

Jennifer L. Ladd-Lively, Ph.D., PMP

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Accomplishments:

- Twenty-one years of chemical engineering experience working at Oak Ridge National Laboratory (ORNL) including student internships, with 17 years as a full-time employee
- Fourteen years of project and program management experience
- Led, supported, and/or managed over 100 research projects in Safeguards, Nuclear Nonproliferation, National Security, and Nuclear Forensics
- Currently managing a research portfolio of more than \$50M annual funding
- Experienced in nuclear fuel cycle process, including uranium chemistry, chemical processing, nuclear safeguards, and signatures and observables identification
- Coordinated and implemented large-scale, multi-laboratory teams, research projects, and field campaigns
- Regularly planned and hosted large technical events such as program reviews
- Section Head for the Proliferation Detection and Deterrence Section within the Nuclear Nonproliferation Division
- ORNL program manager for the NNSA Office of Defense Nuclear Nonproliferation Research and Development (DNN R&D), National Technical Nuclear Forensics Center (NTNFC) of the Department of Homeland Security (DHS) Countering Weapons of Mass Destruction (CWMD) Office, and the Department of Energy (DOE) Office of Nuclear Energy Nuclear Energy Emerging Technologies (NEET) Advanced Sensors and Instrumentation (ASI) Program
- Active DOE Q and SCI clearances
- PMP Certified Project Manager

Skills:

- Expert in Microsoft Office Suite including Word, Excel, and PowerPoint
- Proficient in Microsoft Project
- Proficient in Adobe including Acrobat, Photoshop, and Lightroom
- Proficient in MATLAB
- Working knowledge of WordPress
- Excellent written and verbal communication skills
- Excellent technical writing and editing skills
- Excellent leadership skills

Education:

- 2016 *Business Essentials Certificate*, Kenan-Flagler Business School, University of North Carolina, Chapel Hill, NC
- 2013 *Ph.D.*, University of Tennessee, Knoxville, TN
Chemical Engineering
Dissertation: "Development of a Monitoring Framework for the Detection of Diversion of Intermediate Products in a Generic Natural Uranium Conversion Plant" (http://trace.tennessee.edu/utk_graddiss/2586/)
Committee: Dr. Tsewei Wang (Chair), Dr. Robert M. Counce, Dr. Alan S. Icenhour, Dr. Paul D. Frymier, and Dr. John M. Begovich
Graduated: December 2013
GPA 3.92/4.0
- 2004 *M.S.*, University of Tennessee, Knoxville, TN
Chemical Engineering

Thesis: “Separation of Fluoride Residue Arising from Fluoride Volatility Recovery of Uranium from Spent Nuclear Fuel” (http://trace.tennessee.edu/utk_gradthes/2557/)

Committee: Dr. Robert M. Counce (Chair), Dr. Barry B. Spencer, Dr. Paul Bienkowski, Dr. Fred Weber

Graduated: May 2004

GPA 3.92/4.0

- 2002 *B.S.*, Tennessee Technological University, Cookeville, TN
Chemical Engineering with Minors in Chemistry and Mathematics
Summa Cum Laude
Dean’s List, Mortar Board, Omicron Delta Kappa (The National Leadership Honor Society), Omega Chi Epsilon (Honor Society, Chemical Engineering), Honor Society of Phi Kappa Phi
Graduated: May 2002
GPA 3.926/4.0
- 2000 *A.S.*, Roane State Community College, Harriman, TN
Chemical Engineering
Summa Cum Laude, Honors Program
Dean’s List, Outstanding Freshman Award Nominee, Freshman Math Award, Calculus Based Physics Award, Outstanding Pre-Engineering Award, Sophomore Mathematics Award, Academic Achievement Award, Presidential Award Nominee
Graduated: May 2000
GPA 4.0/4.0

Research and Professional Experience:

Oak Ridge National Laboratory, Oak Ridge, TN

October 2020–present

Distinguished R&D Staff and Section Head—Oak Ridge National Laboratory, National Security Sciences Directorate (NSSD), Nuclear Nonproliferation Division (NND), Proliferation Detection and Deterrence (PDD) Section

- Section Head Role
 - Manage a section of 5 groups with over 70 research staff, technicians, post docs, students, and subcontractors. Serve as direct supervisor for section group leaders.
 - Work closely with the division director and group leaders within the section to develop a vision and implement a strategy to pursue world-leading science and technology directions for the section. Demonstrate cross-functional team leadership.
 - Support division director in the operations of the division and represent director when director is not available.
 - Work with section group leaders to establish, communicate, and measure critical metrics for success and impact.
 - Actively contribute to shaping the division’s, directorate’s, and laboratory’s research plans and investments.
 - Build strong teams by collaborating across ORNL and securing external expertise when needed. Leverage ORNL facilities and resources when developing new projects.
 - Work with the group leaders and the division director to assess and calibrate individual staff performance across the section. Evaluate progress regularly, providing feedback and addressing performance issues in a timely manner.
 - Develop and implement succession planning with input from group leaders for all critical positions in the section to ensure future success.
 - Ensure groups are recruiting and hiring from a diverse pool of top candidates who are committed to world-class research and aspire to be the best in their field. Approve job offers.
 - Drive staff promotions and development.
 - Address in a timely manner all concerns expressed by staff and any disciplinary actions.

- Lead by example, using the principles in ORNL's Research Code of Conduct exhibit as a guide for proposing, performing, and communicating research and in dealing with others.
- Employ best practices, such as holding regular meetings, being visible in the workplace, monitoring budgets, acknowledging sponsors, and adhering to ORNL business systems requirements regarding staff requests for foreign travel and submission of quality proposals.
- Coach and mentor staff regarding Battelle's Safe Conduct of Research principles and ensure all work is carried out safely, securely, and in compliance with ORNL policies, standards, and procedures.
- Exemplify a commitment to "One ORNL" by modeling lab expectations for excellence in research, operations, and community engagement, and by working cooperatively to leverage capabilities across the lab.
- Program Manager Role
 - Program manager for the Defense Nuclear Nonproliferation R&D (DNN R&D/NA-22) Office.
 - Program manager for the National Technical Nuclear Forensics Center (NTNFC) of the Department of Homeland Security (DHS) Countering Weapons of Mass Destruction (CWMD) Office.
 - Technical Point of Contact (TPOC) for Department of Office (DOE) Office of Nuclear Energy Nuclear Energy Emerging Technologies (NEET) Advanced Sensors and Instrumentation (ASI) Program.
 - Assisted in the preparation of proposals providing technical review and feedback. Ensured that the correct requirements were followed for each proposal call.
 - Interfaced with stakeholders, program managers, collaborators, and research staff on multiple research projects.
 - Ensured timely delivery of reports and project documentation.
 - Assisted PIs with preparation of and modifications and updates to project documentation and reports including technical and classification review.
 - Prepared monthly and quarterly technical reports and financial updates.
 - Organized and participated in independent reviews of research projects.
 - Authorized Derivative Classifier and regularly reviewed documents for classification.
 - Planned agendas for and hosted sponsors and stakeholders for project updates and laboratory tours.
 - Assisted in the planning of and supported numerous collection campaigns as part of the campaign director team.
 - Participated in the NTNFC Uranium Expert Panel, including providing presentations. The expert panel meets bi-annually and assists DHS with interagency collaborations and technical direction for the Uranium Signatures projects.
- Researcher Role
 - Lead principal investigator (PI), project manager, or research team member on multiple research projects.
 - Led and/or contributed to the preparation of numerous proposals to several sponsors, including DOE, NA-22, NA-24, DTRA, and DHS; many of which were multi-laboratory.
 - Attended and/or presented research projects at program review meetings, conferences, and working group meetings.
 - Continued as lead PI for the DNN R&D funding multi-laboratory Manufacturing and Production Signatures (MaPS) project (started FY16 and is on-going; over \$2.2M was highest year of total funding).
 - Continued as deputy PI for the DNN R&D funded multi-laboratory Coordinated Signatures Investigation (CSI) project (started FY14 and is on-going; \$6–7M total annual funding).
 - Continued leading training exercises at NNSS for the UVT. Small team was deployed for specific training in April 2021.
 - Continued as a research team member supporting the DNN R&D funding multi-laboratory Focused Experiments and Analytics for Research in Detection (FEARD) project (started FY19 and is on-going; ~\$1.1M total annual funding) and the ORNL PI for Los Alamos led REDACT II: Aluta Continua (started FY19 and is on-going; \$1.0M total annual funding) and Understanding the Propagation of Power and Vibration Signals within Facilities (started FY19 and is on-going; ~\$800k total annual funding) projects.
 - Co-PI for the DNN R&D funding multi-laboratory ORNL led Uranium Signatures Testbeds project (started FY21 and planned as a five-year project; initial funding request is \$2M total annual project

funding). The objectives of this project are: (1) investigate the creation, propagation, and utility of nuclear forensic characteristics in uranium-bearing material as it progresses through the fuel and weapon cycles and is exposed to specific environments and (2) use a science-based approach to model and validate potential signatures for assessing the provenance and transit history of materials discovered outside regulatory control. This work builds on the DHS funded Development of Predictive Signatures for Uranium Processing work that started in 2007.

