

PDRA Opportunity at UIUC to Support INL ATF Development

Introduction: LWR accident tolerant fuel work at the University of Illinois (UIUC) has been ongoing for approximately six years (<https://neup.inl.gov/SiteAssets/Final%20%20Reports/FY%202012/12-4728%20NEUP%20Final%20Report.pdf>). This past work focused on coatings using a dedicated magnetron sputtering system, a dedicated simultaneous thermogravimetric analyzer to quantify weight gain under high temperature steam, and used several advanced microanalytical analysis techniques at the UIUC MRL (<https://mrl.illinois.edu/>). The next phase of our effort in this area will involve chromium coatings deposited at elevated temperature on Zr-based cladding tubing, mechanical property measurements, steam exposure, INL TREAT experiments, and microanalytical analysis. The project will involve R/D work to determine optimized Cr coatings for ATF applications both under normal operation and under transient conditions. The two-year project is supported by the FCRD-AFC via INL funding. Further information regarding the UIUC work scope will be provided upon request.

PDRA qualifications: The ideal candidate will have the following qualifications:

- Knowledge of basic and advanced metallurgy including phase behavior and phase diagrams, microstructure characteristics, kinetics, diffusion, crystal lattice structure, crystal lattice defect structure, and mechanical properties.
- Knowledge of nuclear materials, with an emphasis on cladding, including corrosion/oxidation in LWR environments and radiation damage processes active in metals and alloys.
- Experience with PVD techniques, especially magnetron sputtering.
- Experience with advanced microanalytical analysis techniques such as TEM, (S)TEM-EDS, XPS, AES, SEM, XRD, and EBSD.
- The ability to communicate effectively, both verbally and via technical writing.
- The ability to work independently, in a group setting, and possibly mentor junior graduate students.

The start date for this project is September 1, 2019, but is negotiable. The period of performance is one year, with a second year likely assuming sufficient progress. Applicants should send a cover letter describing relevant experience, an updated CV, and the contact information of three references via email.

Contact information:

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