

CINR Webinar

FC-3: Materials Protection, Accounting and Control Technologies

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Mike Reim

Program Manager

Office of Materials and Chemical Technologies

Office of Nuclear Fuel Cycle and Supply Chain

Office of Nuclear Energy



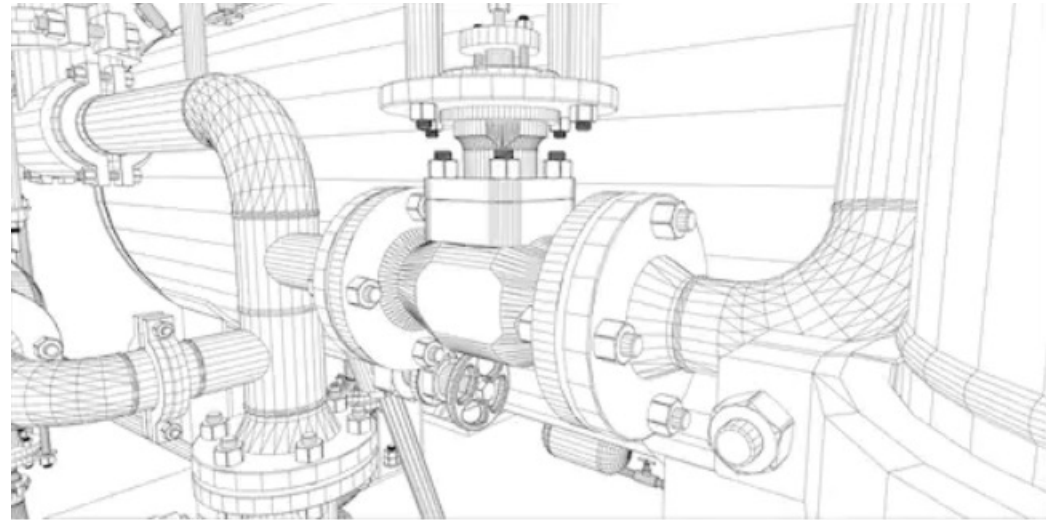
U.S. DEPARTMENT OF
ENERGY

Materials Protection, Accounting and Control Technologies (MPACT)

Goal:

The goal of the Materials Protection, Accounting and Control Technologies (MPACT) campaign is to support U.S. advanced fuel cycle technology developers to effectively and economically address international and domestic nuclear materials control and accounting (MC&A) requirements.

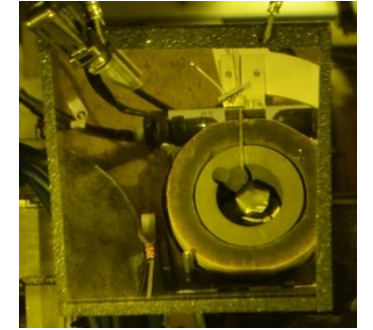
In short: Build tools, get them into the hands of folks who can use them.



Materials Protection, Accounting and Control Technologies

Strategy 1 – DEVELOP, DEMONSTRATE, and DEPLOY innovative technologies, analysis tools, and advanced integration methods.

- ❑ Advanced MC&A technologies
- ❑ Analysis tools and modeling to improve the efficiency and effectiveness of safeguards and security systems
- ❑ Advanced integration methods to apply effective combinations of technology and analysis tools



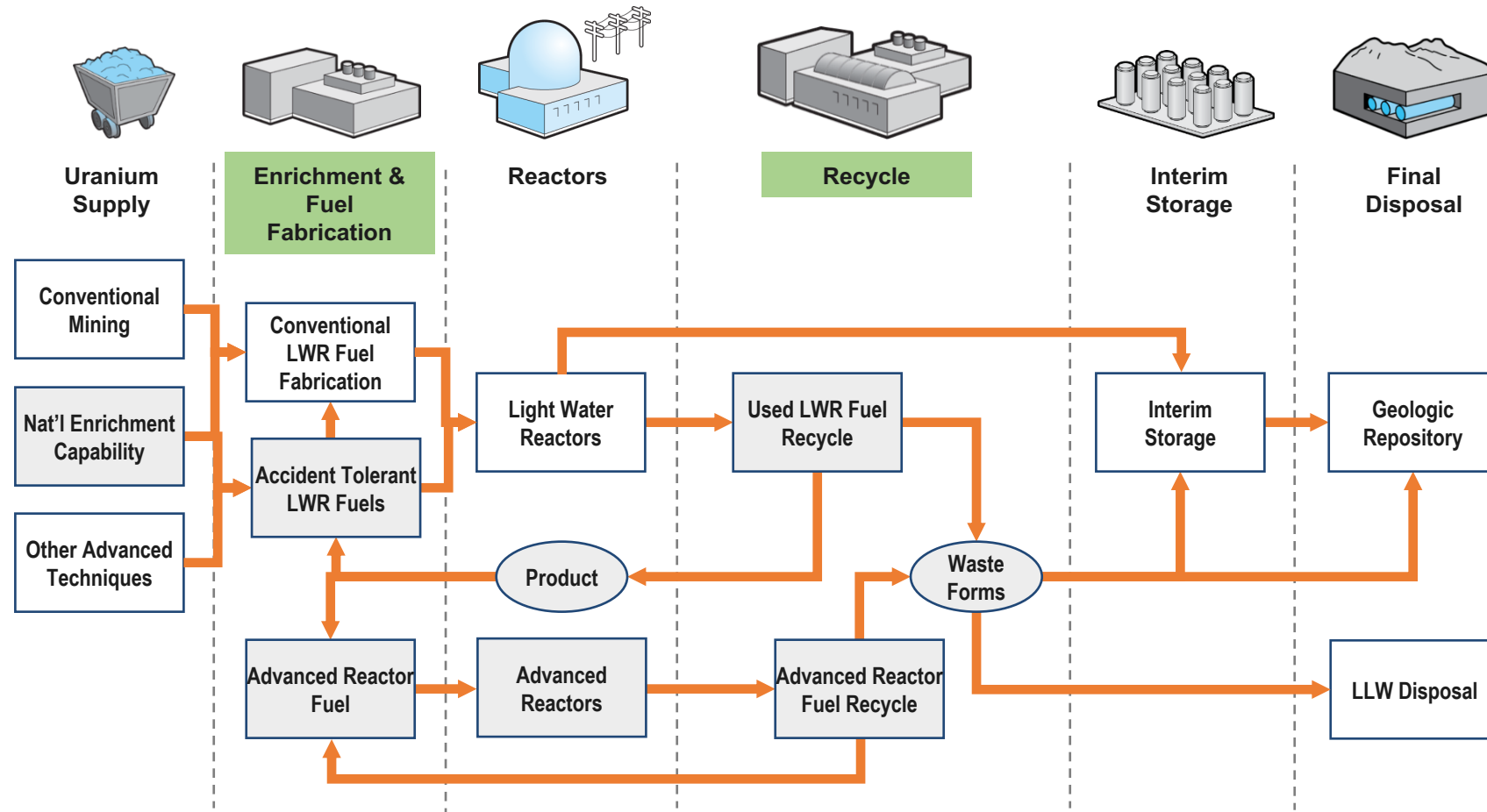
U/TRU measurement system, Idaho National Laboratory

