

# KENDRA M. FOLTZ BIEGALSKI, PH.D., P.E.

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**Summary of Qualifications:** 14 years experience in nuclear engineering, nuclear and chemical analytical techniques, and 2 years of nuclear reactor operations. She has 12 years domestic and international experience in scientific research and collaboration as well as 2 years experience in the teaching, training, and licensing of nuclear scientists and nuclear reactor operators.

## Education:

<i>Degree</i>	<i>Major</i>	<i>School</i>	<i>Graduation Year</i>
Ph.D.	Nuclear Engineering	University of Illinois at Urbana-Champaign	1998
M.S.	Nuclear Engineering	University of Illinois at Urbana-Champaign	1995
B.S.	Nuclear Engineering	University of Maryland at College Park	1993

**Certifications:** Professional Engineer in the state of Virginia

## Professional Experience:

<i>Company</i>	<i>From (month/year)</i>	<i>To (month/year)</i>
University of Texas	June 2005	present
<i>Title</i>	<i>Description of Roles and Performance</i>	
Research Engineer	Dr. Foltz Biegalski provides scientific support for an Army Space and Missile Defense Command contract on developing a decomposition algorithm to improve counting statistics and detection limits for nuclear explosion radionuclide measurements. This advances research that she begun at General Dynamics in 2003.	

<i>Company</i>	<i>From (month/year)</i>	<i>To (month/year)</i>
University of Texas	January 2004	May 2005
<i>Title</i>	<i>Description of Roles and Performance</i>	
Research Engineer	Dr. Foltz Biegalski was the project manager and provided scientific support for a contract with Oak Ridge National Laboratory on nonproliferation research. Multi-Attribute Utility Analysis was folded into a graphical user interface to determine proliferation resistance of facilities within the nuclear fuel cycle. She managed a group with a maximum of two engineering students and two computer scientists.	

<i>Company</i>	<i>From (month/year)</i>	<i>To (month/year)</i>
Veridian/General Dynamics	January 2003	September 2003
<i>Title</i>	<i>Description of Roles and Performance</i>	
Senior Nuclear Scientist	Dr. Foltz Biegalski designed an advanced analysis algorithm for the analysis of beta-gamma coincidence noble gas data and provides technical support to the US Verification Monitoring Task Force (VMTF) hosted by the Department of State (DoS).	

**Professional Experience (continued):**

<i>Company</i>	<i>From (month/year)</i>	<i>To (month/year)</i>
Veridian/General Dynamics	January 2002	December 2002
<i>Title</i>	<i>Description of Roles and Performance</i>	
Principal Program Manager, Principal Engineer	Dr. Foltz Biegalski obtained a contract from the Comprehensive Nuclear Test-Ban Treaty Organization for the International Data Center Radionuclide Software Upgrade 2002. She provided direction and scientific support to a small group (3) of scientists and software developers and provided scientific support. Dr. Foltz Biegalski also provided technical support to the US VMTF hosted by the DoS.	

<i>Company</i>	<i>From (month/year)</i>	<i>To (month/year)</i>
Veridian/General Dynamics	February 2000	December 2001
<i>Title</i>	<i>Description of Roles and Performance</i>	
Group Leader of the Comprehensive Nuclear Test-Ban Treaty (CTBT) Transition project	This program was sponsored by the Defense Advanced Research Projects Agency to create a testbed for monitoring nuclear weapons tests via detection and quantification of environmental radionuclides. Dr. Foltz Biegalski provided direction and scientific support to a small group (<10) of scientists and software developers in the development and transition of radionuclide monitoring software from the Prototype International Data Center in Arlington, VA to the International Data Center (IDC) in Vienna, Austria and to the Air Force Technical Applications Center (AFTAC). A letter of commendation was received by DTRA from AFTAC for the work performed by Veridian under this project.	

<i>Company</i>	<i>From (month/year)</i>	<i>To (month/year)</i>
Veridian/General Dynamics	September 1997	January 2000
<i>Title</i>	<i>Description of Roles and Performance</i>	
Nuclear Scientist	Dr. Foltz Biegalski designed both automatic and interactive analysis software for noble gas data and became an internationally recognized expert in the field of noble gas monitoring for CTBT-related purposes. She designed and lectured training courses on noble gas monitoring and the fundamentals of radiation monitoring to international visiting scientists.	

