



U.S. DEPARTMENT OF
ENERGY

Nuclear Energy

R&D Activities for Used Nuclear Fuel Disposition: Storage, Transportation & Disposal

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Director

Office of Used Nuclear Fuel Disposition

Research & Development

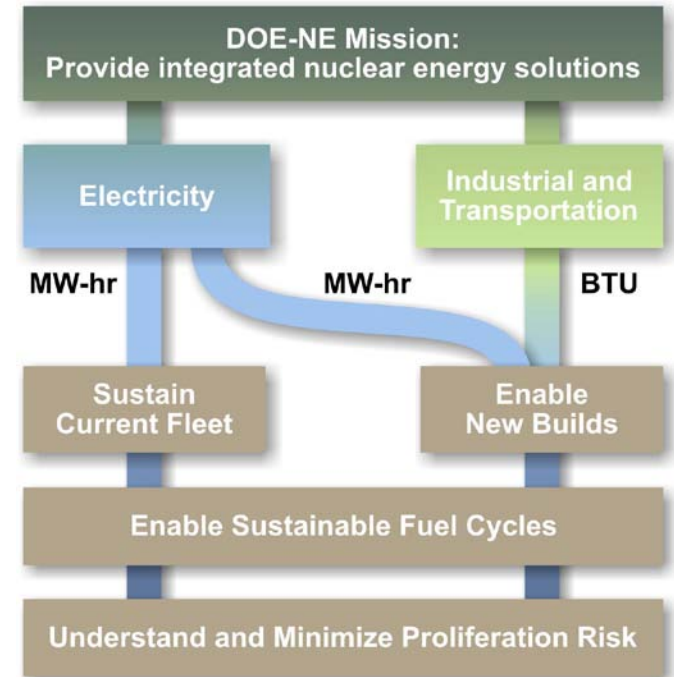
Nuclear Waste Technical Review Board Winter Meeting

