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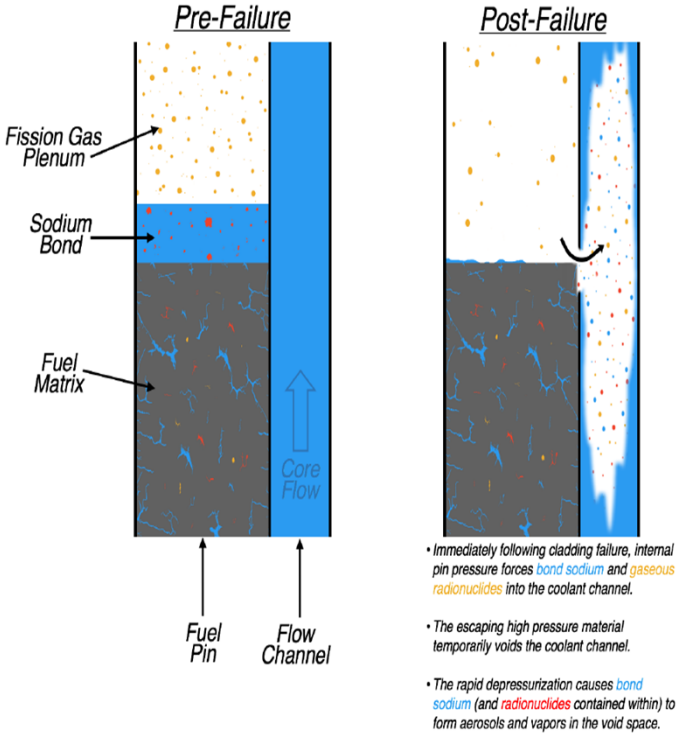
Experimental Measurements of Fission Product Retention in Liquid Sodium

Background

- Liquid metal fast breeder reactors are leading candidates for the next phase of commercial nuclear reactor deployment
- To license and operate a commercial nuclear power plant, it is vital to ensure its safe operation
  - Set out to fulfill a knowledge gap in the understanding of radioisotope retention in liquid metal coolants



D. Grabaskas, M. Bucknor, and J. Jerden, "Regulatory Technology Development Plan - Sodium Fast Reactor: Mechanistic Source Term Development - Metal Fuel Radionuclide Release," ANL-ART-49, 2016.

Objectives

- Conduct a series of experiments to obtain high fidelity data on radionuclide retention in liquid sodium for gases, aerosols, and solid particles
  - Utilize X-Ray imaging, sodium pool sampling, and gas mass spectroscopy
- Perform comparisons between experimental data and results obtained from computational tools