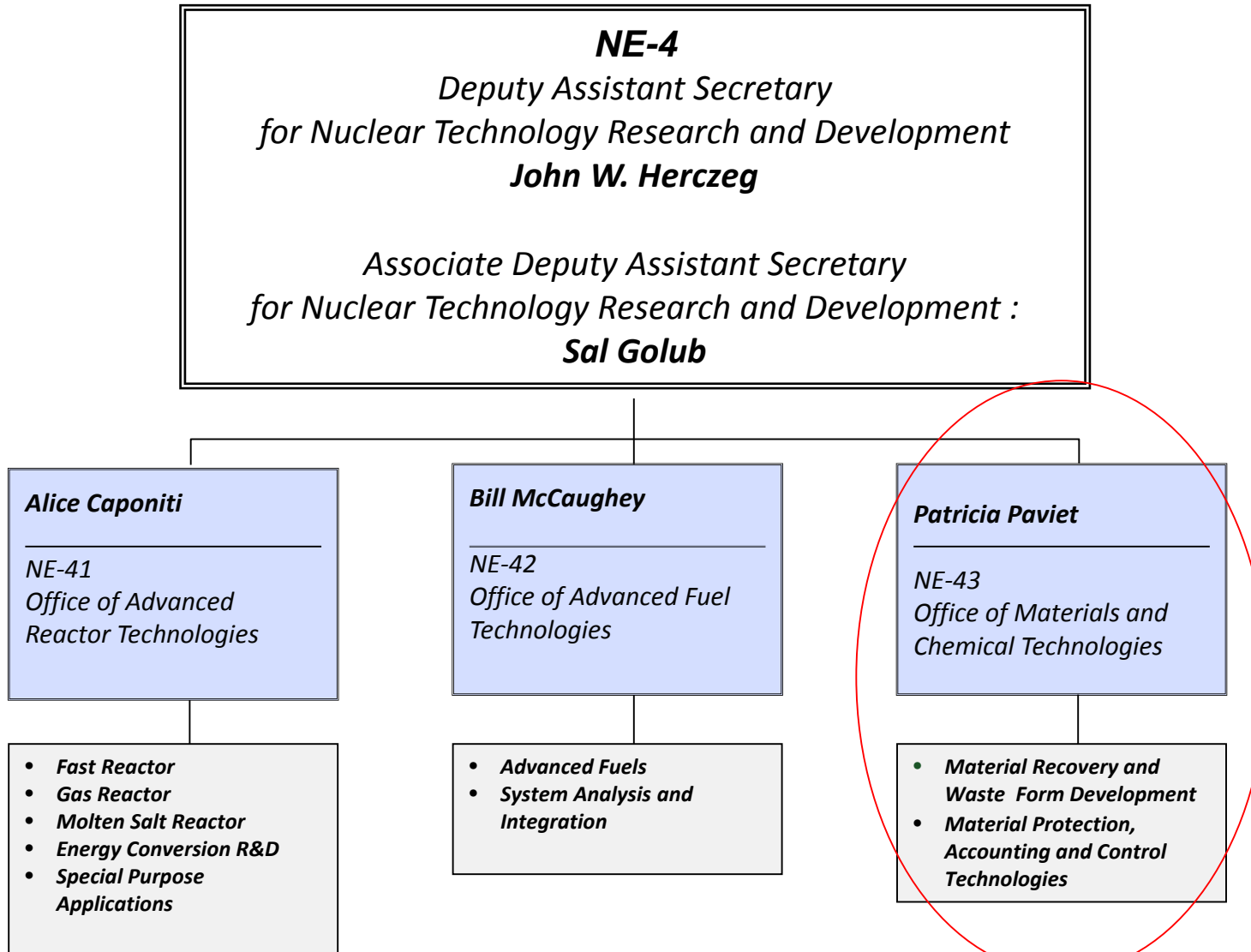# Nuclear Technology Research and Development

