheric Dispersion, Food-Chain Transport, and Dose-to-Man Computer Codes for Use by the DOE Office of Civilian Radioactive Waste Management, Oak Ridge National Laboratory, ORNL-TM/10915, February 1989.

CONFERENCE PAPERS:

Rearden, B. T., C. M. Hopper, K. R. Elam, B. L. Broadhead, and P. B. Fox, "Prototypic Applications of Sensitivity and Uncertainty Analysis for Experiment Needs," submitted to the ANS 2000 Winter Meeting, Washington, D.C., November 12-16, 2000.

Hopper, C. M., K. R. Elam, C. V. Parks, and J. J. Lichtenwalter, "Bounding Values for Low-Level Waste Transport Exemptions and Disposal," submitted to the ICNC'99 Sixth International Conference on Nuclear Criticality Safety, Versailles, France, Sept. 20-24, 1999.

Forsberg, C. W., K. R. Elam and C. M. Hopper, "Repository Criticality Control for Uranium-233 Using Depleted Uranium," submitted to the ANS 1999 Winter Meeting, Long Beach, California, Nov. 14-18, 1999.

Hopper, C. M., R. Q. Wright, K. R. Elam, and C. W. Forsberg, "Isotopic Dilution of ^{233}U with Depleted Uranium for Criticality Safety in Processing and Disposal," pp.176-180; Proc. Top. Meet. on Criticality Safety Challenges in the Next Decade, Session: Analysis for Safe Operations, Chelan, WA, American Nuclear Society, La Grange Park, Illinois, Am. Nucl. Soc., Sept.7-11,1997.

Haire, M. J., K. R. Elam, W. C. Jordan, and T. L. Dahl, Sr., "Nuclear Criticality Safety Modeling of an LEU Deposit," presented at the Embedded Topical Meeting, "Worldwide Experience-DD&R, What Does it Mean," American Nuclear Society/European Nuclear Society 1996 International Conference and Embedded Topical Meetings, Washington, D.C., November 1996.

Elam, K. R., M. J. Haire, W. C. Jordan, and T. L. Dahl, Sr., "Criticality Sensitivity Analysis of Uranium Deposits in Large Diameter Piping," pp. 207-208; Trans. Am. Nucl. Soc., Vol. 74, presented at ANS Annual Meeting, Reno, Nevada, June 1996.

Forsberg, C. W., E. C. Beahm, G. W. Parker, and K. R. Elam, "Conversion of Plutonium-Containing Materials into Borosilicate Glass Using the Glass Material Oxidation and Dissolution System," presented at American Institute of Chemical Engineers Spring Annual Meeting, New Orleans, Louisiana, February 1996.

Forsberg, C. W., E. C. Beahm, G. W. Parker, J. Rudolph, K. R. Elam, and J. J. Ferrada, "Conversion of Plutonium Scrap and Residue to Borosilicate Glass Using the GMODS Process," presented at Plutonium Stabilization and Immobilization Workshop, Washington, D.C., December 1995.

Riggle, K. J., "Environmental Monitoring for Uranium and Neptunium at Yucca Mountain," presented at International High-Level Radioactive Waste Management Conference, Las Vegas, Nevada, April, 1992.