



Enhancing the Technical and Regulatory Bases for Extended Storage and Transportation of Spent Nuclear Fuel

NRC Public Meeting

Extended Storage and Waste Confidence: Staff Plans and Activities

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Background





Regulating Extended Spent Fuel Storage and Transportation: Needs

- Potential changes to regulations and guidance
- Opportunity to improve integration of regulations and guidance governing the back end of the fuel cycle
- Development and application of risk-informed regulatory approaches

Regulating Extended Spent Fuel Storage and Transportation: Approach

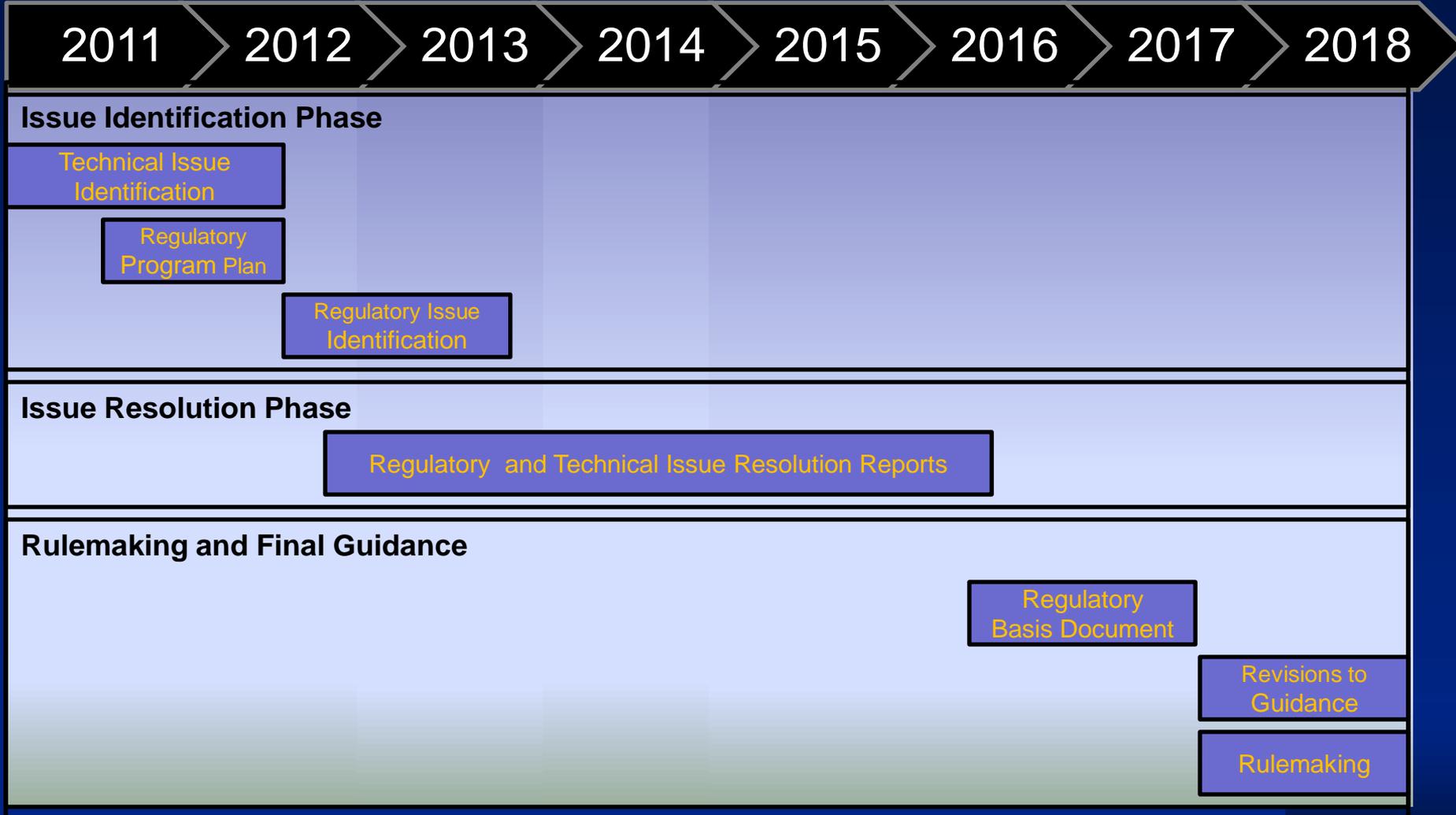
- Enhance technical basis for regulating extended storage of spent nuclear fuel
 - Identify technical issues associated with long-term storage
 - Perform focused research on technical issues of regulatory significance
- Identify regulatory framework revisions needed
- As appropriate,
 - revise regulations
 - develop or revise guidance
 - develop staff capabilities