Material Protection, Accounting and Control Technologies

Mike Reim, Office of Materials and Chemical Technologies
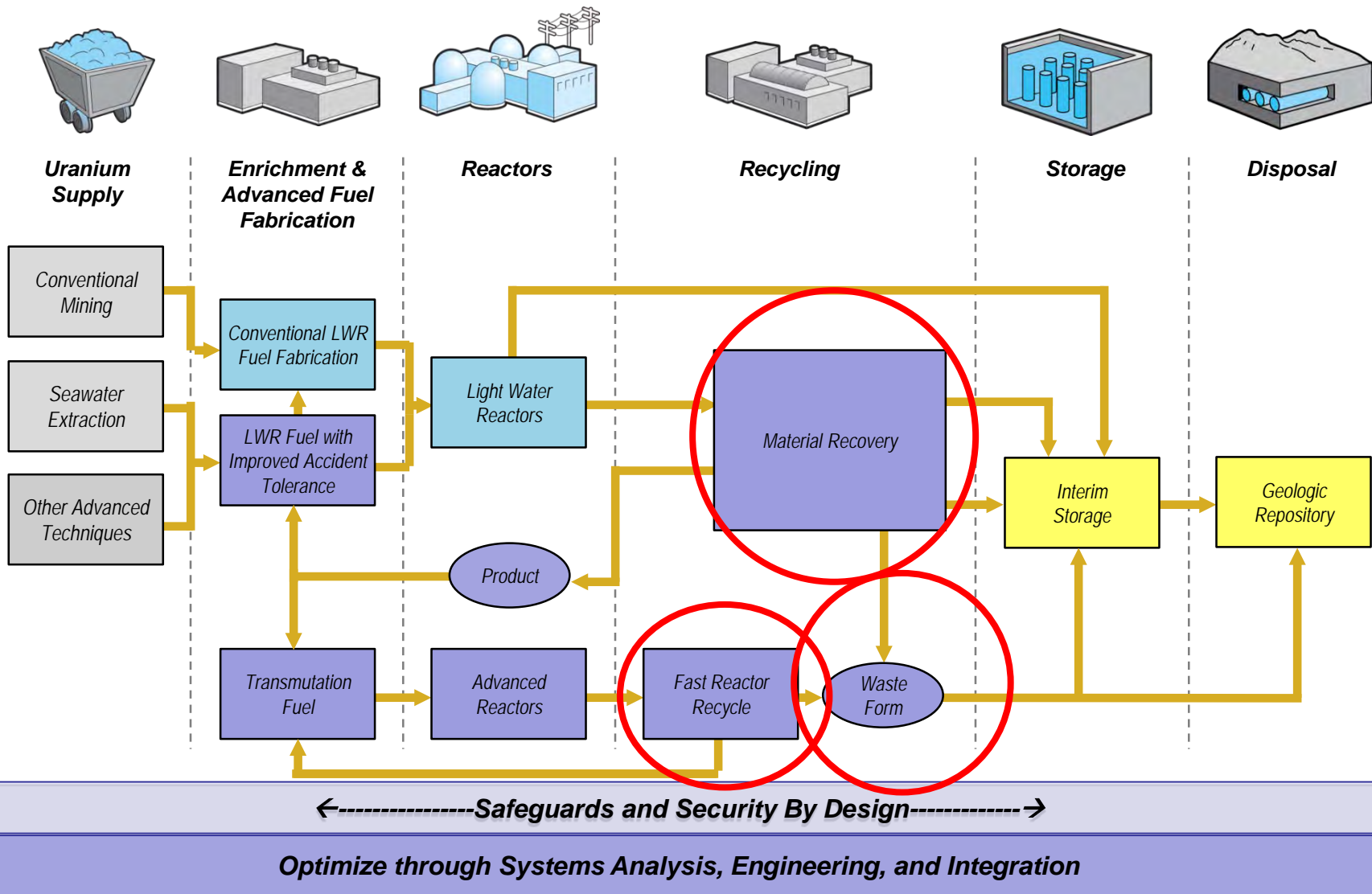
NEUP Webinar

August 10, 2018

NE-4 Organization Structure

NE-4
*Deputy Assistant Secretary
for Nuclear Technology Research and Development*
John W. Herczeg

*Associate Deputy Assistant Secretary
for Nuclear Technology Research and Development :*
Sal Golub

Alice Caponiti

NE-41
Office of Advanced
Reactor Technologies

- **Fast Reactor**
- **Gas Reactor**
- **Molten Salt Reactor**
- **Energy Conversion R&D**
- **Special Purpose Applications**

Bill McCaughey

NE-42
Office of Advanced Fuel
Technologies

- **Advanced Fuels**
- **System Analysis and Integration**

Patricia Paviet

NE-43
Office of Materials and
Chemical Technologies

- **Material Recovery and Waste Form Development**
- **Material Protection, Accounting and Control Technologies**

Nuclear Technology Research & Development

U.S. DEPARTMENT OF ENERGY

Nuclear Energy

Uranium Supply — **Enrichment & Advanced Fuel Fabrication** — **Reactors** — **Recycling** — **Storage** — **Disposal**

