Overview

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Regulatory Structure

• 10 CFR Part 72 – Storage
  – Storage can be approved for a site or by general license
  – General design criteria
    • Provide reasonable assurance that spent fuel can be received, handled, packaged, stored, and retrieved without undue risk to the health and safety of the public
    • Protection against environmental conditions and natural phenomena (earthquakes, tornadoes, lightning, hurricanes, floods, tsunamis, and seiches)
    • Protection against fires and explosions
    • Protection against external man-induced events
  – Acceptance criteria
    • Nuclear criticality safety – maintained subcritical
    • Radiological protection – dose limits to individual worker and to individual located beyond the controlled area boundary (≤25 mrem annual dose)

• 10 CFR Part 71 – Transportation
  – Type B Fissile packaging required for transport of spent fuel
  – Subject to Normal Conditions of Transportation and Hypothetical Accident Conditions tests
    • 30-ft Free Drop
    • Puncture
    • Thermal (30-min, 800°C, fully engulfing fire)
    • Immersion, equivalent to 50-ft head of water
  – Acceptance criteria after the accident conditions tests
    • Remain subcritical
    • No escape of radioactive material exceeding a total A2 in one week
    • External dose rate may not exceed 1 rem/hr at 1 m from the external surface of the package
  – Harmonized with IAEA requirements for transportation

Package-specific Requirements - Transportation

Transportation is performed in the public domain

• Subcriticality
  – Transportation regulations require analysis of multiple packages (limiting the number of packages that can be shipped together)
  – Transportation regulations require consideration of water in-leakage

• Radiation Protection
  – Transport limit is 10 mrem/hr at 2m from the outer lateral surfaces/vertical planes of the vehicle (including top and underside)

• Temperature
  – The temperature of accessible surfaces may not exceed 185°F as prepared for transport
Decommissioned Sites

- Shutdown plants
  - Trojan
  - LaCrosse
  - Rancho Seco
  - Yankee Rowe
  - Humboldt Bay

- Storage systems have an associated transportation certificate
  - Confirmation the as-loaded contents meet the certificate
  - Inspection of the components for transportation against the certificate
  - Fabrication of some transport components (impact limiters, transport overpack)
  - Possible revisions to the transport certificate to evaluate and incorporate any design or content changes

Spent Fuel Transportation Risk Assessment (NUREG-2125)

- Published in January 2014
- Radiation emitted from a cask during transportation is a fraction of the natural background radiation
- The risk from accidental release is extremely low
- Regulations are adequate to protect the public against unreasonable risk
High-Burnup Fuel (HBF)

- High burnup fuel
  - > 45 GWd/MTU
- Cladding integrity –
  - Storage and transportation
  - Degradation
- Regulatory Issue Summary (RIS)
  - Developed by taskforce in Division of Spent Fuel Management
  - High-level background and guidance on possible licensing approaches for HBF for storage and transportation
  - Expected to be issued for public comment in February 2015

Questions?