Nuclear Fuel Cycle Technologies

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National Need and INL Focus Areas
- Development of advanced aqueous or pyrochemical separation technologies for used nuclear fuel recycling
- Development of offgas capture technologies for iodine, krypton, xenon, and/or ruthenium removal from recycling offgas streams
- Radiation chemistry of advanced recycling processes
- Dynamic process modeling of separation systems to support used nuclear fuel recycling

Potential University Collaboration Areas
- Minor actinide separation from lanthanides
- Modeling and simulation of separation processes
  - Aqueous solvent extraction
  - Electrochemical separation
- Radiation chemistry of solvent extraction ligands and processes
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Potential Funding Sources

- NEUP has most potential for funding
  - FC-1.1: Electrochemical separations
  - FC-1.2: Material Recovery, solvent extraction chemistry and radiation chemistry
  - FC-1.3a: Offgas Separation
  - MS-FC-1: Mission Supporting Fuel Cycle R&D
  - RC-3: Experimental investigation of radioisotope retention capability of liquid metal coolants (sodium and lead).
    - Radionuclide interactions with the coolant (compounds formed, solubility, etc.)
    - Radionuclide behavior within the coolant (mixing, surface effects, plate-out, etc.)
    - Vaporization of radionuclides from the coolant
    - The transport of radionuclide gas/vapor bubbles through the coolant

- Other Funding Source Ideas???

Potential Outcomes

- Consider NEUP proposals, partnering with INL researchers