<i>Company</i>	<i>From (month/year)</i>	<i>To (month/year)</i>
University of Illinois	August 1993	January 1998
<i>Title</i>	<i>Description of Roles and Performance</i>	
Graduate Research Fellow	Dr. Foltz Biegalski organized, set-up, and operated a licensed on-campus research facility for radiochemical work with americium. She also worked in conjunction with the University of Illinois Neutron Activation Analysis (NAA) Laboratory in the creation of tracer radionuclides for radioactive waste volume reduction experiments using NAA. With coordination from Argonne National Laboratory, she investigated liquid-liquid extraction and demulsification techniques as volume-reduction treatments for hazardous and non-hazardous liquid scintillation cocktail (LSC) wastes containing transuranic nuclides. Dr. Foltz Biegalski also trained international scientists sponsored by the International Atomic Energy Agency (IAEA) in principles of radiation protection and measurement.	

**Professional Experience (continued):**

<i>Company</i>	<i>From (month/year)</i>	<i>To (month/year)</i>
Risø National Laboratory, Denmark	Summer 1995, June 1996	June 1997
<i>Title</i>	<i>Description of Roles and Performance</i>	
Visiting Scientist	At Risø National Laboratory, Denmark, Dr. Foltz Biegalski analyzed bituminized and other low- to medium-level evaporator concentrates to test the validity of using scaling factors with a reference radionuclide (Cs-137) for activity determinations of plutonium and americium isotopes in bulk waste. She also performed continuation studies on the mechanisms influencing releases from bituminized low- and medium-level wastes using leach tests on samples of various compositions exposed to different environments. Some of the data from this study was used in the on-going verification of modeling codes created at RNL. In addition, Dr. Foltz Biegalski investigated the sorption characteristics of steel corrosion products, with special emphasis on competitive sorption between strontium and sodium, to improve the accuracy of projected releases from radioactive waste disposal systems. Analytical techniques employed in these studies included gamma and alpha spectroscopy, anion exchange, electrodeposition, and flame atomic absorption spectrometry.	

<i>Company</i>	<i>From (month/year)</i>	<i>To (month/year)</i>
Argonne National Laboratory	June 1993	August 1993
<i>Title</i>	<i>Description of Roles and Performance</i>	
Visiting Scientist	Dr. Foltz Biegalski worked with the Separation Science and Technology Section on several waste treatment projects. She performed characterization studies on hazardous and non-hazardous liquid scintillation cocktails (LSCs) and LSC wastes using a liquid scintillation counter, as well as experiments on the conversion of toxic chromium to environmentally inert species.	

<i>Company</i>	<i>From (month/year)</i>	<i>To (month/year)</i>
Virginia Power	June 1992	August 1992
<i>Title</i>	<i>Description of Roles and Performance</i>	
Student Intern	At Surrey Nuclear Power Station, Dr. Foltz Biegalski was a student intern. Responsibilities included plant inspections, collecting performance data, and calculating thermal efficiency values for the secondary cooling loop. She also updated archaic plant software to operate in conjunction with modern database programs.	

<i>Company</i>	<i>From (month/year)</i>	<i>To (month/year)</i>
University of Maryland	September 1990	May 1993
<i>Title</i>	<i>Description of Roles and Performance</i>	
Dept. of Nuclear Engineering Employee	At the University of Maryland's nuclear facilities, Dr. Foltz Biegalski was a senior reactor operator, provided technical expertise to various university committees and groups, and was involved in licensing senior nuclear reactor operators at an open pool TRIGA reactor. In addition, Dr. Foltz Biegalski taught a nuclear engineering lab course at the University of Maryland, College Park (UMCP) and performed research using the nuclear facilities.	

