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## A Mechanistic Source Term Calculation for a Metal Fuel Sodium Fast Reactor

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A mechanistic source term (MST) calculation attempts to realistically assess the transport and release of radionuclides from a reactor system to the environment during a specific accident sequence. The U.S. Nuclear Regulatory Commission (NRC) has repeatedly stated its expectation that advanced reactor vendors will utilize an MST during the U.S. reactor licensing process. As part of a project to examine possible impediments to sodium fast reactor (SFR) licensing in the U.S., an analysis was conducted regarding the current capabilities to perform an MST for a metal fuel SFR. The purpose of the project was to identify and prioritize any gaps in current computational tools, and the associated database, for the accurate assessment of an MST. The results of the study demonstrate that an SFR MST is possible with current tools and data, but several gaps exist that may lead to possibly unacceptable levels of uncertainty.

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