- ORNL PI for the DNN R&D funding multi-laboratory Sandia National Laboratories led Materials by Design Scoping Study project (started FY21 for one year; \$750k total project funding). This project is a scoping study to determine how materials by design can be used to support proliferation detection activities, as well as determine the threat from a proliferator using this technique to advance a nuclear weapons program.

September 2018–September 2020

Senior R&D Staff and Group Leader—Oak Ridge National Laboratory, Electrical and Electronics Systems Research Division, Electrical Systems Engineering and Integration Group

- Group Leader Role
 - Served as direct supervisor for a group of 18 research staff, technicians, and subcontractors.
 - Developed a vision and implement a cohesive group research strategy to ensure the success of new and ongoing research projects to position the group for future success.
 - Developed and implement plans to exploit new opportunities and expand existing efforts.
 - Assisted staff in setting performance goals consistent with the group's strategy and members' long-term career goals. Provided feedback to address performance issues in a timely manner.
 - Provided relevant input to assist with staff development while providing direct and impactful guidance to staff on a regular basis.
 - Attracted a quality, diverse pool of top candidates and hire staff members who are committed to world-class R&D and aspire to be the best in their field.
 - Led by example, using the principles in ORNL's Research Code of Conduct exhibit as a guide for proposing, performing, and communicating research.
 - Coached and mentored staff regarding Battelle's Safe Conduct of Research principles.
 - Demonstrated integration of ESH&Q principles into management and ensure all work is carried out safely, securely, and in compliance with ORNL policies, standards, and procedures. Mentored and empowered the laboratory space managers to create a strong safety culture.
 - Exemplified a commitment to "One ORNL" by modeling lab expectations for excellence in research, operations, and community engagement, and by working cooperatively to leverage capabilities across the lab.
 - Supported group members by consistently reviewing technical products such as proposals, publications, and artifacts to ensure high quality and consistency with ORNL standards.
 - Built strong teams across ORNL.
 - Held regular scientific/technical group meetings and be visible in the labs and workplace.
 - Effectively communicated the importance of protecting proprietary or sensitive information and complying with ORNL cybersecurity policies and guidelines.
- Program Manager Role
 - Program manager for the Defense Nuclear Nonproliferation R&D (DNN R&D/NA-22) Office.
 - Program manager for the National Technical Nuclear Forensics Center (NTNFC) of the Department of Homeland Security (DHS) Countering Weapons of Mass Destruction (CWMD) Office.
 - Technical Point of Contact (TPOC) for Department of Office (DOE) Office of Nuclear Energy Nuclear Energy Emerging Technologies (NEET) Advanced Sensors and Instrumentation (ASI) Program.
 - Assisted in the preparation of proposals providing technical review and feedback. Ensured that the correct requirements were followed for each proposal call.
 - Interfaced with stakeholders, program managers, collaborators, and research staff on multiple research projects.

- Ensured timely delivery of reports and project documentation.
- Assisted PIs with preparation of and modifications and updates to project documentation and reports including technical and classification review.
- Prepared monthly and quarterly technical reports and financial updates.
- Organized and participated in independent reviews of research projects.
- Authorized Derivative Classifier and regularly reviewed documents for classification.
- Planned agendas for and hosted sponsors and stakeholders for project updates and laboratory tours.
- Assisted in the planning of and supported numerous collection campaigns as part of the campaign director team.
- Participated in the NTNFC Uranium Expert Panel, including providing presentations. The expert panel meets bi-annually and assists DHS with interagency collaborations and technical direction for the Uranium Signatures projects.
- Technical and logistical host for the DNN R&D Special Nuclear Material Weaponization Research & Development (SWRD) Program Review Meeting 14–16 May 2019. Approximately 200 people registered for the meeting. The purpose of the SWRD Program Review was to showcase new developments and advances at US Department of Energy/National Nuclear Security Administration (DOE/NNSA) national laboratories in next-generation technologies and methods across the nuclear fuel cycle and nuclear weapons development processes. SWRD focused on special nuclear material production detection, weaponization development detection, remote detection, the innovation program, and nuclear forensics.
- **Researcher Role**
 - Lead principal investigator (PI), project manager, or research team member on multiple research projects.
 - Led and/or contributed to the preparation of numerous proposals to several sponsors, including DOE, NA-22, NA-24, DTRA, and DHS; many of which were multi-laboratory.
 - Attended and/or presented research projects at program review meetings, conferences, and working group meetings.
 - Continued as lead PI for the DNN R&D funding multi-laboratory Manufacturing and Production Signatures (MaPS) project (started FY16 and is on-going; over \$2.2M was highest year of total funding).
 - Continued as deputy PI for the DNN R&D funded multi-laboratory Coordinated Signatures Investigation (CSI) project (started FY14 and is on-going; \$6–7M total annual funding).
 - Research team member supporting the DNN R&D funding multi-laboratory Focused Experiments and Analytics for Research in Detection (FEARD) project (started FY19 and is on-going; ~\$1.1M total annual funding) and ORNL PI for Los Alamos led REDACT II: Aluta Continua (started FY19 and is on-going; \$1.0M total annual funding) and Understanding the Propagation of Power and Vibration Signals within Facilities (started FY19 and is on-going; ~\$800k total annual funding) projects. These projects work collaboratively toward further advancing capabilities to characterize activities of interest using electrical signals through focused experiments and analysis as well as collections efforts at testbeds.
 - Lead an effort to conduct scenario-based training exercises as Nevada National Security Site (NNSS) for the DNN’s Office of Nonproliferation and Arms Control (NPAC) funded Uranium Verification Team (UVT). The training and exercises are conducted according to the Verification Team Training/Exercise Development Strategic Plan (2020–2024) to successfully meet the range of deployment objectives identified in the NCV Verification Deployment Scenarios. NPAC is ready to deploy teams and technologies to monitor and verify the operating status, fissile material inventory, process history, and disablement/dismantlement of any foreign nuclear fuel cycle facility. One training was conducted during 2019 and another planned but cancelled in 2020 due to COVID-19.

December 2009–August 2018

R&D Staff—Oak Ridge National Laboratory, Nuclear Security and Isotope Technology Division, Process Engineering Research Group (until September 2013) then National Security Advanced Technology Group (until August 2018)

- **Program Manager Role**
 - Program manager for the Defense Nuclear Nonproliferation R&D (DNN R&D/NA-22) Nuclear Weaponization and Material Production Detection (MPD) team starting in 2013.

