Rosemary A. Montgomery, PE
Acting Group Leader and Senior R&D Staff Member

Facilitating cross-cutting collaborations to enhance ORNL's science culture and produce world-leading R&D

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Career milestones

- R&D 100 Award
- DOE Secretary's Honor Award
- Successful ,ongoing collaborations across divisions, directorates, and laboratories to achieve high quality irradiated fuel examinations
- CASL Focus Area Lead Technology Deployment & Outreach
- TVA Fleet fuel mechanical design/performance responsibility
- Primary author, CASL Phase 2 proposal
- Pivotal role in creating DOE's accident-tolerant fuel program through input to the Advanced Fuel Program

Work Experience

Acting Group Leader, Used Fuel Systems (2019 to present) and Sr. Research Staff, Oak Ridge National Laboratory (2016 to present)

Specifies and implements nondestructive and destructive examinations of spent nuclear fuel for the safe storage and transport of used commercial nuclear fuel.

Develops novel methods and applications for used fuel examinations.

Compiles and synthesizes acquired test data.

Collaborates across the laboratory to advance the current understanding of nuclear fuel behavior.

Develops new and alternative processes to facilitate collaboration across multiple ORNL facilities.

Provides staff planning, development, and oversight; team strategic planning; and internal and external collaborative partnership development.

Sr. Program Manager, Tennessee Valley Authority (2009 to 2016)

Conducted technical reviews of proposed mechanical fuel design changes and related operational impacts, oversaw fabrication of nuclear fuel used at TVA reactors.

Served on industry teams and initiatives for fuel reliability (EPRI, INPO, Affinity, etc.) and conducted TVA training on fuel performance topics.

Served as TVA principle investigator for DOE's Consortium for Advanced Simulation of LWRs (CASL).

Chaired the Industry Advisory Committee to INL on advanced fuel research topics.

Career milestones

- Formally trained in staff supervision
- Collaboration on strategic planning activities
- Development or regulatory submittals for US fuel fleet and customer interface on fuel performance
- Framatome's US lead for fuel post-irradiation examinations
- Successful sole proprietorship for 8 years providing expertise in packaging design
- Design and regulatory interfaces on fresh fuel, low- and high-level waste packages
- Evolved personal understanding of nuclear fuel design and its effect on plant operation

Work Experience

AREVA NP Inc. (2005 to 2009)

Supervised Fuel Mechanics/Dynamics, providing planning, staffing, and oversight of the team supporting dynamic fuel response, including seismic, LOCA, and FIV; specified assembly and component testing; developed staff qualifications matrix and procedures for workflow.

As Principal Engineer, Fuel Mechanical & Structural Design, performed fuel rod mechanical analyses, fuel assembly structural analyses, assembly testing and evaluation, and developed and tested shipping containers.

As US Post-Irradiation Examination Coordinator, specified PIE for customer plants, coordinated exam planning and execution, evaluated data, and developed associated reports. Recommended development of new or improved poolside PIE techniques.

Consultant, Montgomery Engineering & Technical Services (1997 to 2005)

Performed packaging design, evaluation, testing, and SARP preparation for all types of radioactive materials, including fresh fuel assemblies, MOX, UF_6, spent fuel (onsite storage, transfer and transport), UO_2 powder and pellets, liquid uranyl nitrate, and low-level and high-level wastes.

Project Engineer, Chem-Nuclear Systems (1995 to 1997)

Conducted thermal design and evaluation of DOE's MPC storage and transfer cask, radiation shielding analyses, structural and thermal evaluations for CNS packaging; supported waste disposal analyses.

Product Design Technician, Westinghouse Commercial Nuclear Fuels (1989 to 1993)

Prepared test and product specifications and performed CAD and drafting, and supported data reduction and statistical evaluations of the results of mechanical, hydraulic and DNB testing. Developed code and supported thermal/hydraulics efforts for design engineering staff.

Education / Qualifications

- BS, Mechanical Engineering, University of South Carolina, 1995
- Licensed Professional Engineer, Mechanical, State of Tennessee (106908)
- DOE Q Clearance

Selected Publications

1. EPRI panel member, *Phenomena Identification and Ranking Table (PIRT) Exercise for Used Fuel Cladding Performance* (3002018439), June 2020.
2. R. Montgomery, Robert N. Morris, "Measurement and Modeling of the Gas Permeability of High Burnup Pressurized Water Reactor Fuel Rods, *Journal of Nuclear Materials*, Vol. 523, 2019, pp. 206–215, ISSN 0022-3115, https://doi.org/10.1016/j.jnucmat.2019.05.041.
3. R. Montgomery, R. Morris, B. Bevard, and J. Scaglione, "Key Results from Detailed Nondestructive Examinations of 25 Pressurized Water Reactor High Burnup Spent Nuclear Fuel Rods," *Nuclear Science and Engineering*, 2019, DOI: 10.1080/00295639.2019.1573602.
4. R. Montgomery, "Non-Destructive Pressure Measurement Technique for Irradiated Nuclear Fuel Rods, TopFuel Water Reactor Fuel Conference," Prague Czech Republic, September 2018.
5. R. Montgomery et al., *Sister Rod Nondestructive Examination Final Report*, ORNL/SPR-2018/801, 2018.
6. R. Montgomery, R. Morris, B. Bevard, and J. Scaglione. "Gamma Scanning of 25 PWR Spent Fuel Rods in the High Burnup Spent Fuel Data Project," ANS Winter Meeting and Technology Expo, November 2017.
7. R. Montgomery, J. Scaglione, B. Williamson, and B. Wakeman. "Experience with Used Nuclear Fuel Reimmersion for Repackaging after Three Years in Dry Storage," ANS Winter Meeting and Technology Expo, November 2017.
8. R. Montgomery, "Enhanced Accident Tolerant LWR Fuels: Metrics Development," *Proceedings of the American Nuclear Society Top Fuel Conference*, September 2013.
9. R. Montgomery, "Industry-Valued Design Objectives for Advanced LWR Fuels and Concept Screening Results," *Proceedings of the American Nuclear Society Top Fuel Conference*, September 2013.
10. R. Montgomery, "M5® Cladding Behavior with Zinc Injection: Results Obtained at Sequoyah-2," International Conference on Water Chemistry of Nuclear Reactor Systems, September 17, 2008, Berlin.

ORNL Inventions

- Advanced Diagnostics and Evaluation Platform 2.0 (ADEPT 2.0)
- Tube Acoustic-based Pressure and Stress (TAPS) Measurement System (provisional patent)
- Spent Fuel Rod Heat Treatment Oven (SFRHTO)
- An Ultrasonic Waveguide for Improved Ultrasonic Thermometry (provisional patent filed)
- System for Aerosol Sampling during Tensile and Bending Tests on a Universal Test Machine (provisional patent to be filed)

Synergistic Activities

- President, Women in Nuclear Science and Global Security, 2020
- Working group chair, American Nuclear Society Standard 57.5, Light Water Reactors Fuel Assembly Mechanical Design and Evaluation
- Expert panelist, EPRI LWR cladding performance
- Subcommittee member, EPRI Extended Storage Collaboration Program, Fuel Assembly
- Founding member, CASL VERA User's Group
- Chair, Industry Advisory Committee to INL Advanced Light Water Reactor Fuel Development Program, 2011 – 2016