



# **Compatibility of Requirements for Storage and Transportation of Spent Nuclear Fuel**

**Retrievability, Cladding Integrity, and Safe Handling**

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Meeting to Obtain Stakeholder Feedback on Enhancements  
to the Licensing and Inspection Programs for  
Spent Fuel Storage and Transportation

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# Background

- Revisiting the Paradigm for Spent Fuel Storage and Transportation Regulatory Programs (SRM COMDEK-09-0001)
- Project Plan for Regulatory Program Review to Support Extended Storage and Transportation (COMSECY-10-0007)
  - Compatibility of storage and transportation
- Public meeting July 27, 2011
  - Retrievability
  - Burnup Credit
  - Moderator Exclusion

# Background – Regulatory Framework

- Nuclear Waste Policy Act Legislation
  - Interim Storage
  - Monitored Retrievable Storage
  - Disposal
- Regulations
  - 10 CFR Part 71 - Transportation
  - 10 CFR Part 72 - Storage
- Regulatory Guidance
  - ISG-1: Classifying the Condition of Spent Fuel
  - ISG-2: Retrievability
  - ISG-11: Cladding Considerations for Storage and Transport

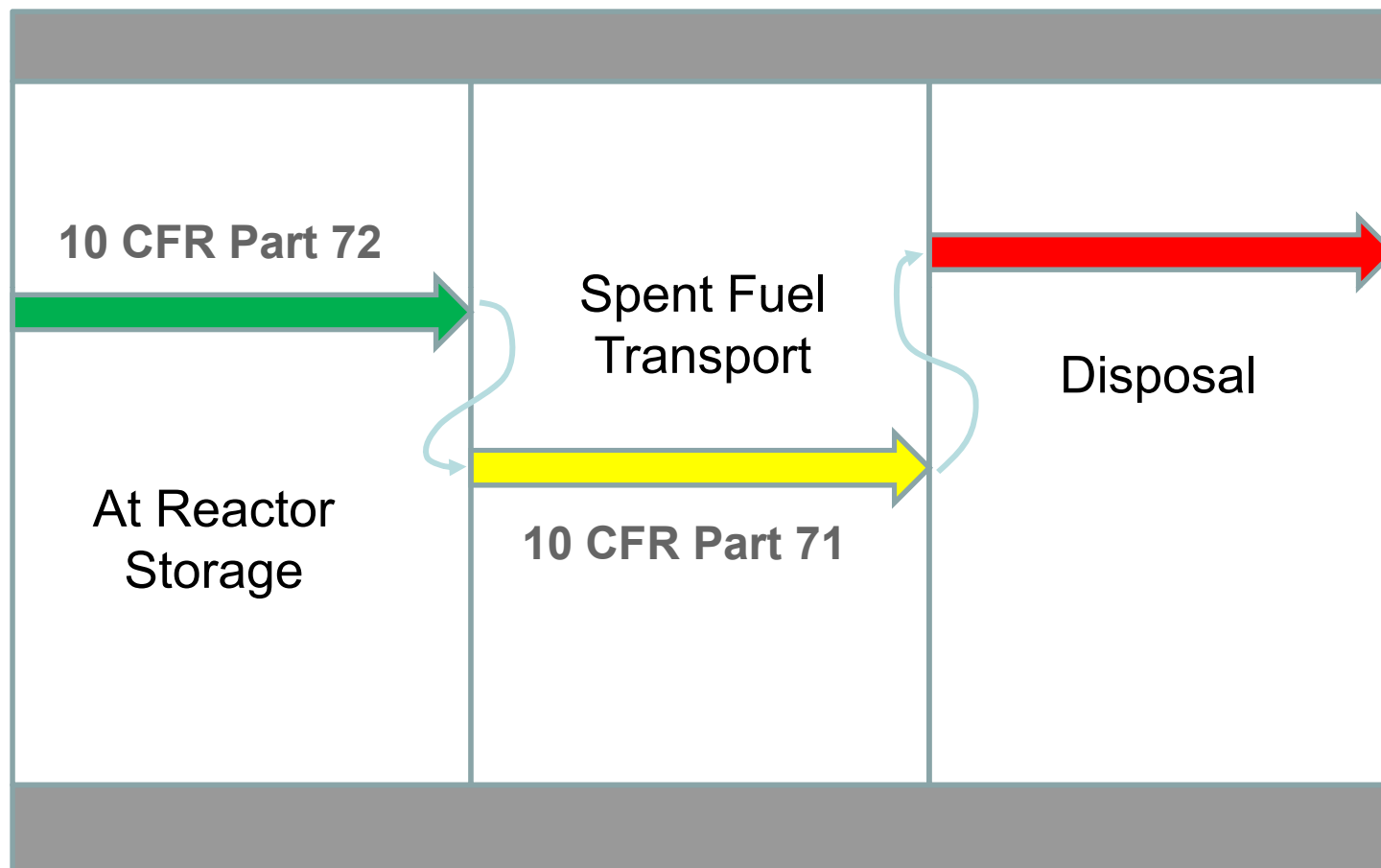
## Issue Description

- Evaluating compatibility of policies and regulations between storage and transport
- Storage
  - Retrievability – 72.122(l) (see SECY-01-0076)
  - Cladding integrity – 10 CFR 72.122(h)
- Transportation
  - Fissile material geometry after normal conditions of transport – 10 CFR 71.55(d)(2)
  - Criticality control – 71.55 and 71.59
  - Opening and unloading operations – 10 CFR 71.89 and 10 CFR 20.1906(e)