- Program manager for the National Technical Nuclear Forensics Center (NTNFC) of the Department of Homeland Security (DHS) Domestic Nuclear Detection Office (DNDO) starting in 2013.
- Participate on the Forensic Science Initiative (FSI) and the Nuclear Threat R&D Initiative working groups.
- Assisted in the preparation of proposals providing technical review and feedback. Ensured that the correct requirements were followed for each proposal call.
- Interfaced with stakeholders, program managers, collaborators, and research staff on multiple research projects.
- Ensured timely delivery of reports and project documentation.
- Assisted PIs with preparation of and modifications and updates to project documentation and reports including technical and classification review.
- Prepared monthly and quarterly technical reports and financial updates.
- Organized and participated in independent reviews of research projects.
- Authorized Derivative Classifier and regularly reviewed documents for classification.
- Planned agendas for and hosted sponsors and stakeholders for project updates and laboratory tours.
- Technical and logistical host, as well as meeting planner, for the DNN R&D MPD Team Program Review in 2014 and 2016 both of which had ~275 registered attendees.
- Organized, planned, and hosted the 5-day Interagency Technical Nuclear Forensics Program Review (ITNFPR) in July 2017 and Interagency Technical Nuclear Forensics Technical Review (ITNFTR) in July 2018 which represented research efforts from five federal programs and had over 250 registered attendees both years.
- Organized, planned, and hosted the 3-day NTNFC sponsored Overview of Nuclear Forensics for the Federal Workforce in 2015 and 2016. Approximately 25 students take the course each time it is offered.
- Attended and participated in monthly teleconferences and webinars for NTNFC and hosted one technical webinar annually.
- Participated in the NTNFC Uranium Expert Panel, including providing presentations. The expert panel meets bi-annually and assists DHS with interagency collaborations and technical direction for the Uranium Signatures projects.
- Assisted in the planning of and supported numerous collection campaigns as part of the campaign director team.
- Researcher Role
 - Lead principal investigator (PI), project manager, or research team member on multiple research projects.
 - Led and/or contributed to the preparation of numerous proposals to several sponsors, including DOE, NA-22, NA-24, DTRA, and DHS; many of which were multi-laboratory.
 - Attended and/or presented research projects at program review meetings, conferences, and working group meetings.
 - Lead PI for the DNN R&D funding multi-laboratory Manufacturing and Production Signatures (MaPS) project (started FY16 and is on-going; over \$2.2M was highest year of total funding). The MaPS project targets specific manufacturing and production paths and leverage existing facilities to characterize signatures, both machine/activity specific and process (i.e., temporal). This data is then be processed by novel analysis “signature discovery” approaches where cross-correlation of signal types will reveal and provide robust detection methods. The MaPS project will generate an initial integrated approach which reconciles discovered signatures with their relevance to both manufacturing operations and potential remote detection. Completed four installation efforts between two off-site locations for the collection of signals data. Completed four materials collections efforts for effluents of interest. Completed three collection campaigns for both materials and signals. This project shows successful integration of multiple research approaches to better solve the problem.
 - Deputy PI for the DNN R&D funded multi-laboratory Coordinated Signatures Investigation (CSI) project (started FY14 and is on-going; \$6–7M total annual funding). The product of this endeavor will be a deeper understanding of signatures originating from fuel reprocessing activities and an increased confidence in assessments made from current, developing, and composited signatures. The utility of

accepted and developing signatures and technologies to detect, locate, and characterize reprocessing activities will be evaluated against four unique test bed facilities and multiple scenarios. These investigations are designed to probe the utility and robustness of the signatures, including the impact of process, environment, and irradiated fuel characteristics on the ability to make confident conclusions from stack and particulate effluents, and thermal signatures.

- Deputy PI for DNN R&D funded multi-laboratory Detection, Location, and Characterization of an MLIS Facility (FY14–17; \$5.820M total project funding).
- Participant on DNN R&D funded scoping studies: (1) Scoping Study to Detect, Locate, and Characterize Undeclared Fuel and Target Fabrication (FY16–17) and (2) Seismoacoustic and Electromagnetic Signatures in Pu Metal Production (FY16). Scoping studies are generally one-year efforts to determine the current state of the art, determine gaps that exist, and make recommendations to DNN R&D for more extensive studies in a particular area.
- Research team member for DNN R&D funded Attributes of Aerodynamic Processes project (FY15–16; \$800k total project funding). The purpose of this project was to provide a more comprehensive understanding of aerodynamic processes and their observables in order to recommend how current capabilities can be utilized, what detection gaps exist, and what level and type of signature validation is needed.
- Supported the Department of State-funded nuclear forensics demonstration “Counter Nuclear Pilfering Workshop” held 5–6 November 2014 by assisting in the preparation of the scenario and scripts and by participating in the demonstration scenes.
- Provided research support to USEC for review of documentation, sampling and analysis activities, and site visits.
- Conducted material compatibility and comparison testing for DOE-IN.
- Continued to provide support and leadership to Production of Fully Pedigreed Prototypic Uranium Material until turning over the project to another researcher when departing for the off-site assignment. Organized and participated in an independent review of the project. Ensured planned research tasks were completed and properly reported. Presented the project at the Joint Program Review.
- Continued to provide support and leadership to the Uranyl Nitrate Calibration Loop Equipment (UNCLE) Project until turning over the project to another researcher when departing for the off-site assignment. A summary of the tool, including its purpose, how it works, how it is configured, the successful demonstration in the United Kingdom, our lessons learned from that demonstration, and the steps we have taken since then to improve the tool was presented during the Permanent Coordinating Group (PCG) meetings in December 2009. Additional modifications and improvements were made to the testing equipment. An update of the UNCLE project was presented at the Annual Meeting of the Institute of Nuclear Materials Management (INMM) in 2010.
- Continued to provide project management support for the Coupled End-to-End (CETE) Sampling and Fuel Cycle Signatures Projects funded by DNN R&D. Interfaced between collaborators from other national laboratories and ORNL CETE demo personnel. Participated in a data review was conducted at the Department of Energy in Washington, D.C. Presented the project at the Joint Program Review.

September 2010–August 2013

Technical Advisor (Off-site assignment in D.C.)—Nuclear Weaponization and Material Production Detection (MPD) Team, NNSA Office of Defense Nuclear Nonproliferation Research and Development (DNN R&D, NA-22), Contractor from Oak Ridge National Laboratory

- Technical Advisor to the Signatures and Observables (S&O) Program as well as interim technical advisor to the U-235 Production Detection Program until those programs were reorganized as part of the MPD Team in 2012.
- Provided technical advice primarily to the leader of the S&O program and the U-235 Production Detection program then to all members of the MPD Team.

- Provided technical advice on identifying and developing research requirements and new project scope based on evolving policy and technology development, and on developing technical programmatic recommendations for future initiatives.
- Assisted laboratories with modifications and updates to project documentation. Utilized the web-based project management interface system (WebPMIS) for project management.
- Interfaced with laboratory program managers and PIs about current and proposed projects.
- Attended and participated in various program review meetings, working group meetings, and conferences.
- Assisted in the planning of the MPWD program review meeting in 2011 and 2012. The MPWD program review was a joint review of five DNN R&D programs including the S&O program.
- Organized, attended, and participated in NA-22 S&O Coordinating Review Group meetings held quarterly or semi-annually and prepared documents to guide research investments of the NA-22 S&O Program.
- Visited the national laboratories and attended project briefings.
- Supported several field campaigns through planning, participation in working group meetings, reviewing the test plans, providing support during the campaign, and attending the information exchange meetings following the campaigns.
- Assisted in the preparation of the strategy documents including the Goals, Objectives, and Requirements document as well as the team implementation plan and integrated priority list for the S&O Program and the MPD Team.
- Provided technical assessments of the progress of funded projects within the MPD Team and assessments of the ability of these projects to address target requirements.
- Assisted in design of BAAs, SBIRs, and national laboratory R&D proposal call topic areas relevant to DNN R&D Mission needs and assisted with evaluation of office and partner agency solicitations and review of proposals.
- Provided quantitative evaluations of methods for the MPD Team improvements.
- Assisted in the evaluation of other government agency programs for technical compatibility and coordination with DNN R&D and assisted with exchange of technical information.
- Provided analysis in support of the design and development of product test and evaluation plans for the NNSA and OGA R&D test activities.
- Compiled and provided content for the S&O Program Annual Report.

January 2007–November 2009

R&D Associate—Oak Ridge National Laboratory, Nuclear Science and Technology Division, Process Engineering Research Group

- Program Manager Role
 - Program manager for the NA-22 Signatures and Observables (S&O) program from August 2008 until August 2010.
 - Representative to the NNSA NA-22 Coordinating Review Group which met quarterly and prepared documents to guide research investments of the NA-22 S&O Program.
 - Participated on the NNSA NA-22 Uranium Production Detection Program Road Mapping Working Group which developed a road map for the program to direct funding for a 10-year period.
 - Participated on the Forensic Science Initiative (FSI) working group.
- Researcher Role
 - Lead principal investigator (PI), project manager, or research team member on multiple research projects.
 - Led and/or contributed to the preparation of multiple proposals to numerous sponsors, including DOE, NA-22, NA-24, NA-47, and DHS.
 - Presented research projects at program review meetings, conferences, and working group meetings.
 - Interfaced with stakeholders, program managers, collaborators, and research staff on multiple research projects.
 - Coordinated procurement of equipment, prepared necessary work control documents, and overseen installation of equipment required for research activities.