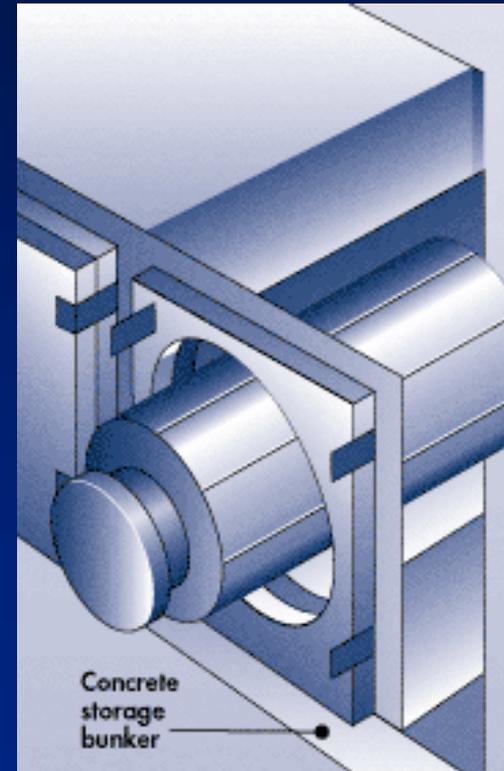
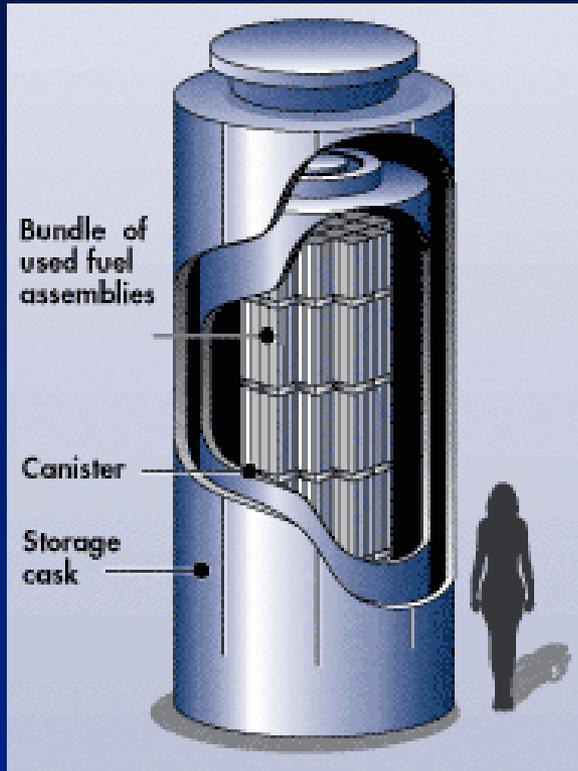
Regulating Extended Spent Fuel Storage and Transportation: Plans

- Phase 1: Identify technical and regulatory issues associated with extended spent fuel storage
- Phase 2: Perform focused research on technical issues and develop regulatory options as needed
- Phase 3: Regulatory framework revisions

