

Decommissioning Nuclear Power Plants: What Congress, Federal Agencies and Communities Need to Know

*Highly Radioactive Irradiated Nuclear Fuel:
Need for Hardened On-Site Storage; Risks of Off-Site Transport*

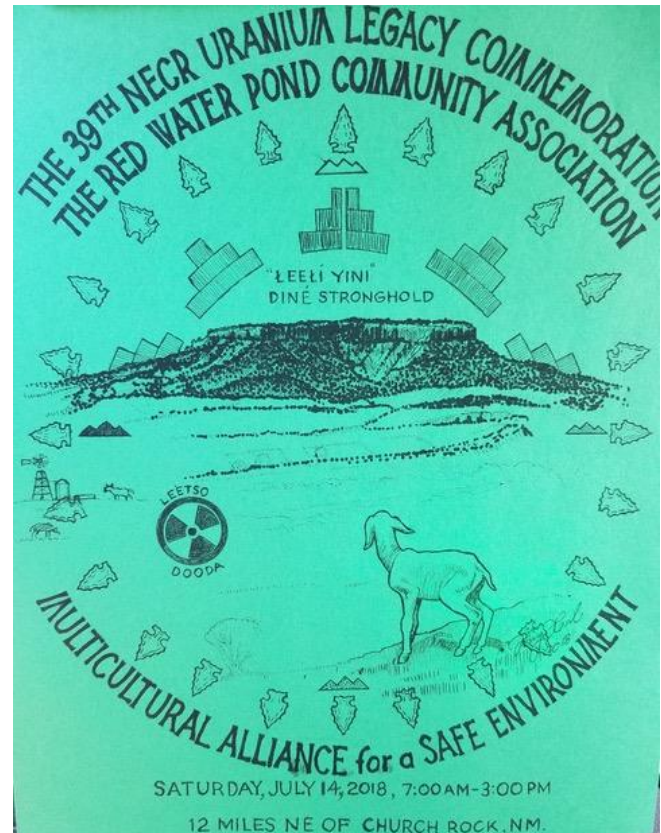
*Kevin Kamps, Radioactive Waste Specialist, Beyond Nuclear
Room HC-8, U.S. Capitol Building
Monday, July 16, 2018*