- Principal investigator on the NA-24 funded Uranyl Nitrate Calibration Loop Equipment (UNCLE) Project. Oversaw construction of a Uranyl Nitrate Calibration Facility as part of the Uranyl Nitrate Calibration Loop Equipment (UNCLE) Project which served as the keystone for establishing building 4501 as a center for uranium processing excellence. Designed the calibration loop, selected instrumentation and equipment, procured necessary parts of the calibration loop, completed "cold" testing, completed calibration of the Los Alamos National Lab-developed neutron detector, and completed initial testing of the full system. An update of the UNCLE project was presented at the Annual Meeting of the Institute of Nuclear Materials Management (INMM) in 2008 and 2009.
- Principal investigator on the project to develop a capability at ORNL for the production of fully pedigreed uranium materials for the DHS effort on predictive signatures for uranium processing activities. Identified and evaluated flowsheets for production which were presented at the DHS DNDO program review in 2008. Leveraged the DHS funded effort to obtain NA-22 funding for uranium production research. Coordinated procurement of equipment, prepared necessary work control documents, and overseen installation of equipment required for testing. This effort further developed the 4501 High Bay laboratory space and is still on-going in 2021.
- Project manager for the Coupled End-to-End (CETE) Sampling and Fuel Cycle Signatures Projects. Interfaced between collaborators from other national laboratories and ORNL CETE demo personnel. Organized and participated in an independent review of the project. Presented "Fuel Cycle Signatures: Equipment and Operations for CETE Demo" at the program review meeting. Participated in and supported collaborators during collection activities.
- Continued as an experimental assistant and team member on the Carbonate Cycle for the Thermochemical Production of Hydrogen project. Conducted a large fraction of the experiments.
- Engineering and planning assistant to the Global Nuclear Energy Partnership (GNEP) Coupled-End-To-End Demonstration Head-end Segment Lead for the setup of the voloxidation tube washing step.
- Chemical engineer on a team of technical experts participating in the design, assembly, and experimentation of unique research and development equipment in support of national security initiatives for U. S. Government agencies. Worked on the design of experiments, design and assembly of experimental apparatus configurations, development of test plans, conduct of tests, troubleshooting, and analysis of results as a part of research into instrument and equipment critical to National Security applications.

June 2004–December 2006

R&D Assistant—Oak Ridge National Laboratory, Nuclear Science and Technology Division, Process Engineering Research Group

- **Researcher Role**

- Principal Investigator (PI) or research team member on multiple research projects.
- Led and/or contributed to the preparation of multiple proposals to numerous sponsors, including NA-22, NA-42, NA-24, NERI, and the ORNL Seed money committee.
- Presented research projects at program review meetings and conferences.
- Interfaced with stakeholders, program managers, collaborators, and research staff on multiple research projects.
- Completed LabView Basics I and II training (December 2004).
- Principal Investigator (PI) in the establishment and operation of a uranyl nitrate flow loop beginning in 2004 and completing the project in 2007 and funded by NA-24. The flow loop was designed for the assessment of various types of instruments with the potential for application in the nuclear safeguards arena. Researched flow measurement technology, developed a list of recommended flowmeter options, and ultimately procured three representative flowmeters for evaluation; designed a test loop to evaluate the performance of the selected equipment; interfaced with technical support personnel and skilled workers to install the test system and develop the necessary control system software; calibrated the flowmeters with water; worked with various ORNL personnel to prepare the necessary uranyl nitrate solution; and successfully tested the equipment with varying uranyl nitrate liquid flow rates and varying

flow rates of air. Worked with several collaborators on-site and off-site at Los Alamos National Laboratory and Brookhaven National Laboratory. Accompanied the project sponsor on a fact-finding trip to the United Kingdom that expanded the project and set the stage for field testing of a specific flowmeter in an actual operating natural uranium conversion plant during FY 2006. Selected a Coriolis meter for field evaluation at the Springfields facility in the UK. Worked with Springfields personnel as well as personnel from Los Alamos National Laboratory and DOE headquarters to successfully coordinate and complete the field deployment and testing of the uranium flow monitoring field test equipment. Representatives from the International Atomic Energy Agency (IAEA) conducted a site visit to the Springfields facility to witness the installation and review the performance of the system. Provided weekly and monthly written status updates in a timely manner. Prepared a papers and presentations for the Annual Meeting of the Institute of Nuclear Materials Management (INMM) in 2006 and 2007. The final report was entitled “Uranyl Nitrate Flow Loop” (ORNL/TM-2008/048). The success of this work and the Springfields Natural Uranium Conversion Plant field demonstration was key to the decision to conduct the follow-on UNCLE Experiment at ORNL.

- Lead researcher on a compilation report of historical releases of radioactivity for the Department of Homeland Security (DHS). The report entitled, Survey of Significant Historical Releases of Nuclear Materials (ORNL/TM-2005/153 issued in May 2006), built upon a preliminary literature search conducted by another research staff member. Incorporated a considerable number of additional references and events into the document and provided an excellent overview of numerous nuclear material releases throughout the history of the nuclear industry. The task posed several challenges in terms of finding actual relevant data from unclassified historical documents as well as limiting the scope to events of interest to the sponsor.
- Team member that completed statistical analysis of an extensive Nuclear Regulatory Commission (NRC) database of radiological sources using Microsoft Access and Excel. Reviewed the NRC database for errors and made corrections as appropriate. Provided detailed charts of the activity, age, and number of various sources of interest, which have been extremely useful in improving the utility, accuracy, and reliability of this important database.
- Experimental assistant and team member on the Carbonate Cycle for the Thermochemical Production of Hydrogen project (ORNL Seed). Assisted in making numerous changes to the experimental setup which significantly improved the experimental accuracy and the overall reliability of the data from the tests. Conducted a large fraction of the experiments.
- Key participant in a short turn-around project to assess pipeline unplugging technologies for possible application at the Fernald Environmental Management Project (FEMP) in Fernald, Ohio. Jointly responsible for the compilation, review, and assessment of various methods of unplugging pipelines, which could become plugged during waste retrieval operations at Fernald. Key duties included: traveling to Fernald for the project kick-off meeting, researching technologies and service providers, traveling to Houston to observe a demonstration of one promising technology, assisting with the development of recommendations, assisting with the documentation of the assessment, and participating in discussion of the findings with the customer.
- Research assistant to senior staff members on a DOE Advanced Fuel Cycle Initiative (AFCI) project for determining potential filtering methods for leached TRISO fuel particles.

University of Tennessee, Knoxville, TN

August 2002–May 2004

Graduate Research Assistant—University of Tennessee, Knoxville, TN, Department of Chemical Engineering

University of Tennessee, Knoxville and Oak Ridge National Laboratory, Nuclear Science and Technology Division

- Major Professor: Dr. Robert M. Counce
- Laboratory Mentor: Dr. Barry Spencer
- Fellowship funded by DOE Advanced Fuel Cycle Initiative (AFCI) fellowship program.

- Summer research supported by Higher Education Research Experiences (HERE) program at Oak Ridge National Laboratory.
- Modeled an alternative hybrid process to meet AFCI goals using fluorination and aqueous processing techniques for treatment of spent nuclear fuel using HSC Chemistry 5.0 and OLI Stream Analyzer 1.2 software packages.
- Studied selective dissolution of fluoride residue solids remaining from the fluoride volatility process.
- Developed a simple aqueous process for partitioning residue from the fluorination stage.
- Examined the separation of high-heat fission products, cesium and strontium, from fluoride residues, using simple dissolution methods based on solubility differences.

Oak Ridge National Laboratory, Oak Ridge, TN

June–August 2002

Summer Research Student—Department of Energy Office of Science Energy Research Undergraduate Laboratory Fellowship (ERULF) [now Science Undergraduate Laboratory Internships (SULI)], Oak Ridge National Laboratory, Environmental Sciences Division

- Mentors: Dr. Philip M. Jardine and Dr. Melanie A. Mayes
- Determined the effects of cation competition on sorption of Strontium and Cesium on Hanford and Ringold Formations in Hanford, WA.
- Quantified flow and transport of coupled Cs and Sr in comparison to single-species transport using batch and saturated packed column experiments with disturbed sediment.
- Utilized Atomic Absorption spectroscopy for analysis.
- Reported findings in a project report and poster presentation.
- Supported the Department of Energy project, “Fate and Transport of Radionuclides Beneath the Hanford Tank-Farms: Unraveling Coupled Processes Controlling Vadose Zone Contaminant Transport.”