Regulating Extended Spent Fuel Storage and Transportation: Timelines



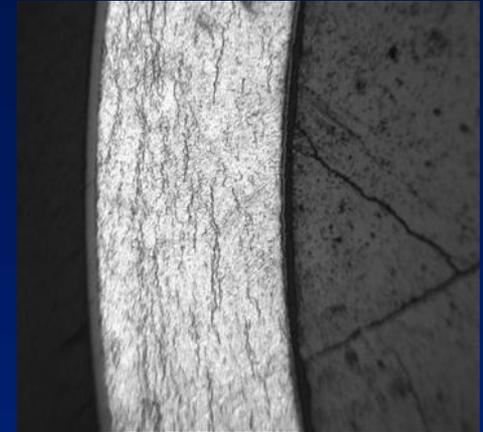
Extended Spent Fuel Storage and Transportation: Technical Issues Identification



Potential Technical Issues

Cladding Integrity

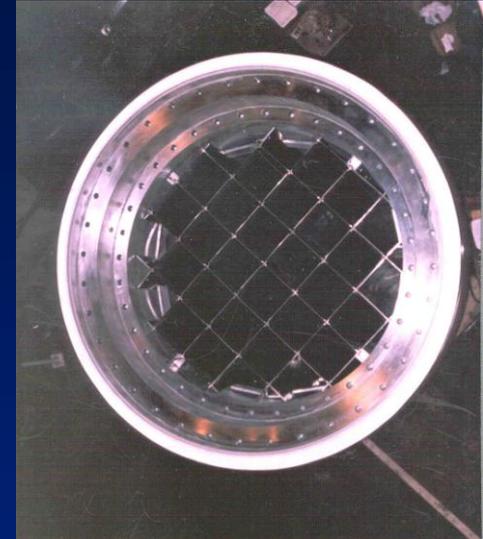
- Safety Functions
 - Confinement (fission product barrier)
 - Physical integrity (retrievability and geometry control for criticality)
- Technical Challenges
 - Higher burnup levels
 - Temperature effects
 - New cladding types
 - In-situ monitoring in sealed canisters



Potential Technical Issues

Canister Integrity

- Safety Functions
 - Confinement
 - Criticality control
- Technical Challenges
 - Long-term corrosion
 - Basket properties
 - Absorber efficiency
 - Monitoring sealed internals



Potential Technical Issues

Overpack Performance

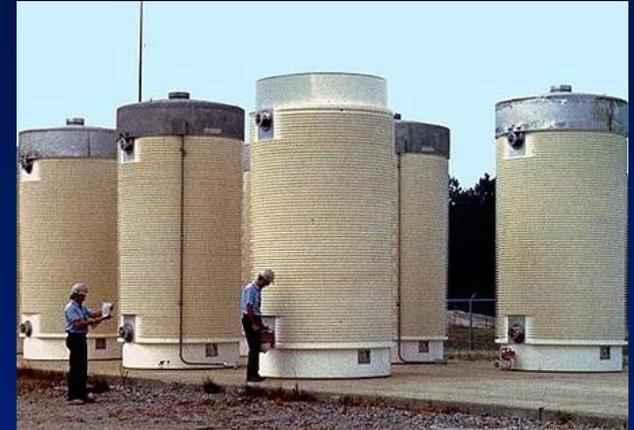
- Safety Functions
 - Shielding
 - Heat transfer

- Technical Challenges
 - Long-term degradation
 - Response to external natural events and external disruption



Current NRC Regulatory Framework for Storage

- Renewable Term Licenses
- Aging Management Plan
 - Time-limited aging analyses
 - Design for prevention
 - Monitoring
 - Maintenance
 - Corrective Actions



Potential Regulatory Issues

- Storage, transportation, and disposal integration
- Long term cladding integrity and retrievability
- Financial assurance issues





Regulating Extended Spent Fuel Storage and Transportation: Stakeholder Engagement Strategies

- Status Updates
- Reports for Comment
- Annual Meetings and Workshops

Summary

- Assuring safety and security as changes occur in the national strategy by developing predictable regulatory programs
- NRC is preparing to
 - develop a regulatory framework to better support long-term dry storage
 - coordinate EST technical basis work with environmental impact analysis for long-term update of Waste Confidence
- Opportunities for stakeholder input through public meetings, workshops, and draft reports