



U.S. DEPARTMENT OF
ENERGY

Nuclear Energy

Systems Analysis and Integration Campaign

FY 2019 CINR Webinar

Interface Tools for Transmutation Data Library

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August 2018

SA&I Campaign Objectives

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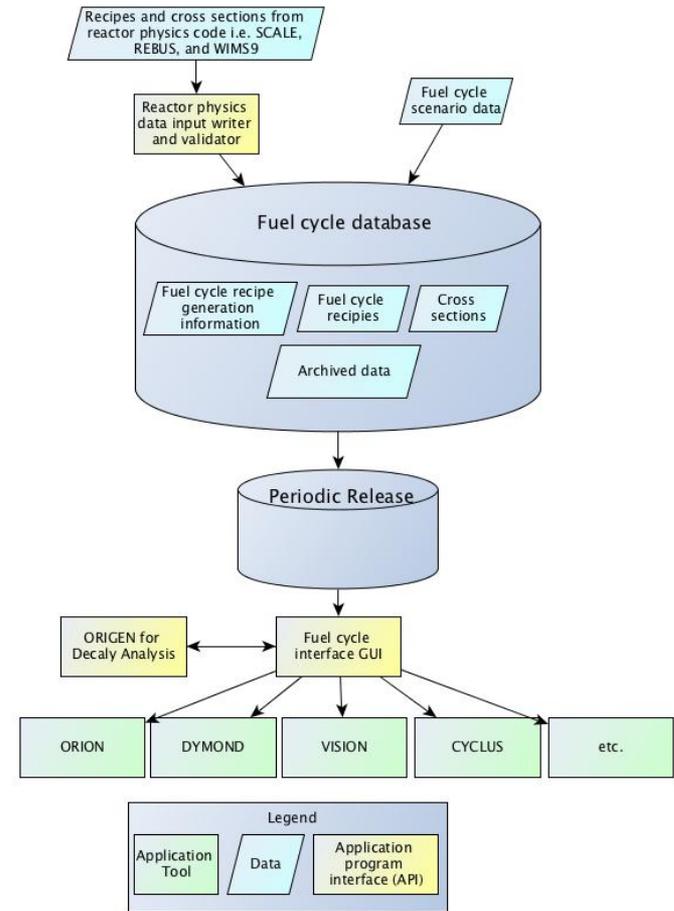
- **Perform top-notch analysis of nuclear energy systems to determine technical and economic viability, identifying benefits and challenges**
- **Utilize and enhance leading-edge systems analysis tools, models and processes & capabilities**
- **Campaign Focus Area of Call: Development and maintenance of leading-edge capabilities to ensure world class analysis of complete nuclear energy systems (NES)**
 - Analysis of interest extends over the full range of the fuel cycle for the NES, from fuel mining to waste management, including reactor system
 - Mass flow data are important for such analysis and a structured format is required for consistency of approach and traceability of data



- A “Transmutation Data Library” (TDL) has been developed by the Systems Analysis and Integration (SA&I) Campaign
- The library contains data for the reactor “stages” (i.e., type/number of reactors) present in a fuel cycle, generated from reactor physics analyses (e.g., descriptive information for the reactors, isotopics, mass flows, etc.)
- Provides a controlled source of technical data for various fuel cycle system analyses/evaluations
- A central database in development is intended to serve as a national resource of information for use by DOE-NE programs and potential users (e.g., universities, industry)
- In FY 2018 an initial version of a MySQL database was created building upon a previous data set in Excel, and previous definitions of functional requirements
 - Contains data generated by the SA&I Campaign and its predecessors



- Recent work in FY 2018 developed a procedure for importing data generated from reactor physics analyses of fuel cycles into the TDL data base
- The procedure includes extensive checking of data for consistency via “unit tests” to support QA objectives on the quality of the data and identify any issues that might impact the suitability of data for a particular fuel cycle for further use



Vision for the TDL

Expectations for the FY 2019 Call

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■ Enhanced usability of the TDL

- Develop portable linkage interfaces between the database and cross section generation tools and/or reactor/fuel cycle analysis tools
- Enhance the initial automated tools developed in FY18 for verification of the data and of the data for reactor stages
- Implement ways to utilize and/or visualize data

■ A software quality assurance plan associated with the interface tool

■ Close interaction with the campaign national laboratory personnel