June–August 2001

Summer Research Student—Department of Energy Office of Science Energy Research Undergraduate Laboratory Fellowship (ERULF) [now Science Undergraduate Laboratory Internships (SULI)], Oak Ridge National Laboratory, Environmental Sciences Division

- Mentors: Dr. Philip M. Jardine and Dr. Melanie A. Mayes
- Quantified the sorption of Cesium (Cs⁺) on each solid phase of the Upper and Lower Sands of the Upper Ringold Formation and the Plio-Pleistocene.
- Utilized batch techniques to determine isotherms for initial Cs⁺ concentrations ranging from 0–20 ppm.
- Investigated the effects of background ionic strength and background cation by performing experiments at two ionic strengths (0.02M and 0.2M) and by using two different matrices [Ca(NO₃)₂ and NaNO₃], respectively.
- Utilized Atomic Absorption spectroscopy for analysis.
- Determined the overall distribution coefficients (K_d) for Cs⁺.
- Reported findings in a project report and poster presentation.
- Supported the Department of Energy project, “Fate and Transport of Radionuclides Beneath the Hanford Tank-Farms: Unraveling Coupled Processes Controlling Vadose Zone Contaminant Transport.”

June–August 2000

Summer Research Student—Department of Energy Community College Internship (CCI), Oak Ridge National Laboratory, Environmental Sciences Division

- Mentors: Dr. Philip M. Jardine and Dr. Melanie A. Mayes
- Determined the characteristic water retention function and other general characteristics of the upper and lower sands of the Ringold Formation in the Columbia Plateau in Washington.
- Utilized an unsaturated flow method on flow cells at pressures less than 1000 cmH₂O and utilized hyperbaric pressure chambers for pressure greater than 1000 cmH₂O to determine the characteristic water retention function.
- Determined particle size distribution using the Bouyoucos Hydrometer Method.

- Calculated porosity and bulk density based on data from the undisturbed soil columns at saturation.
- Determined percent moisture by drying a known amount of soil in an oven.
- Reported findings in a project report and poster presentation.
- Supported the Department of Energy project, “Fate and Transport of Radionuclides Beneath the Hanford Tank-Farms: Unraveling Coupled Processes Controlling Vadose Zone Contaminant Transport.”

Professional Affiliations:

- American Institute of Chemical Engineers (AIChE) – Senior Member
- American Nuclear Society (ANS)
- Institute of Nuclear Materials Management (INMM)
- American Chemical Society (ACS)
- American Association for the Advancement of Science (AAAS)
- Project Management Institute (PMI)
- IEEE
- Society of Manufacturing Engineers (SME)
- Oak Ridge National Laboratory (ORNL) Committee for Women (CFW) – Secretary

Honors, Awards, and Fellowships (selected):

- Significant Event Award – 2010
- Winner of YWCA Tribute to Women 2019 Business and Industry Category
- Leadership Roane County Class of 2020

Outside Leadership and Development Activities (selected):

Brookings Executive Education Women’s Leadership Network – 2017–2018 cohort
Leadership Roane County – 2020

Volunteer and Community Involvement:

Roane County United Way Board Member – 2020 (term ends 2022 but is renewable)
Roane County United Way Community Investment Panel Member – 2021

Personal Interests and Hobbies:

Photography, travel, cooking, hiking, painting, reading, running

Reports, Publications, and Presentations: [Google Scholar (21 April 2021) citations: 78, H-index: 5, i10-index: 1]

- Authored numerous reports on nuclear nonproliferation and nuclear forensics which were not amenable to publication.

J. L. Ladd-Lively. 2021. “Uranium Signatures Testbeds (UST) Project Overview,” A presentation for the National Technical Nuclear Forensics Center Uranium Experts Panel Meeting, Virtual, March 4.

J. Ladd-Lively, D. Graff, M. Wellons, G. Rice. 2020. *NORTH ARROW II- Final Report*, X/NSSD-20-020, Oak Ridge National Laboratory, Oak Ridge, TN, October.

P. Cable-Dunlap, P. Salsman, E. Kabela, J. Birdwell, R. Jubin, J. Ladd-Lively, M. Keillor, J. Cloutier, S. Chiswell, J. Mannion, D. Hunter, N. Stevens, M. Greenhalgh. 2020. *Coordinated Signatures Investigation for Plutonium Reprocessing - FY20 Annual Report*, submitted to NNSA DNN R&D, October 13.

J. Ladd-Lively, D. Graff, M. Wellons, W. Wysor, M. Baldwin, M. Taylor, R. Kapsimalis, G. Ludtka, P. Salsman. 2020. *Annual Progress Report: FY 2019; Project: Manufacturing and Production Signatures*, ORNL/SPR-2020/1635, Oak Ridge National Laboratory, Oak Ridge, TN, September.

- P. Cable-Dunlap, J. Ladd-Lively, S. Chiswell, M. Keillor, N. Stevens. 2020. *Science Plan for CSI: Coordinated Signature Investigations*, submitted to NNSA DNN R&D, May 7.
- P. Cable-Dunlap, P. Salsman, E. Kabela, J. Birdwell, R. Jubin, J. Ladd-Lively, C. Aalseth, M. Keillor, J. Cloutier, C. Armstrong, S. Chiswell, J. Mannion, D. Hunter, N. Stevens, M. Greenhalgh, J. Price. 2019. *Coordinated Signatures Investigation for Plutonium Reprocessing - FY19 Annual Report*, X/NSSD-019-014, submitted to NNSA DNN R&D, October 17.
- J. Ladd-Lively. 2019. *ORNL Support to the Special Nuclear Material Weaponization Research & Development (SWRD) Program Review*, ORNL/LTR-2019/1218, Oak Ridge National Laboratory, Oak Ridge, TN, August.
- J. L. Ladd-Lively and G. M. Ludtka. 2018. “ORNL UEP Program Update,” A presentation for the National Technical Nuclear Forensics Center Uranium Experts Panel Meeting, Oak Ridge, TN, November 28.
- P. Cable-Dunlap, P. Salsman, E. Kabela, J. Birdwell, R. Jubin, J. Ladd-Lively, C. Aalseth, M. Keillor, J. Cloutier, C. Armstrong, S. Chiswell, J. Mannion, D. Hunter, S. Herbst, N. Stevens, M. Greenhalgh, J. Price. 2018. *Coordinated Signatures Investigation for Plutonium Reprocessing - FY18 Annual Report*, X/GSD-018-023, submitted to NNSA DNN R&D, October 9.
- J. Ladd-Lively, D. Graff, M. Wellons, G. Rice. 2018. *FY18 Annual Report: Manufacturing and Production Signatures*, X/GSD-18-019, Oak Ridge National Laboratory, Oak Ridge, TN, September.
- J. Ladd-Lively. 2018. “NORTH ARROW II campaign Briefing 90-Day Post Campaign (OR16-V-MaPS-1-PD1Ab),” Campaign Briefing to DNN R&D, June 13.
- J. L. Ladd-Lively. 2018. “Manufacturing,” Presentation at Special Nuclear Material Weaponization Research and Development (SWRD) Program Review, Los Alamos, New Mexico, May 17.
- D. Graff, J. Ladd-Lively. 2018. “NORTH ARROW II - Campaign Plan Event Dates: January 15–17, 2018,” March.
- J. Ladd-Lively, D. Graff, G. Rice, M. Baldwin, M. Wellons. 2017. “Manufacturing and Production Signatures (MaPS) Independent Project Review,” presentations to DNN R&D Independent Review Panel, December 12–13.
- B. Foy, P. Cable-Dunlap, J. Ladd-Lively, D. Starr, H. Hunter, L. Boye, J. Bollinger, M. Wellons, G. Fugate. 2017. *Detection, Location, and Characterization of a Molecular Laser Isotope Facility*, LA-CP 17-00409, submitted to NNSA DNN R&D, November.
- P. Cable-Dunlap, P. Salsman, E. Kabela, J. Birdwell, R. Jubin, J. Ladd-Lively, C. Aalseth, M. Keillor, J. Cloutier, C. Armstrong, D. Abrecht, S. Chiswell, J. Mannion, D. Hunter, N. Stevens, M. Greenhalgh, J. Price. 2017. *Coordinated Signatures Investigation for Plutonium Reprocessing - FY17 Annual Report*, X/GSD-017-035, submitted to NNSA DNN R&D, October 5.
- J. Ladd-Lively, P. Jacobson, D. Graff, M. Wellons, G. Rice. 2017. *FY17 Annual Report: Manufacturing and Production Signatures*, X/GSD-17-033, Oak Ridge National Laboratory, Oak Ridge, TN, September.
- J. Ladd-Lively, P. Jacobson, D. Graff, M. Wellons, G. Rice. 2017. *NORTH ARROW - Final Report*, X/GSD-017-034, Oak Ridge National Laboratory, Oak Ridge, TN, September.
- J. Ladd-Lively, P. Jacobson, D. Graff, M. Wellons. 2017. *COMPASS ROSE - Final Report*, X/GSD-017-017, Oak Ridge National Laboratory, Oak Ridge, TN, July.
- J. Ladd-Lively. 2017. “NORTH ARROW Campaign Briefing 90-Day Post Campaign (OR16-V-MaPS-1-PD1Ab),” Campaign Briefing to DNN R&D, May 24.