February 16, 2011



Nuclear Energy Objectives

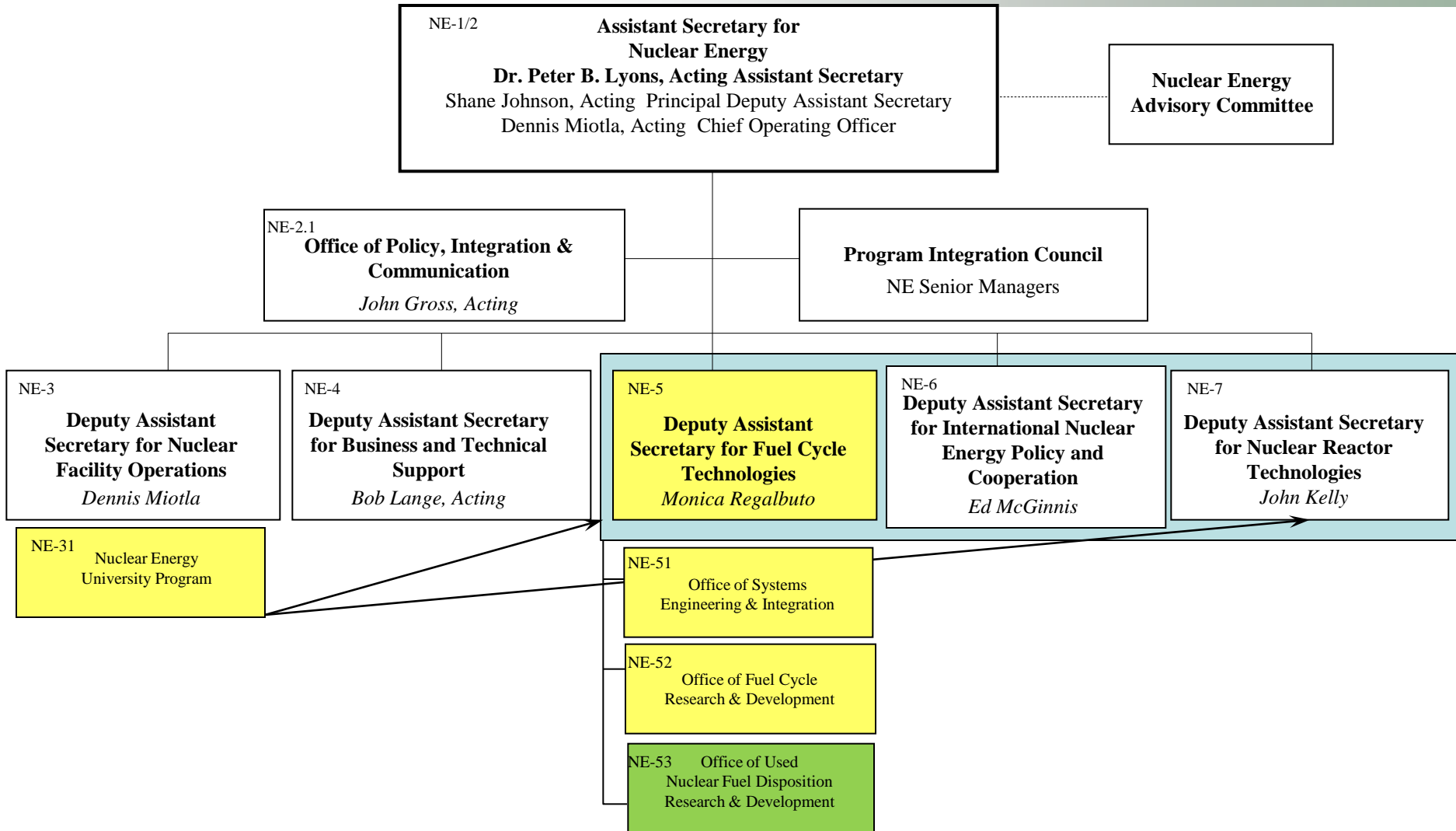
1. Develop technologies and other solutions that can improve the reliability, sustain the safety, and extend the life of current reactors
2. Develop improvements in the affordability of new reactors to enable nuclear energy to help meet the Administration's energy security and climate change goals
3. **Develop sustainable nuclear fuel cycles**
4. Understand and minimize the risks of nuclear proliferation and terrorism





