

Richard H. Howard
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PROFESSIONAL EXPERIENCE

Irradiation Engineer, Oak Ridge National Laboratory, Oak Ridge, TN

2011 – Present

Develop irradiation experiments for various isotopes, fuels, and materials research and development programs. This work includes the performing/overseeing the experiment design (thermal, structural, neutronic, safety basis analyses, etc.), project management (budgeting, fabrication and assembly oversight), and producing/maintaining fabrication documentation to ensure quality assurance and control for the experiment design and assembly processes. Notable projects include:

- Supporting multiple projects supporting Accident Tolerant Fuels (FeCrAl and Mo cladding development) research a consortium of institutions including the Oak Ridge National Laboratory (ORNL), Idaho National Laboratory (INL), Electrical Power Research Institute (EPRI), and Los Alamos National Laboratory (LANL)
- ²³⁸Pu isotope production target development at ORNL and the INL
- ⁶⁰Co isotope production capsule development at the INL
- Irradiation of Inconel X-750 to support helium production in CANDU garter springs; work sponsored by the Ontario Power Group, CANDU Owners Group, Bruce Power, and the Canadian Nuclear Laboratories

Other responsibilities include providing technical expertise and support for various experiment development efforts, create and expand existing technical resources for ORNL or customers to support new research needs, and lab space management that facilitates a broad spectrum of research and development.

- Development of a hot cell facility to encapsulate pre-irradiated samples in irradiation capsule
- Deploy a capsule production facility at ORNL to meet the national demands for High Specific Activity (HSA) ⁶⁰Co (meeting schedule requirements while remaining under budget)

Research Assistant, North Carolina State University, Raleigh, NC

2009 – 2011

Explored the GE-14 BWR fuel assembly, specifically the part-length rod configuration, to simplify the geometry of the bundle and improve the thermal output, core design, and efficiency.

Undergraduate Research Assistant, Auburn University, Auburn, AL

2008 – 2009

Developed experimental facility to understand loading failures in high-power electrical connectors for hybrid vehicles.

EDUCATION

*Master of Nuclear Engineering - Minor in Mathematics
North Carolina State University, Raleigh, NC*

2009 – 2012

Developed core simulation codes of PWR/BWR systems to model and enhance performance. Focus was on computational thermal-hydraulic behavior and neutron transport models that employed both deterministic and stochastic (Monte Carlo) analysis techniques.

*Bachelor of Mechanical Engineering
Auburn University, Auburn, AL*

2006 - 2009

Acquired the knowledge and practice of engineering science and technology, specifically with mechanical systems. Applied principles, techniques, and equipment to design a solar panel deployment system for the “SOL of Auburn” solar car for thesis work.

PROFESSIONAL AFFILIATIONS

- FE/EIT Certification, 2011
- American Nuclear Society (ANS), 2011
- American Society of Mechanical Engineers (ASME), 2006

AWARDS AND ACADEMIC HONORS

- UT-Battelle Awards Night 2013 – Engineering Research and Development
- UT-Battelle 2012 Significant Event Award, ‘Irradiation of single pellet targets to support the Pu-238 supply project’
- Tau Beta Pi Engineering Honor Society
- Pi Tau Sigma Mechanical Engineering Honor Society
- Graduated *Cum Laude* from Auburn University

SKILLS

Computer languages and applications

LINUX, FORTRAN, MATLAB, PYTHON, LabVIEW, Mathcad, ANSYS, Solid Edge (CAD), SCALE (neutronics simulation), COBRA-EN (thermal-hydraulics simulation), MS OSs and MS Office

Technical

Specialized in mechanical design, thermal-hydraulics, along with a neutron transport modeling using modern computational techniques. Strong background finite element methods, material mechanics, control theory with application to dynamic systems, vibration analysis, machine design and friction/wear analysis. Competent analyst and designer with strong ability to systematically and efficiently find solutions for a diverse set of engineering problems.

Personal

Held many positions in all levels of team environments from leadership to team member roles. Strong communication skills (both verbal and written), along with good management skills that result in effective time and resource management.

SELECT PUBLICATIONS

- **Howard, R. H.**, Schnitzler, B., Sprenger, M., Soderquist, L., “Irradiation Capsule Design to Support DOE Resumption of US Co-60 Isotope Production,” Proc. 2014 International Group of Research Reactors (IGORR 2014), Bariloche, AR., November 17-21, 2014
- Ott, L. J., **Howard, R. H.**, Howard, R. L., McDuffee, J. L., and Yan, Y., “Preparation of Prototypic Irradiated Hydrided-Zircaloy Cladding for UFDC Programs,” Proc. LWR Fuel Performance Meeting/Top Fuel 2013, Charlotte, North Carolina., September 15-19, 2013.
- **Howard, R. H.**, McDuffee, J. L., and Katoh, Y., “Graphite Compressive Creep Capsule Design for Irradiation in the HFIR,” Proc. 2013 American Nuclear Society Annual Meeting, Atlanta, Ga., June 16-20, 2013.
- **Howard, R. H.**, Yan, Y., Howard, R. L., McDuffee, J. L., and Ott, L. J., “Production of Simulated High-Burnup Used Fuel Cladding in the HFIR,” Proc. 2013 International High-Level Radioactive Waste Management (2013 IHLWRM), Albuquerque, N. Mex., April 28-May 2, 2013.
- **Howard, R. H.**, McDuffee, J. L., Fechter M. A., and Katoh, Y., "Development of HFIR Target Experiment for Graphite Irradiation Creep," Proc. 12th International Graphite Specialist Meeting (INGSM-13), Meitingen, Germany, September 23-26, 2012.