- J. Ladd-Lively. 2017. "COMPASS ROSE Campaign (OR16-V-MaPS-1-PD1Ab)," Campaign Briefing to DNN R&D, May 12.
- L. Tandon, F. Stanley, K. Fife, E. Garcia, M. Jackson, T. Jankowski, A. Lesiak, N. Pawley, F. Rocha, S. Willson, S. Yarbrow, J. McNeese, J. Birdwell, J. Holt, J. Ladd-Lively, K. Pitts, A. Casella, C. Delegard, M. Foxe, M. McCoy, M. Thompson, A. Murray. 2017. *Characterizing Pu Metal Production Activities via Novel Byproduct and Product Signatures Strategies - Final Report LA16-PD1bd-P90 Pu Metal Production Scoping Study*, Los Alamos National Laboratory, Los Alamos, NM, February 22.
- P. Jacobson, J. Ladd-Lively, M. Wellons. 2017. "NORTH ARROW - Campaign Plan Event Dates: February 13–17, 2017," February 17.
- J. Ladd-Lively. 2016. "Manufacturing and Production Signatures (MaPS) Program Plan (DEC 2016)," December 22.
- B. Foy, P. Cable-Dunlap, J. Ladd-Lively, J. Bollinger, D. Starr. 2016. *FY16 Annual Report for Molecular Laser Isotope Separation (MLIS) Project*, submitted to NNSA DNN R&D, November 1.
- D. Starr, H. Hunter, P. Cable-Dunlap, J. Ladd-Lively. 2016. *MLIS Cascade Operations Model*, submitted to NNSA DNN R&D, November.
- J. Ladd-Lively, P. Jacobson, D. Graff, M. Wellons, G. Rice. 2016. *FY16 Annual Report: Manufacturing and Production Signatures*, OR-TS/SI-16-004, Oak Ridge National Laboratory, Oak Ridge, TN, October.
- P. Cable-Dunlap, P. Salsman, E. Kabela, J. Birdwell, R. Jubin, J. Ladd-Lively, C. Aalseth, M. Keillor, J. Cloutier, C. Armstrong, D. Abrecht, S. Chiswell, J. Mannion, D. Hunter, N. Stevens, M. Greenhalgh, J. Price. 2016. *Coordinated Signatures Investigation for Plutonium Reprocessing - FY16 Annual Report*, X/GSD-016-016, submitted to NNSA DNN R&D, October 15.
- P. Jacobson, J. Ladd-Lively, M. Wellons. 2016. "COMPASS ROSE - Campaign Plan Event Dates August 8–12, 2016," September 12.
- J. L. Ladd-Lively. 2016. "Manufacturing and Production Signatures (MaPS)," Presentation at Nuclear Weaponization and Material Production Detection Review Meeting (MPD 2016), Oak Ridge, TN, August 25.
- J. L. Ladd-Lively and G. M. Ludtka. 2016. "Electron Backscattered Diffraction (EBSD) for Processing Evaluation," A presentation for the National Technical Nuclear Forensics Center Uranium Experts Panel Meeting, Oak Ridge, TN June 19.
- J. L. Ladd-Lively and G. M. Ludtka. 2016. "Machine Turning Analysis Related," A presentation for the National Technical Nuclear Forensics Center Uranium Experts Panel Meeting, Oak Ridge, TN June 19.
- J. L. Ladd-Lively and G. M. Ludtka. 2016. "ORNL UEP Program Update," A presentation for the National Technical Nuclear Forensics Center Uranium Experts Panel Meeting, Oak Ridge, TN June 19.
- J. Ladd-Lively. 2016. "Manufacturing and Production Signatures (MaPS) Program Plan (May 2016)," May 17.
- P. Jacobson, J. Ladd-Lively, M. Wellons, J. Kolkmeier. 2015. "Installation Plan – December 2015," December 10.
- P. Cable-Dunlap, P. Salsman, E. Kabela, R. Jubin, J. Birdwell, J. Ladd-Lively, D. Duckworth, M. Engelmann, J. Cloutier, C. Aalseth, H. Chien, S. Chiswell, M.D. Cheng, D. Hunter, S. Walter. 2015. *Small-Scale Reprocessing Venture Annual Report For FY15*, X/GSD-15-016, submitted to NNSA DNN R&D, September 30.

- D. Duckworth, C. Aalseth, J. Cloutier, P. Cable-Dunlap, J. Birdwell, R. Jubin, J. Ladd-Lively, S. Chiswell, D. Hunter, H. Chien, S. Bakhtiari, M. Cheng. 2014. *Small-Scale Reprocessing Venture Summary Report*, PNNL-NSD-3890, November 24.
- J. L. Ladd-Lively. 2014. “Oak Ridge National Laboratory Overview,” presentation at NTNFC annual program review, Argonne, IL, August 4–7.
- J. L. Ladd-Lively. 2014. “Feasibility Study on the Use of On-line Multivariate Statistical Process Control for Safeguards Applications in Natural Uranium Conversion Plants,” paper and presentation at 55th Annual Meeting of the Institute of Nuclear Materials Management (INMM), Atlanta, GA, July 20–24.
- R. D. Hunt, R. R. Hickman, J. L. Ladd-Lively, K. K. Anderson, R. T. Collins, J. L. Collins. 2014. “Production of small uranium dioxide microspheres for cermet nuclear fuel using the internal gelation process,” *Annals of Nuclear Energy* **69**, July, pp. 139–143.
- P. Cable-Dunlap, R. Jubin, J. Ladd-Lively. 2014. “ORNL Strategy for DNN R&D Small Scale Reprocessing Venture,” February 19, 2014.
- J. L. Ladd-Lively. 2013. “Development of a Monitoring Framework for the Detection of Diversion of Intermediate Products in a Generic Natural Uranium Conversion Plant,” Ph.D. Dissertation, University of Tennessee, Knoxville, December. Available at http://trace.tennessee.edu/utk_graddiss/2586/.
- B. B. Spencer, J. F. Birdwell, Jr., D. R. Brashear, G. D. Del Cul, R. D. Hunt, J. L. Ladd-Lively, D. F. Williams. 2013. *Process Off-gas Components Associated with Reduction of UF₆ to UF₄*, X/GSD13-009, Oak Ridge National Laboratory, Oak Ridge, TN, June 14.
- B. B. Spencer, J. F. Birdwell, Jr., D. R. Brashear, G. D. Del Cul, R. D. Hunt, J. L. Ladd-Lively, D. F. Williams. 2012. *Development of Downstream Signatures associated with Reduction of UF₄ to Metal*, X/ISP12-004, Oak Ridge National Laboratory, Oak Ridge, TN, July 23.
- D. L. Lee, J. Ladd-Lively, E. B. Rauch, J. A. Chapman, and S. Dewji. 2011. “Using the Uranyl Nitrate Calibration Loop Equipment (UNCLE) at ORNL for Safeguards Instrumentation,” paper and presentation at American Nuclear Society Winter Meeting, Washington D.C., October 30–November 3.
- B. B. Spencer, J. F. Birdwell, Jr., G. D. Del Cul, R. D. Hunt, J. L. Ladd-Lively, D. F. Williams. 2011. *Production and Analysis of Pedigreed UF₄ for Development of Signatures for Alternative Uranium Processes*, X/GSD11-16, Oak Ridge National Laboratory, Oak Ridge, TN, October 7.
- P. R. Nuessle, R. Brunson, D. R. Radford, C. W. Alexander, J. L. Ladd-Lively, S. B. Carlisle, A. Souders, E. A. Walker, R. T. Jubin, H. A. Brant, D. B. Hunter, J. R. Cadieux, R. J. Vedder, P. Bailey, J. J. DeGange, R. Achey, S. R. Walter, E. D. Kabela, T. B. Brown, M. Summer, P. W. Bowman, P. R. Cable-Dunlap, L. Felker. 2011. *Nuclear Fuel Cycle Signatures Project - Combined Final Report*, submitted to NNSA DNN R&D, September 30.
- D. Lee, J. Ladd-Lively, C. W. Chase Jr., E. Rauch, J. Chapman, and S. Dewji. 2011. *Uranyl Nitrate Calibration Loop Equipment (UNCLE) 2011 Annual Report*, ORNL/TM-2011/498, Oak Ridge National Laboratory, Oak Ridge, TN, September.
- D. Lee, J. Ladd-Lively, C. W. Chase Jr., J. Chapman, S. Dewji, and E. B. Rauch. 2011. “Status Update: Calibration of Safeguards Monitors using the Uranyl Nitrate Calibration Loop Equipment (UNCLE) at ORNL,” paper and presentation at 52nd Annual Meeting of the Institute of Nuclear Materials Management (INMM), Palm Desert, CA, July 17–22.