Strategy 2 – Coordinate and engage with government and industry stakeholders early in the technology development process.

- ❑ Perform technical assessments in support of advanced fuel cycle concepts and goals.
- ❑ Develop guidelines for safeguards and security by design and apply them to new facility concepts.

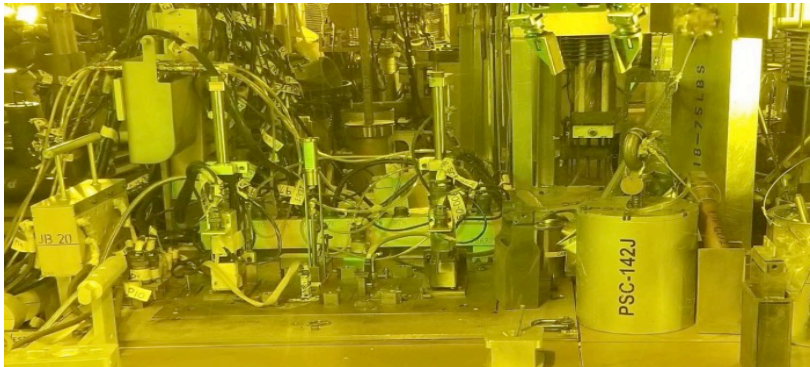


FY21 MPACT MC&A Focus Areas



MPACT R&D Challenges

- ❑ Advanced fuel cycles including fuel fabrication, processing/recycling facilities present safeguards challenges not yet fully addressed by existing technology and approaches.
 - High heat and high radiation environments, online processing and measurements, new product and waste streams, HALEU fuel fabrication, variable radiation backgrounds, etc.
- ❑ Will require a combination of technology, analysis tools, and advanced integration methods in order to:
 - Improve the accuracy and precision of nuclear material accountancy measurements while maintaining or improving their timeliness and cost-effectiveness,
 - Expand the scope of detection to include more indicators,
 - Combine indicators in novel ways to generate new NMA data.



Triple bubbler system in the Hot Fuel Examination Facility,
Idaho National Laboratory



Microcalorimeter gamma spectrometer,
Los Alamos National Laboratory and
University of Colorado Boulder

FC-3: Materials Control and Accounting Technology

The Materials Protection, Accounting and Control Technology (MPACT) program seeks to develop and demonstrate the application of technologies and data integration and analysis tools to enable U.S. domestic nuclear materials management and safeguards for emerging nuclear fuel cycles. Specifically, MPACT develops tools that 1) enable the integration of safeguards and security features into the design and operation of nuclear fuel cycles, and 2) fill nuclear material accounting and control technology gaps for nuclear fuel cycles. Nuclear fuel cycle technologies of interest to MPACT include processes such as fuel fabrication, used nuclear fuel recycling, hold up in bulk nuclear material facilities, used nuclear fuel short and long-term storage, and nuclear processes waste and disposition.

Applications are requested to develop innovative materials control and accounting technologies and tools to increase the accuracy, reliability, and efficiency of nuclear materials quantification, nuclear material tracking capability in nuclear fuel cycle facilities and processes, and process monitoring tools.

Program Contacts:

FEDERAL POC – Mike Reim, 202-748-3383, michael.reim@nuclear.energy.gov

TECHNICAL / LAB POC – Mike Browne, 505-665-5056, mcbrowne@lanl.gov

(UP TO 2 YEARS AND \$400,000)