

Karla Riggle Elam, Ph.D.

EXPERIENCE:

Research and 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 Assistance to the Nuclear Regulatory Commission

Criticality safety guidance for low-level radioactive waste emplacement (1/99 – 2/04)
Studies on the effects of fuel failure on criticality safety of spent fuel casks (10/02 – 8/03)

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 – 12/03)

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.

EXPERIENCE (cont.):

Civilian Radioactive Waste Management Fellow, Oak Ridge Associated Universities
9/87 - 5/92

Funded by the DOE Office of Civilian Radioactive Waste Management 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:

Current DOE Q Clearance.

PROFESSIONAL SOCIETIES:

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

RECENT PUBLICATIONS:

Elam, K. R., Criticality Safety Study of UF₆ and UO₂F₂ in 8-in.-Diameter Piping, ORNL/TM-2003/239, October 2003.

Elam, K. R., J. C. Wagner, and C. V. Parks, Scoping Study for the Effects of Fuel Failure on Criticality Safety and Radiation Dose of Spent Fuel Casks, ORNL/TM-2002/255, NUREG-6835, September 2003.

Elam, K. R., "Plexiglas or Concrete-Reflected U(4.46)₃O₈ with H/U=0.77 and Interstitial Moderation," LEU-COMP-THERM-045, 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 2003).

Elam, K. R., and B. T. Rearden, "Use of Sensitivity and Uncertainty Analysis to Select Benchmark Experiments for the Validation of Computer Codes and Data," *Nuclear Science and Engineering*, 145, 196-212 (2003).

Rearden, B. T., and K. R. Elam, Investigations and Recommendations on the Use of Existing Experiments in Criticality Safety Analysis of Nuclear Fuel Cycle Facilities for Weapons-Grade Plutonium, ORNL/TM-2001/262, June 2002.

Elam, K. R., "Water-Reflected ²³³U Uranyl Nitrate Solutions in Simple Geometry," U233-SOL-THERM-005, 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 2001).

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

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