- J. L. Ladd-Lively, D. Schuh, D. S. Bracken, E. B. Rauch, and J. D. West. 2010. “Calibration of Safeguards Monitors Using the Uranyl Nitrate Calibration Loop Equipment (UNCLE) at ORNL,” paper and presentation at 51th Annual Meeting of the Institute of Nuclear Materials Management (INMM), Baltimore, MD, July 11–16.
- L. Borg, S. Niemeyer, B. Bowers, B. Broadhead, D. Chamberlain, L. Gray, M. Goldberg, B. Jubin, J. Krebs, M. Kristo, J. Ladd-Lively, D. McKnight, B. Patton, C. Pereira, D. Starr, J. Vandersall, F. Wong. 2010. *Simulating Signatures in Nuclear Materials: Feasibility for Developing Signatures Capabilities for the Uranium-Fuel Cycle*, ORNL/TM-2008/195, LLNL-TR-428104, Sponsored by the National Technical Nuclear Forensics Center, March.
- A. Raffo-Caiado, J. M. Begovich, J. J. Ferrada, J. L. Ladd-Lively, M. A. S. Marzo, L. C. Palhares, F. C. Diaz, and M. S. Grund. 2009. *Model of a Generic Natural Uranium Conversion Plant—Suggested Measures to Strengthen International Safeguards*, ORNL/TM-2008/195, Oak Ridge National Laboratory, Oak Ridge, TN, November.
- J. L. Ladd-Lively, W. J. Bicha, L. G. Loden, G. D. Del Cul, B. D. Patton. 2009. *Review of Downstream Processes and Recommendations for Preparation and Analysis of Representative Materials*, OR-TS/SI-09-028, Oak Ridge National Laboratory, Oak Ridge, TN, November.
- J. L. Ladd-Lively. 2009. “Safeguards and Nonproliferation for Uranium Processes,” presentation to Advisory Committee, Oak Ridge, TN, October 5.
- J. L. Ladd-Lively. 2009. “Production of Representative Uranium Material,” presentation at NA-22 U-235 Production Detection Program Review, Oak Ridge, TN, September 16.
- J. L. Ladd-Lively. 2009. “Status Update: Uranyl Nitrate Calibration Loop Equipment (UNCLE) at ORNL,” paper and presentation at 50th Annual Meeting of the Institute of Nuclear Materials Management (INMM), Tucson, AZ, July 12–17.
- J. L. Ladd-Lively. 2009. “Fuel Cycle Signatures: Operations and Equipment for CETE Demo,” presentation at the NA-22 Signatures and Observables Program Review, Cocoa Beach, FL, May 27.
- J. L. Ladd-Lively and S. N. Storch. 2009. *Gap Analysis of Signatures and Observables Associated with Laser Isotope Separation Technologies for Uranium Enrichment*, Oak Ridge National Laboratory, Oak Ridge, TN, April 30.
- J. L. Ladd-Lively. 2009. “Preparation of Fully Pedigreed Prototypic Uranium Material for Development of Predictive Signatures for Uranium Processing,” DHS Update presentation, April 24.
- C. W. Forsberg, J. L. Collins, L. R. Dole, J. J. Ferrada, M. J. Haire, R. D. Hunt, J. L. Ladd-Lively, B. E. Lewis, Jr., and R. Wymer. 2009. “A Uranium Thermochemical Cycle for Hydrogen Production,” presentation and paper at Fourth Nuclear Energy Agency Exchange Meeting on Nuclear Production of Hydrogen, Oak Brook, IL, April 13–16.
- J. J. Ferrada, J. L. Collins, L. R. Dole, C. W. Forsberg, M. J. Haire, R. D. Hunt, B. E. Lewis, Jr., R. Wymer, and J. L. Ladd-Lively. 2009. “Carbonate Thermochemical Cycle for the Production of Hydrogen,” poster presentation and paper at National Hydrogen Association Conference and Hydrogen Expo, Columbia, SC, March 30.
- P. R. Nuessle, E. Walker, D. Radford, A. Souders, C. W. Alexander, D. B. Hunter, J. R. Cadieux, P. Bowman, S. Walter, J. DeGange, K. Huffman, M. Parker, T. Brown, P. Cable-Dunlap, R. Brunson, and J. L. Ladd-Lively. 2009. “Nuclear Signature Collections from the CETE Demonstration,” presentation at Spring 2009 American Chemical Society National Meeting, Salt Lake City, UT, March 22–26.

