

Report from the U.S. Nuclear Regulatory Commission on the Transportation of Radioactive Material in Type B Packages and Related Activities

Joint Radioactive Materials Transportation Committee & the
Transuranic Waste Transportation Working Group
Southern States Energy Board

David W. Pstrak
Senior Project Manager
Material Control and Accounting Branch
Division of Fuel Management
Office of Nuclear Material Safety and Safeguards
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Overview

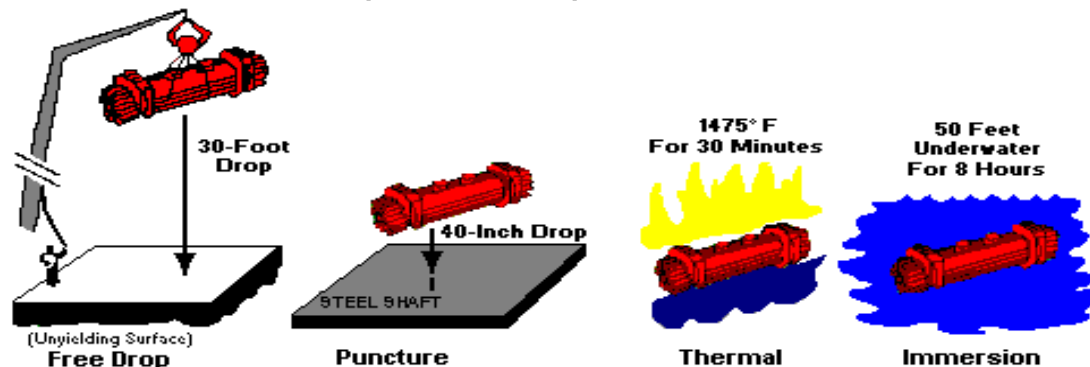
- ▶ NRC's Role in Regulating Shipments of Spent Nuclear Fuel
- ▶ Package Testing
- ▶ Radioactive Materials that Require a Type B Transportation Package
- ▶ Package Review Times
- ▶ Consolidated Interim Storage Facilities
- ▶ NRC Transportation Studies and Related Information
- ▶ Questions

NRC's Role in Regulating Spent Nuclear Fuel Shipments

- Certification of Shipping Casks
- Inspection of Cask Designers and Fabricators
- Enforcement of NRC and DOT safety rules
- Enforcement of Physical Protection Measures
- Emergency Response – assistance to first responders

NRC's Role in Regulating Spent Nuclear Fuel Shipments

- Spent fuel shipping packages are certified to be accident resistant. They must withstand:
 - 30-foot drop onto unyielding surface.
 - 40-inch drop onto a steel puncture pin.
 - 30-minute fully engulfing 1475° F fire.
 - Immersion test (50 feet).



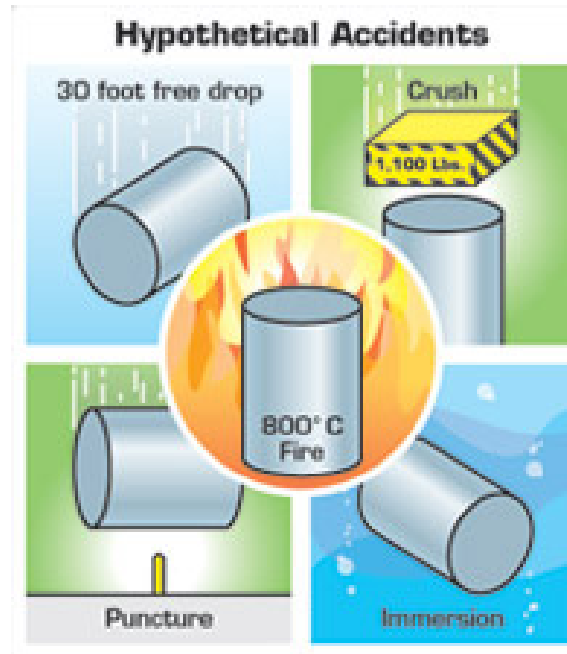
Normal Conditions of Transport Tests for Type B Packages 10 CFR 71.71