- Conventional Mining
- Seawater Extraction
- Other Advanced Techniques

- Conventional LWR Fuel Fabrication
- LWR Fuel with Improved Accident Tolerance
- Transmutation Fuel

- Light Water Reactors
- Product
- Advanced Reactors

- Material Recovery
- Fast Reactor Recycle
- Waste Form

- Interim Storage

- Geologic Repository

←----------------Safeguards and Security By Design-------------→

Optimize through Systems Analysis, Engineering, and Integration

MPACT is about Next Generation Nuclear Materials Management

U.S. DEPARTMENT OF ENERGY
Nuclear Energy

■ **Mission** – Develop innovative technologies and analysis tools to enable *next generation nuclear materials management* for existing and future U.S. nuclear fuel cycles, to manage and minimize proliferation and terrorism risk.

■ **Objectives**

- *Develop and demonstrate advanced material control and accounting technologies that would, if implemented, fill important gaps*
- *Develop, demonstrate and apply MPACT analysis tools to assess effectiveness and efficiency and guide R&D and support advanced integration capabilities*

  Technology Development

- *Perform technical assessments in support of advanced fuel cycle concepts and approaches*

  Applications

- *Develop guidelines for safeguards and security by design and apply to new facility concepts*

  Leadership

U.S. DEPARTMENT OF ENERGY

Nuclear Energy

■ Methods and approaches for integrative advanced process monitoring to enhance nuclear material control and accounting in used nuclear fuel reprocessing facilities.

■ This area includes integrating radiation based and non-radiation based data with the goal of providing quantitative analysis and error propagation to supplement traditional nuclear material control and accounting measures resulting improved performance of the safeguards system to meet NRC Material Control and Accountability (MC&A) requirements.

Virtual Facility Distributed Test Bed
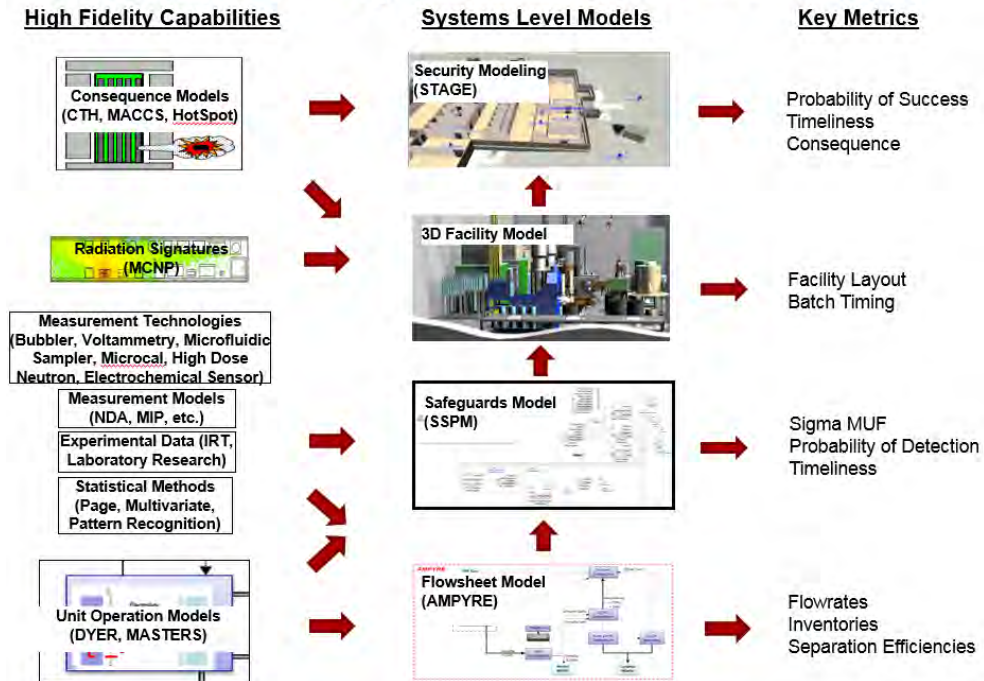
Summary

- **The NTRD Programs are looking forward to partnering with universities to enhance their R&D portfolio and research capabilities.**

- **This call is tailored to research topics that are well suited for university research.**

- **The workscope seeks university researchers who want to actively participate in the MPACT program and enhance interactions with national laboratory research staff.**

- **The NTRD Material Protection, Accounting and Control Technologies management team considers NEUP Principal Investigators to be an integral part of our research programs!**

  – **We encourage and actively seek close engagement with the campaign.**

Contact Information

U.S. DEPARTMENT OF ENERGY

Nuclear Energy

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