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Exploring the Options for SNF/UNF in Light of US and International Decisions Office of Nuclear Fuel Cycle Technologies Perspective

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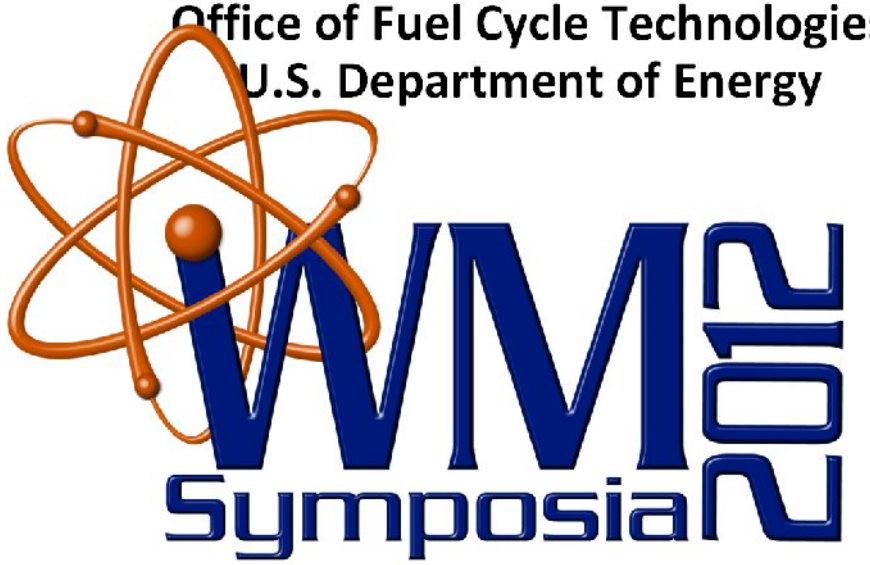

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Fuel Cycle Technologies (FCT) - Mission

Ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions.

Goal 3: Secure Our Nation

- Enhance nuclear security through defense, nonproliferation, and environmental efforts.

DOE

Advance nuclear power as a resource capable of making major contributions in meeting the Nation's energy supply, environmental, and energy security needs by resolving technical, cost, safety, security and regulatory issues through research, development, and demonstration.

NE

Develop sustainable fuel cycles and Used Fuel waste management strategies that improve resource utilization, minimize waste generation, improve safety and limit proliferation risk.

FCT

http://energy.gov/sites/prod/files/2011_DOE_Strategic_Plan_.pdf
http://www.ne.doe.gov/pdfFiles/NuclearEnergy_Roadmap_Final.pdf

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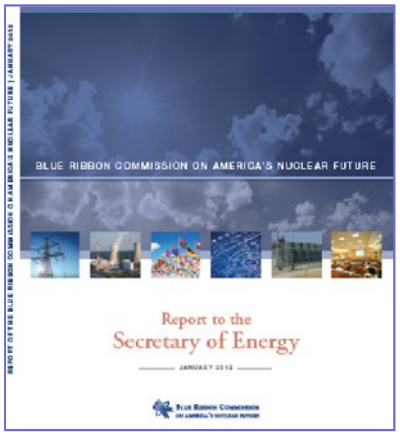
Objectives – Currently Evolving



Blue Ribbon Commission

www.brc.gov

- Recommendations could lead to near term program shifts and a major restructuring in the longer term.
- Potential to consider consolidated storage and associated transport to centralized storage location.

Fukushima Event

- May lead to shifting program priorities.
- Focus on the development of advanced LWR fuels with enhanced accident tolerance.

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Current Program Objectives

Near Term

- **Address BRC recommendations for Used Fuel Disposition – *Administration strategy to Congress within 6 months***
- **Increase focus on advanced LWR fuels with enhanced accident tolerance.**
- **Down select fuel cycle options for further development.**

Medium Term

- **Complete implementation plan for developing a Test and Validation Complex for extended storage of used nuclear fuel.**
- **Evaluate benefits of various geologic media for disposal.**
- **Conduct science based, engineering driven research for selected fuel cycle options.**

Long Term

- **Execute Test and Validation Complex for extended storage of Used Fuel.**
- **Conduct engineering analysis of disposal site(s) for selected geologic media.**
- **Demonstrate the selected fuel cycle options at engineering scale.**

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Nuclear Fuel Cycle Options

- **Fuel cycle options support National energy objectives that focus on clean energy, economic prosperity, and national security.**
- **Evaluate fuel cycle options:**
  - Once-Through
  - Modified Open
  - Full Recycle
- **Currently no country has commercially implemented a fully closed fuel cycle although several are pursuing that goal.**
  - The U.S. currently uses a once through fuel cycle

Sustainable fuel cycles that:

- Improve uranium resource utilization
- Maximize energy generation
- Reduces waste generation
- Improve safety
- Protect the environment
- Limit proliferation risk
- Are economically viable

WM Symposia

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FY 2011-12 Budget Summary

Dollars in thousands

Activity/Sub-Activity	FY 2011 Current	FY 2012 Request	FY 2012 Approp.	FY 2013 Request
Separations and Waste Forms	37,133	36,893	32,224	38,778
Advanced Fuels	50,648	40,443	58,656	40,378
Transmutation R & D	5,721	3,109	0	0
Modeling and Simulation	22,350	0	0	0
Spent Nuclear Fuel Analysis	0	0	9,942	0
Systems Analysis and Integration	23,775	20,466	17,029	22,882
MPACT	6,674	7,864	5,152	7,353
Used Nuclear Fuel Disposition	32,535	37,249	59,650	59,668
Fuel Resources	3,592	4,646	3,607	6,679
Total	**182,428**	**150,670**	**186,260**	**175,438**