1. Heat
2. Cold
3. Pressure changes
4. Vibration
5. Water spray
6. Free drop
7. Compression
8. Penetration



Hypothetical Accident Condition Tests for Type B Packagings 10 CFR 71.73

1. Free Drop
2. Crush
3. Puncture
4. Thermal
5. Immersion - fissile package
6. Immersion - all packages



Radioactive Materials that Require a Type B Transportation Package

- Type B quantities of radioactive material
 - $> A_1$ or A_2
- Highway Route Controlled Quantities (HRCQ)
 - $> 3,000 \times A_1$ or A_2 , or
 - $> 27,000$ Curies
- Category 1 and Category 2 materials
 - 10 CFR Part 37
- Spent nuclear fuel

NRC Review Time for Transport and Storage Applications

▶ Amendments

- ▶ Fresh fuel transport package - up to 1 year
- ▶ Spent fuel transport package - 1 to 2 years
- ▶ Spent fuel storage cask - 1 to 2 years

▶ New package designs

- ▶ Fresh fuel transport package - 1 to 1.5 years
- ▶ Spent fuel transport package - 2 years
- ▶ Spent fuel storage cask - 2 years

Radiation Level Limits

- ▶ 10 CFR 71.87
- ▶ 49 CFR 173.441
- ▶ Package
 - ▶ 200 mr/hr
 - ▶ 1,000 mr/hr (closed)
- ▶ Vehicle
 - ▶ 200 mr/hr
- ▶ 2 meters from vehicle
 - ▶ 10 mr/hr
- ▶ Occupied spaces of the vehicle
 - ▶ 2 mr/hr



Consolidated Interim Storage Facilities (CISF)

- **Waste Control Specialists (WCS) Application**
 - ▶ Application received April 2016 for proposed site in Andrews County, TX
 - ▶ Accepted by NRC in January 2017 for review
 - ▶ Suspension requested by WCS in April 2017
 - ▶ NRC suspended WCS CISF application review
 - ▶ New applicant Interim Storage Partners, LLC (ISP) requested resumption of the NRC review (Jan 2018)
 - ▶ NRC anticipates completing its safety and environmental review in mid-2021
- **Holtec Application**
 - ▶ Application received March 2017 for proposed site in Lea County, NM
 - ▶ Application accepted for review (February 2018), and is currently in Technical Review
 - ▶ Staff issued 4 requests for additional information; Holtec has responded to all
 - ▶ NRC conducted 6 public scoping meetings in 2018 as part of the environmental review process
 - ▶ NRC anticipates completing its safety and environmental review in early-2021

Harmonization with the IAEA Transportation Standards

- ▶ Issues paper (Nov 2016) [ML16299A298]
- ▶ Regulatory Basis Completed (Sept 2019)
- ▶ Schedule
 - ▶ Draft Proposed Rule (Oct 2020)*
 - ▶ Draft Regulatory Guidance (March 2021)*
 - ▶ Final Rule (Jan 2022)
 - ▶ Final Regulatory Guidance (April 2022)
- ▶ Working with U.S. Department of Transportation

* Indicates public comment opportunity

NRC Transportation Studies and Related Information

- ▶ NUREG-0170: “Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes” (1977) [ML12192A283 for Vol. 1 and ML022590370 for Vol. 2]
- ▶ NUREG/CR-4829: “Shipping Container Response to Severe Highway and Railway Accident Conditions” (1987) [ML070810403 and ML070810404]
- ▶ NUREG/CR-6672: “Reexamination of Spent Fuel Shipment Risk Estimates” (2000) [ML003698324]
- ▶ NUREG/CR-6886: “Spent Fuel Transportation Package Response to the Baltimore Tunnel Fire Scenario” (2009) [ML090570742]

NRC Transportation Studies and Related Information (continued)

- ▶ NUREG-2125: “Spent Fuel Transportation Risk Assessment - Final Report” (2014) [ML14031A323]
- ▶ NUREG/CR-7209: “A Compendium of Spent Fuel Transportation Package Response Analyses to Severe Fire Accident Scenarios - Final Report” (2017) [ML17066A101]
- ▶ NUREG/BR-0292, Rev. 2: “Safety of Spent Fuel Transportation” (2017) [ML16237A133]
- ▶ NUREG-0561, Rev 2: “Physical Protection of Shipments of Irradiated Reactor Fuel” (2013) [ML13120A230]

Questions?

Thank you for your attention.