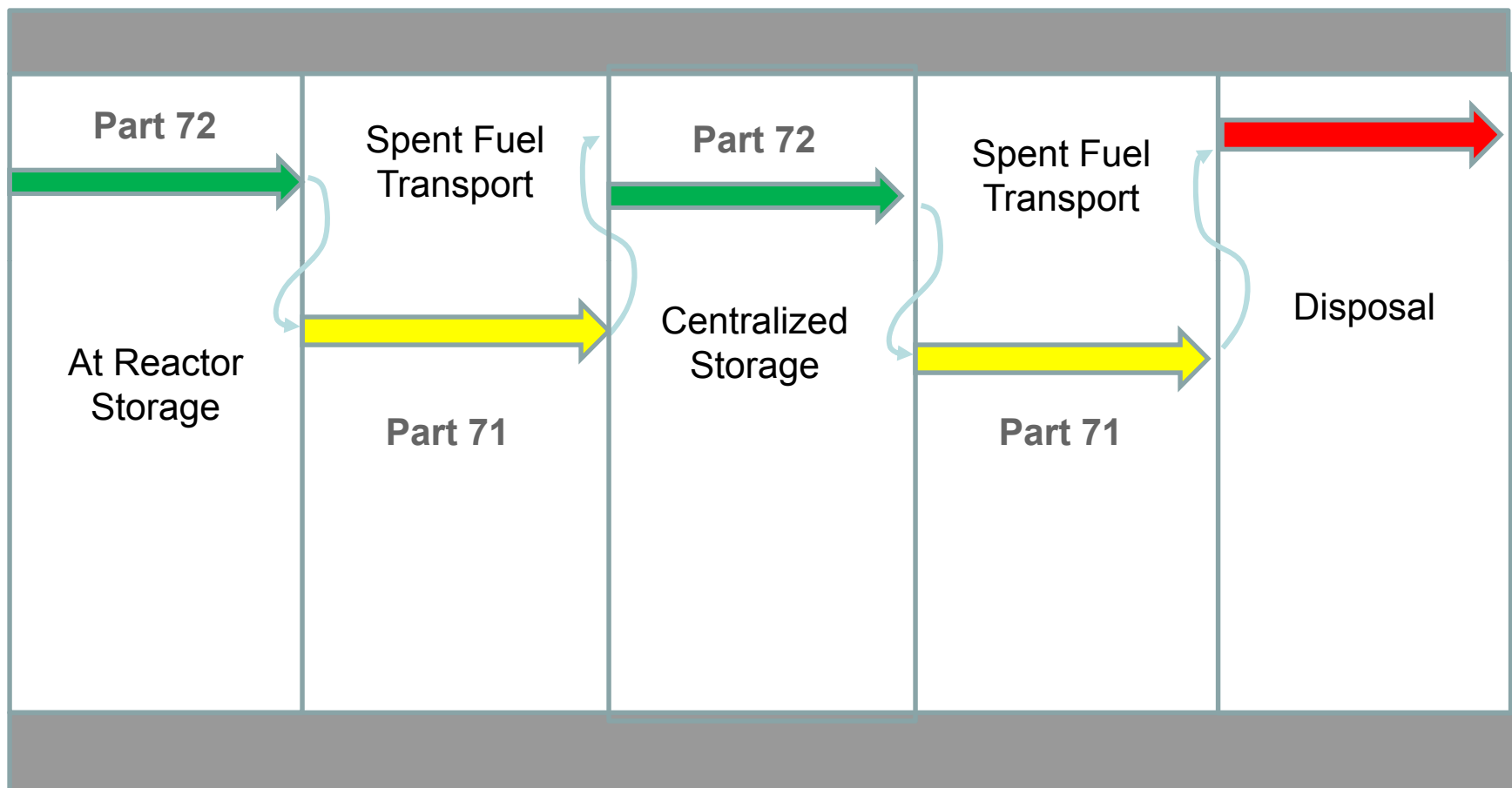
# Considerations

- Different back end model prior to disposal?
- Longer storage durations
- High burnup fuel
- Transportation of sealed canisters that have been in storage for many years
- Repackaging?
  - When?
  - By whom?

## Considerations – Old Model



# Consideration – New Backend Model?



# Considerations

- Different back end model prior to disposal?
- Longer storage durations
- High burnup fuel
- Transportation of sealed canisters that have been in storage for many years
- Repackaging?
  - When?
  - By whom?



# Considerations - Retrievability

- Individual Fuel Assembly Retrievability
  - Maximizes future handling options
  - Additional cladding research and laboratory studies
  - Implement storage demonstration programs
  - Potential significant impact for repackaging loaded canisters, if cladding integrity can not be demonstrated
- Canister-Based Retrievability
  - Rely upon dual-purpose canister technologies
  - Overcomes some near-term certification hurdles
  - Potential significant impact if repackaged later
  - May limit future disposal options
  - May need additional research on canister behavior

# Considerations – Cladding Integrity

- Storage
  - Generally, relied upon to meet retrievability for storage
  - Provides criticality geometry control
- Transportation
  - Provides geometry control for criticality safety
  - Unloading and handling at receipt facility

# Conclusion

- Retrievability and cladding integrity are potential policy issues based, in part, on:
  - Regulatory safety criteria and safety barrier concepts
  - Present and future operational needs for storage and transport
  - Consideration of technological limitations
  - Spent fuel management risks and uncertainties



# Contact

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