**Technology Areas:** advanced algorithms, analytical modeling, nuclear engineering, nuclear science, project management, test and evaluation, transition planning, training support

**Computing Skills:**

Operating Systems: MS Windows, DOS, UNIX, Macintosh  
Hardware Systems: Nuclear reactor, HPGe detector, NaI(Tl) detector, alpha detector, flame atomic absorption spectrometer, Geiger counter, beta-gamma coincidence detector  
Programming: BASIC, Pascal, Fortran, HTML, JavaScript, and SQL languages  
Software Applications: MCNPX, Canberra Genie sw, RMS nuclear spectroscopy sw, MS Office applications, SigmaPlot, AutoCAD LT, FrameMaker, JEF-PC

**Other Professional Training:** MCNPX (HQC Professional Services, Inc., 2003), Writing Winning Proposals (ShIPLEY Associates course, 2001), PTS-IMS Technical Training Program on Noble Gas Units (Institute for Atmospheric Research, Freiburg, Germany, 2000), Javascript (Montgomery County Community College, 1999)

**Affiliations and Awards:**

Recognition Award from Veridian Systems for work on DTRA IDIQ Proposal (2002)  
Licensed Professional Engineer in the state of Virginia (2001-present)  
University of Illinois Scholarship for Underrepresented Groups in Engineering (1993–1998)  
National Science Foundation fellowship (1993-1996)  
Department of Energy fellowship (1993)  
Summa Cum Laude, University of Maryland at College Park (UMCP) (1993)  
President, Alpha Nu Sigma Honor Society (1992-1993)  
Member, UMCP Academic Planning Advisory Committee Nuclear Reactor Subcommittee (1992)  
Alpha Lambda Delta Honor Society (1992)  
Golden Key National Honor Society (1992)  
Phi Kappa Phi Honor Society (1992)  
Licensed Senior Reactor Operator at the Maryland University Training Reactor (1992-1993)  
Alpha Nu Sigma Honor Society (1991-1993)  
Licensed Reactor Operator at MUTR (1990-1991)  
Society for the Advancement of Materials and Process Engineering scholarship (1990)  
Institute of Nuclear Power Operations scholarship (1989-1993)  
University of Maryland College of Engineering scholarships (1989-1993)  
State of Maryland merit scholarship (1989-1993)  
American Nuclear Society (ANS) awards and scholarships (1989-1994)  
ANS Representative, Council of Engineering Societies (1989-1990)  
Member, ANS (1989–present)

**Seminar, Symposium, or Panel Participation**

ANS Winter Meeting, Washington, D.C., 13-17 November 2005  
ANS Winter Meeting, Washington, D.C., 14-18 November 2004  
6<sup>th</sup> International Conference on Methods of Analytical and Radionuclide Chemistry (MARC-V), Kona, Hawaii, 7-11 April 2003  
International Workshop on Atmospheric Radioxenon Measurements, Richland, Washington, 24-27 September 2002  
CTBTO Radionuclide Laboratory Workshop, Blumau, Austria, 28 August – 1 September 2002  
6<sup>th</sup> Noble Gas Meeting, Papeete, Tahiti, 14-18 January 2002  
CTBTO Noble Gas Technical Workshop, Vienna, Austria 12-14 December 2001  
US/Russian Federation Working Group Meeting, Arlington, VA 25-27 July 2001  
5<sup>th</sup> Noble Gas Meeting, Stockholm, Sweden, 23-27 April 2001  
4<sup>th</sup> Noble Gas Meeting, Freiburg, Germany, 14-15 December 2000  
ANS Winter Meeting, Washington, D.C., 12-16 November 2000

Noble Gas Workshop 2000, Freiburg, Germany, 8-12 May 2000  
5<sup>th</sup> International Conference on Methods of Analytical and Radionuclide Chemistry (MARC-V), Kona, Hawaii, 9-14 April 2000  
2<sup>nd</sup> Noble Gas Meeting, Freiburg, Germany, 11-12 January, 2000  
21<sup>st</sup> Seismic Research Symposium, Las Vegas, 21-24 September 1999  
National American Chemical Society Meeting, New Orleans, 24-28 March 1996  
3<sup>rd</sup> International Meeting on Nuclear Physics for the Protection of the Environment (NPPE-95), Dubna, Russia, 23-28 May 1995  
ANS Winter Meeting, San Francisco, 29 October – 2 November, 1995  
ANS Winter Meeting, Washington, D.C., 13-17 November 1994  
3<sup>rd</sup> International Conference on Methods of Analytical and Radionuclide Chemistry (MARC-III), Kona, Hawaii, 1993

## **Publications**

### *Books*

Formats and Protocols for Messages, IDC3.4.1, rev. 3, contributors: Dave Salzberg, et al., November 2001.