Organization for the Office of Nuclear Energy

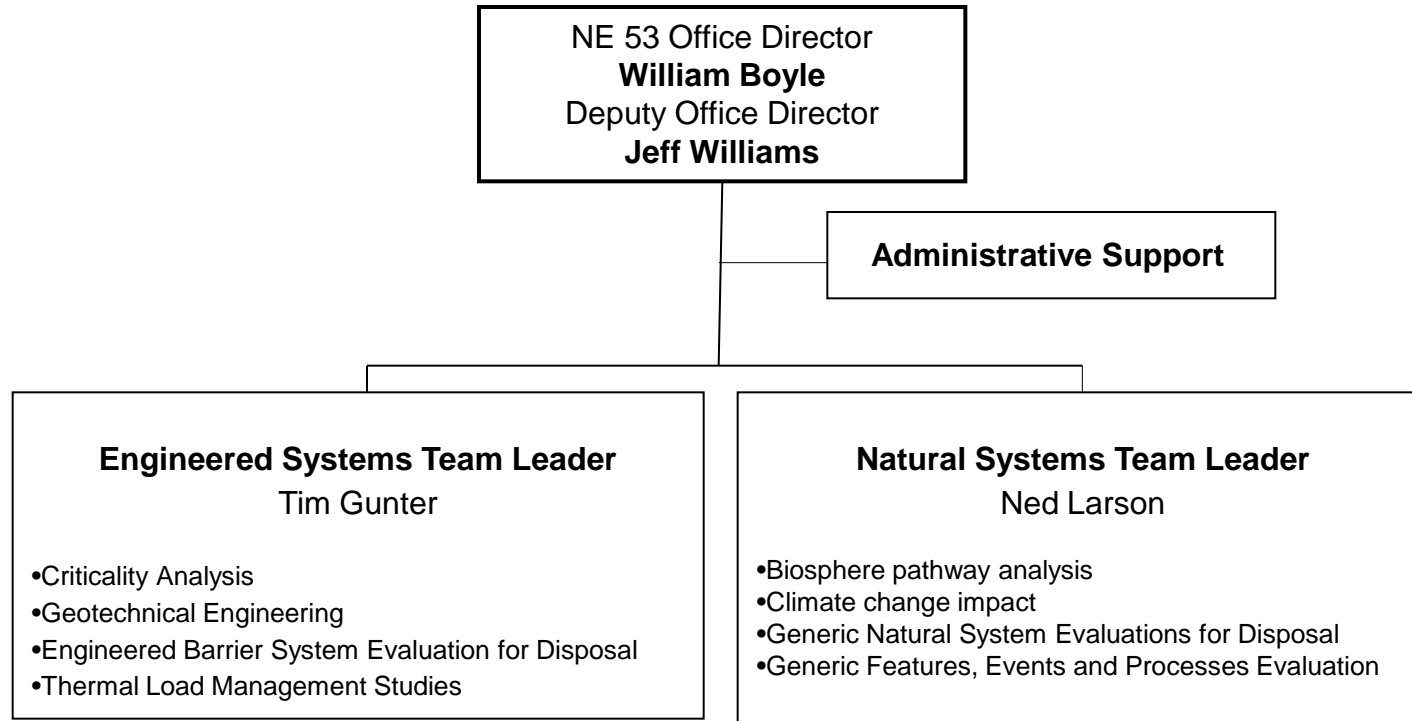
Nuclear Energy



- **The Objective of the Used Fuel Disposition Campaign is to identify alternatives and conduct scientific research and technology development to enable storage, transportation, and disposal of used nuclear fuel and wastes generated by existing and future nuclear fuel cycles.**
- **R&D is focused in three areas**
 - **Storage**
 - **Transportation**
 - **Disposal**



Organization for the Office of Used Fuel Disposition Research & Development (NE-53)





Used Fuel Disposition Campaign Organization

Used Fuel Disposition Campaign

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Federal Program Manager

Peter Swift

National Technical Director

Four Control Accounts for the Used Fuel Disposition Campaign

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UFD Campaign Near-Term Objectives

- **Provide technical expertise to inform policy and decision-making regarding the management of used nuclear fuel and radioactive waste that would be generated under existing and potential future nuclear fuel cycles;**
- **Develop comprehensive understanding of the current technical bases for storing and transporting used nuclear fuel and high-level nuclear waste to identify opportunities for long-term research and development;**
- **Develop a comprehensive understanding of the current technical bases for disposing of used nuclear fuel, low-level nuclear waste, and high-level nuclear waste in a range of potential disposal environments to identify opportunities for long-term research and development; and**
- **Model development for the evaluation of disposal system performance in a variety of generic disposal system concepts.**

UFD Campaign Long-Term Objectives

- **Develop a fundamental understanding of the performance of potential storage and transportation system concepts over many decades for a variety of used nuclear fuel types and radioactive waste forms based on simulation and experiment;**
- **Develop a fundamental understanding of disposal system performance in a range of environments for potential wastes that could arise from future nuclear fuel cycle alternatives through theory, simulation, testing, and experimentation; and**
- **Develop an analysis and modeling capability, validated by experiment, for the performance of storage and disposal options for a range of fuel cycle alternatives, evolving from generic models to more robust models of performance assessment, integrating with Nuclear Energy Advanced Modeling and Simulation (NEAMS) activities.**

- **Storage and Transportation**
 - Conceptual Evaluations
 - R&D Opportunities
 - Security
 - Transportation



■ Disposal Research

- Technical Basis for Geologic Media
- FEPs
- Generic EBS Evaluation
- Generic Natural System Evaluation
- Generic Disposal System Level Modeling
- Inventory
- LLW Disposition