- J. L. Ladd-Lively. 2009. "Fuel Cycle Signatures: Current Status, Schedule, and Path Forward," presentation to independent review committee for NA-22, March 4.
- J. L. Ladd-Lively. 2008. *Uranyl Nitrate Flow Loop*, ORNL/TM-2008/048, Oak Ridge National Laboratory, Oak Ridge, TN, October.
- R. Clemmer, E. Collins, J. Di Benedetto, H. Dion, F. Pabian, J. Henderson, A. Icenhour, J. Ladd-Lively, L. Nichols, D. Parks, P. Nuessle, D. Pennington, L. Pitts, P. Rexroth, J. Sanders, W. Strunk, S. Turner, R. Wallace. 2008. *Uranium-235 Production Detection Program Technology Roadmap*. September.
- R. Clemmer, E. Collins, J. Di Benedetto, H. Dion, F. Pabian, J. Henderson, A. Icenhour, J. Ladd-Lively, L. Nichols, D. Parks, P. Nuessle, D. Pennington, L. Pitts, P. Rexroth, J. Sanders, W. Strunk, S. Turner, R. Wallace. 2008. *Annex of Methods for the Uranium-235 Production Detection Program Technology Roadmap*. September.
- J. L. Ladd-Lively. 2008. "Status Update: Uranyl Nitrate Calibration Loop Equipment (UNCLE) at ORNL," paper and presentation at the 49th Annual Meeting of the Institute of Nuclear Materials Management (INMM), Nashville, TN, July 13–17.
- J. L. Ladd-Lively, B. D. Patton, and B. E Lewis, Jr. 2008. *Preparation of Fully Pedigreed Prototypic Uranium Material for Development of Predictive Signatures for Uranium Processing*, ORNL/TM-2008/063, Oak Ridge National Laboratory, Oak Ridge, TN, May.
- J. L. Ladd-Lively, W. D. Strunk, and A. S. Icenhour. 2008. *Estimation of Leak Rate*, X/GID-08-004, Oak Ridge National Laboratory, Oak Ridge, TN, March.
- J. L. Ladd-Lively, B. D. Patton, B. E Lewis. 2008. "Preparation of Fully Pedigreed Prototypic Uranium Material for Development of Predictive Signatures for Uranium Processing," presentation at DNDO/NTNF Pre-Detonation Materials Capability Development Program Review, Arlington, VA, February 27.
- J. J. Ferrada, L. R. Dole, C. W. Forsberg, M. J. Haire, R. D. Hunt, B. E Lewis, Jr., R. Wymer, and J. L. Ladd-Lively. 2008. "S06-052: Carbonate Thermochemical Cycle for the Production of Hydrogen," LDRD report, Oak Ridge National Laboratory, Oak Ridge, TN, February.
- L. R. Dole, J. J. Ferrada, C. W. Forsberg, M. J. Haire, R. D. Hunt, B. E Lewis, Jr., J. L. Collins, R. Wymer, and J. L. Ladd-Lively. 2007. "Carbonate Thermochemical Cycle for the Production of Hydrogen," presentation to ORNL Seed Committee, Oak Ridge National Laboratory, Oak Ridge, TN, November.
- J. J. Ferrada, J. Collins, L. R. Dole, C. W. Forsberg, M. J. Haire, R. D. Hunt, B. E Lewis, Jr., R. Wymer, and J. L. Ladd-Lively. 2007. "418: Carbonate Thermochemical Cycle for the Production of Hydrogen," LDRD report, Oak Ridge National Laboratory, Oak Ridge, TN, October.
- W. D. Strunk, J. L. Ladd-Lively, D. F. Starr, J. Kreykes, A. Droege. 2007. *Uranium Conversion, Yellowcake to UF₆: Signatures and Observables*, FY2007 Mission Area Requested Study for the Office of Nonproliferation Research and Development (NA-22) Office of Proliferation Detection (NA-221) Signatures and Observables Program, August.
- J. L. Ladd-Lively. 2007. "Uranyl Nitrate Flow Loop," presentation to foreign visitors as part of a safeguards demonstration workshop, Oak Ridge, TN, July 16.
- J. L. Ladd-Lively. 2007. "Development of the Uranyl Nitrate Calibration Loop Equipment (UNCLE) at ORNL," paper and presentation at the 48th Annual Meeting of the Institute of Nuclear Materials Management (INMM), Tucson, AZ, July 8–12.

J. J. Ferrada, J. Collins, L. R. Dole, C. W. Forsberg, M. J. Haire, R. D. Hunt, B. E. Lewis, Jr., R. Wymer, and J. L. Ladd-Lively. 2006. "S06-052: Carbonate Thermochemical Cycle for the Production of Hydrogen," LDRD report, Oak Ridge National Laboratory, Oak Ridge, TN, October.

J. L. Ladd-Lively. 2006. *Survey of Significant Historical Releases of Nuclear Material*, ORNL/TM-2005/153, Oak Ridge National Laboratory, Oak Ridge, TN.

J. L. Ladd-Lively, J. Begovich, M. M. Pickrell, J. West, D. Langner, W. O'Connor, and C. Annese. 2006. "Measurement of Uranium Throughput in a Natural Uranium Conversion Plant," presentation during IAEA site visit, Preston, United Kingdom, March 22–23.

J. L. Ladd-Lively. 2006. "Safeguards Application of Flowmeters in Natural Uranium Conversion Plants," paper and presentation at the 47th Annual Meeting of the Institute of Nuclear Materials Management (INMM), Nashville, TN, July 16–20.

M. I. Morris, J. L. Ladd-Lively, and B. E. Lewis. 2004. *Pipeline Unplugging Assessment and Recommendations for the Fernald Environmental Management Project*, R04-121782, Oak Ridge National Laboratory, Oak Ridge, TN, June 18. Available at <http://www.ornl.gov/~webworks/cppr/y2004/rpt/121782.pdf>.

J. L. Ladd-Lively. 2004. "Separation of Fluoride Residue Arising from Fluoride Volatility Recovery of Uranium from Spent Nuclear Fuel," Master of Science Thesis, University of Tennessee, Knoxville, TN, May. Available at http://trace.tennessee.edu/utk_gradthes/2557/.

J. L. Ladd-Lively, B. B. Spencer, and R. M. Counce. 2003. "Separation of Cs/Sr from Residues Arising from Fluoride Volatility Processing of Spent Nuclear Fuel," poster presentation and paper at the Thirteenth Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN, October 27–30.

J. L. Ladd-Lively. 2003. "Status Report: Conceptual Flow Sheet for Separation of Residues Arising from Fluoride Volatility Processing of Spent Nuclear Fuel," poster presentation at the AFCI Semi-Annual Meeting, Santa Fe, NM, August 26–28.

J. L. Ladd. 2003. "Overview of Current Research: Separation of Residual Fluorinated Slag Containing Transuranium (TRU) and Fission Products," poster presentation at the AFCI Semi-Annual Meeting, Albuquerque, NM, January 22–24.

M. A. Mayes, P. M. Jardine, T. L. Mehlhorn, B. N. Bjornstad, J. L. Ladd, and J. M. Zachara. 2003. "Transport of Multiple Tracers in Variably Saturated Humid Region Structured Soils and Semi-Arid Region Laminated Sediments," *Journal of Hydrology*, **275** (3-4): 141–161.

M. N. Pace, M. A. Mayes, P. M. Jardine, S. E. Fendorf, T. L. Mehlhorn, Y. Roh, X. Yin, J. L. Ladd, J. T. Teerlink, and J. M. Zachara. 2003. "Contaminant Transport through Subsurface Material from the DOE Hanford Reservation, Richland, WA," paper and presentation at the American Chemical Society Meeting, New Orleans, LA, March 25–28.

J. L. Ladd. 2002. "The Effects of Cation Competition on Sorption of Sr and Cs on Hanford and Ringold Formations, Hanford, WA," poster session for the summer research participants, Oak Ridge National Laboratory, Oak Ridge, TN, August 7.

M. N. Pace, P. M. Jardine, M. A. Mayes, T. L. Mehlhorn, J. L. Ladd, J. Teerlink, and J. M. Zachara. 2002. "Strontium and Uranium Transport through Variable Saturated Undisturbed Cores from the Hanford Formation, Richland, WA," paper and presentation at the Soil Science of America Annual Meeting, Indianapolis, IN, November 10–14.

J. L. Ladd. 2001. "Sorption of Cesium on the Upper and Lower Sands of the Upper Ringold Formation and the Plio-Pleistocene," poster session for the summer research participants, Oak Ridge National Laboratory, Oak Ridge, TN, August 10.

M. A. Mayes, P. M. Jardine, M. N. Pace, S. E. Fendorf, T. L. Mehlhorn, Y. Roh, J. L. Ladd, and B. N. Bjornstad. 2001. "Hydrologic Processes Governing the Transport of Radionuclides through the Hanford Vadose Zone," *Transactions—American Geophysical Union* **82**(47), Fall Meet. Suppl., Abstract H52C-0429, San Francisco, CA, December 10–14.

M. A. Mayes, P. M. Jardine, T. L. Mehlhorn, M. N. Pace, Y. Roh, J. L. Ladd, and B. N. Bjornstad. 2001. "Hydrologic Processes Controlling the Transport of Radionuclides through the Hanford Vadose Zone," paper and presentation at the Soil Science of America Annual Meeting, Charlotte, NC, October 21–25.

M. N. Pace, P. M. Jardine, M. A. Mayes, T. L. Mehlhorn, Y. Roh, J. L. Ladd, and J. M. Zachara. 2001. "Unsaturated Contaminant Transport in Undisturbed Cores from the Hanford Formation, Richland, WA," paper and presentation at the Soil Science of America Annual Meeting, Charlotte, NC, October 21–25.

J. L. Ladd. 2000. "Water Retention Characterization and Other General Characterizations of the Upper and Lower Sands of the Ringold Formation," poster session for the summer research participants, Oak Ridge National Laboratory, Oak Ridge, TN, August 11.

M. A. Mayes, P. M. Jardine, T. L. Mehlhorn, B. N. Bjornstad, and J. L. Ladd. 2000. "Solute Displacement through Variably Saturated Laminated Silts and Sands," paper and presentation at the Geological Society of America, Reno, NV, November 13–16.