Database Schema, IDC5.1.1 Part 3, rev. 3, contributors: Jerry Carter, et al., November 2001.

IDC Processing of Radionuclide Data, IDC5.2.2, rev.2, contributors: Kendra Biegalski and Hallie Magyar, November 2001.

Analyst Instructions for Radionuclide Data, International Data Centre (IDC) document 6.2.6, rev. 1, contributors: Kendra Biegalski, Steve Biegalski, Steve Hoffert, and Hallie Magyar, November 2000.

Database Schema, IDC5.1.1 Part 3, rev. 2, contributors: Kendra Biegalski, et al., November 2000.

Formats and Protocols for Messages, IDC3.4.1, rev. 2, contributors: Kendra Biegalski, et al., November 2000.

IDC Processing of Radionuclide Data, IDC5.2.2, rev.1, contributors: Kendra Biegalski, Hallie Magyar, and Joel Rynes, November 2000.

Radionuclide Software Design, IDC7.1.10, rev. 1, contributors: Kendra Biegalski, et al., November 2000.

Radionuclide Software User Manual, IDC6.5.10, rev. 1, contributors: Kendra Biegalski, et al., November 2000.

Formats and Protocols for Messages, IDC3.4.1, rev. 1, contributors: Kendra Biegalski et al., March 1999.

IDC Processing of Radionuclide Data, IDC5.2.2, rev. 0, contributors: Kendra Biegalski, John Bohner, and Chellyn Rinehart, March 1999.

Disposal of Bituminized and Other Low- and Medium-Level Wastes: Waste Characterization & the Retention of Migrating Radionuclides by Steel Corrosion Products, thesis, University of Illinois at Urbana-Champaign, 1998.

Removal of Actinide Elements from Liquid Scintillation Cocktail Wastes Using Liquid-Liquid Extraction and Demulsification Techniques, thesis, University of Illinois at Urbana-Champaign, 1995.

### *Journal Articles*

V. Pratt, K. Foltz Biegalski, S. Landsberger, "Development of the Nonproliferation Assessment Tool (NAT) Software Package for the Calculation of Proliferation Resistance Values of Nuclear Fuel Cycle Facilities," in press *Journal of Nuclear and Materials Management*, 2006.

S. Landsberger, D. J. O'Kelly, S. Biegalski, S. O'Kelly, K. Foltz Biegalski, L. Welch, L. Katz, "Development of a Graduate Curriculum in Nuclear and Radiochemistry and the Research Interactions with US Department of Energy National Laboratories," in press *Journal of Radioanalytical and Nuclear Chemistry*, 2006.

D. A. Haas, S. R. Biegalski, K. M. Foltz Biegalski, "Modeling  $\beta$ - $\gamma$  Coincidence Spectra of  $^{131m}\text{Xe}$ ,  $^{133}\text{Xe}$ ,  $^{133m}\text{Xe}$ , and  $^{135}\text{Xe}$  Signals," in press *Journal of Radioanalytical and Nuclear Chemistry*, 2006.

K. M. Foltz Biegalski, S. R. Biegalski, D. Haas, "Performance Evaluation of Spectral Deconvolution Analysis Tool (SDAT) Software Used for Nuclear Explosion Radionuclide Measurements," in press *Journal of Radioanalytical and Nuclear Chemistry*, 2006.

K. M. Foltz Biegalski, V. S. Pratt, T. Pintel, S. Landsberger, M. Whitaker, "Using Nonproliferation Assessment Tool Software (NAT) for Teaching Proliferation Concepts Regarding the Nuclear Fuel Cycle," Proceedings of the ASEE 2006 Annual Conference, 2006-1235, 2006.

E. Schneider, K. Foltz Biegalski, S. Landsberger, S. Biegalski, "Educational Achievements in Nuclear and Radiochemistry at the University of Texas at Austin," Proceedings of the ASEE 2006 Annual Conference, 2006-1226, 2006.

V. S. Pratt, K. M. Foltz Biegalski, T. Pintel, S. Landsberger, "Nonproliferation Assessment Tool Software" *ANS Transactions*, 93:336, Washington, D.C., 2005.

S. R. Biegalski, K. M. Foltz Biegalski, and D. A. Haas, "Development of the Spectral Deconvolution Analysis Tool (SDAT) to Improve Counting Statistics and Detection Limits for Nuclear Explosion Radionuclide Measurements" Proceedings for the 27<sup>th</sup> Seismic Research Review, Palm Spring, CA, 2005.

K. M. Foltz Biegalski and S. R. Biegalski, "Deconvolution of Three-Dimensional Beta-Gamma Coincidence Spectra from Xenon Sampling Units," *Journal of Radioanalytical and Nuclear Chemistry*, 263 (1) 259, 2005.

V. S. Pratt, K. M. Foltz Biegalski, T. Pintel, E. Strassberg, S. Landsberger, "Development of Nonproliferation Assessment Tool Software" *ANS Transactions*, 91:309, Washington, D.C., 2004.

D. Robbins, K. Biegalski, "Radionuclide Software Installation at the US National Data Center", Proceedings for the 24<sup>th</sup> Seismic Research Review, Ponte Vedra Beach, 2002.

D. Penn, S. Biegalski, K. Biegalski, "Status of the Automated Radioxenon Sampler Analyzer, and the International Noble Gas Experiment", Proceedings for the 24<sup>th</sup> Seismic Research Review, Ponte Vedra Beach, 2002.

K. Biegalski, "Automatic Analysis Algorithm for Radionuclide Pulse Height Data from Beta-Gamma Coincidence Systems", *Journal of Radioanalytical and Nuclear Chemistry*, 248 (3) 663, 2001.

K. Biegalski, S. R. Biegalski, "Determining Detection Limits and Minimum Detectable Concentrations for Noble Gas Detectors Utilizing Beta-Gamma Coincidence Systems", *Journal of Radioanalytical and Nuclear Chemistry*, 248 (3) 673, 2001.

J. Rynes, K. Biegalski, and P. Donohoe, "Automatic and Interactive Analysis Software for the Beta-Gamma Coincidence Systems used in CTBT Monitoring," Proceedings for the 22<sup>nd</sup> Seismic Symposium, Las Vegas, 2000.

K. Biegalski, J. Rynes, P. Donohoe, and S. Biegalski, "Automatic and Interactive Analysis Software for Beta-Gamma Coincidence Systems" *ANS Transactions*, 83:121, Washington, D.C., 2000.

K. Biegalski, S. R. Biegalski, "Utilizing Detection Limit Calculations for  $\beta$ - $\gamma$  Coincidence Histograms to Optimize Sampling Methodology," Proceedings for the 21<sup>st</sup> Seismic Research Symposium: Technologies for Monitoring The Comprehensive Nuclear-Test-Ban Treaty, 1999.

K. Biegalski, S. Biegalski, and D. Williams, "Medical Industry Interference with CTBT Monitoring of Atmospheric Radionuclides", Proceedings of the 21<sup>st</sup> Seismic Symposium: Technologies for Monitoring The Comprehensive Nuclear-Test-Ban Treaty, vol. II, Las Vegas, Sept. 21-24, 1999.

K. Foltz, "The International Atomic Energy Agency and The Treaty on the Non-Proliferation of Nuclear Weapons: A Critical Review of Their Roles in the Present Non-Proliferation Regime," in *The 1995 Review and Extension of the Nuclear Non-Proliferation Treaty*, ed. T. Morgan, J. Zych, and C. E. Singer, ACDIS, University of Illinois at Urbana-Champaign, December, 1996.

K. Brodersen, S. Carugati, and K. Foltz, "Estimation of Plutonium Content in Bitumenized Waste Processes at Risø National Laboratory Using Isotope Ratios", *ANS Transactions*, 73:121, San Francisco, Oct. 29 - Nov. 2, 1995.

S. Landsberger, K. Foltz, et al., "Activation Analysis in Radioactive Waste Management Studies", Proceedings for the 3<sup>rd</sup> International Meeting Nuclear Physics for the Protection of the Environment, NPPE-95, Dubna, Russia, May 23-28, 1995.

K. Foltz, S. Landsberger, B. Srinivasan, and C. Vandegrift, "Removal of Actinide Elements from Liquid Scintillation Cocktail Wastes Using Liquid-Liquid Extraction and Demulsification Techniques", *ANS Transactions*, 71:100, Washington, D.C., 1994.