July 16 – a date that will live in infamy

**1945, Trinity atom bomb test
blast, near Socorro, NM**

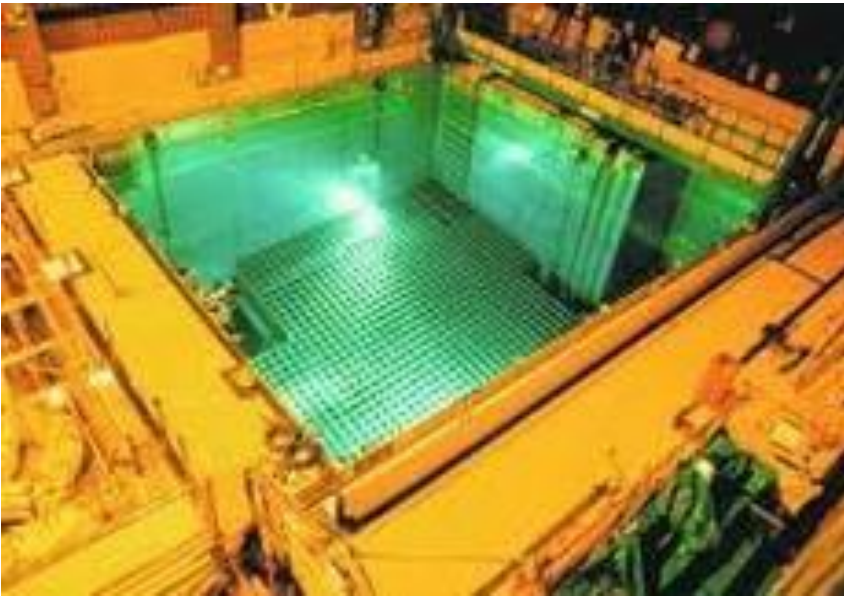


**1979, Church Rock uranium mill tailings
spill into Rio Puerco, near Gallup, NM**

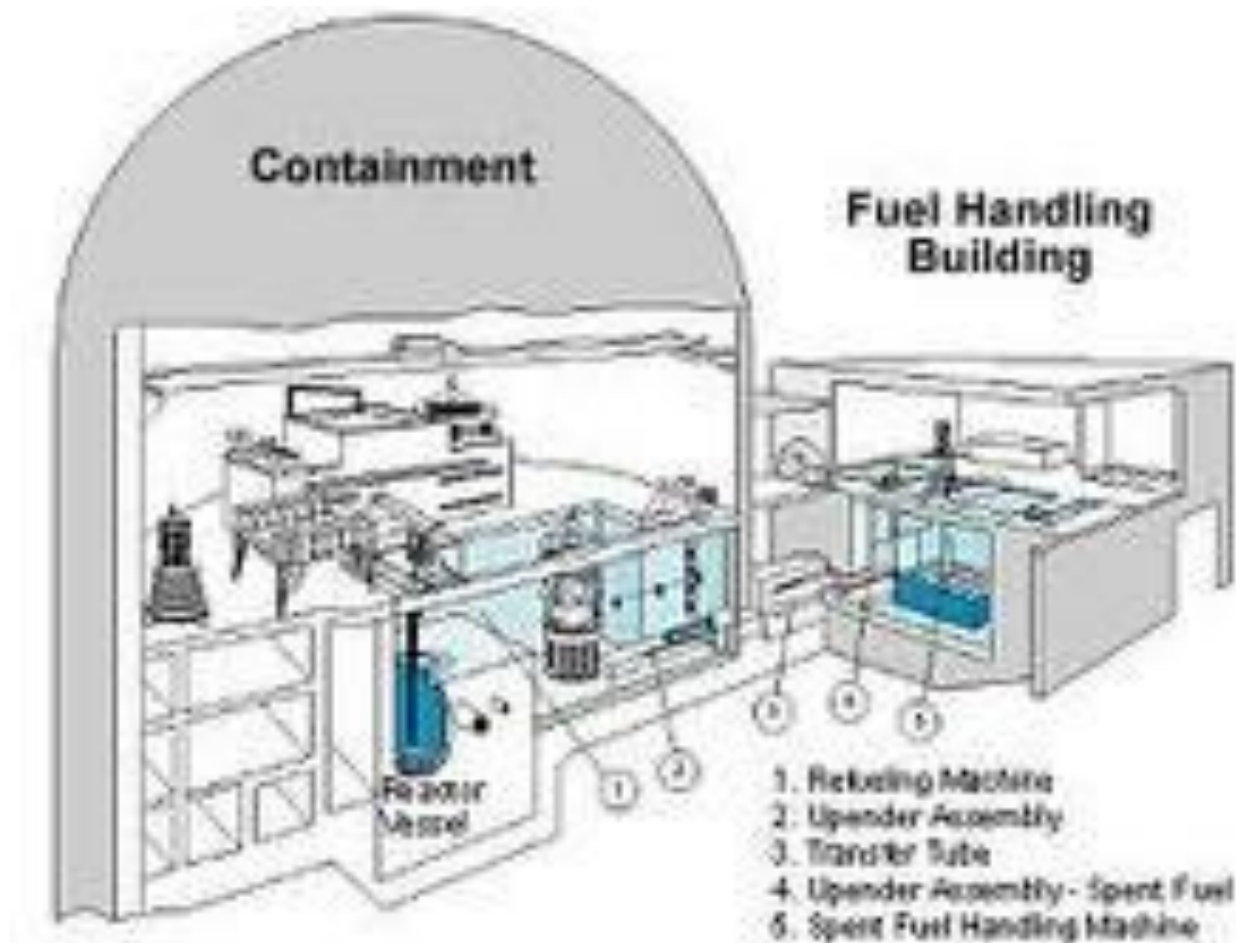


Irradiated Nuclear Fuel Transfer, from Pools to Casks

Indoor “Wet” Storage Pool → Outdoor Dry Casks



Pools are outside robust containment



Close call with catastrophe

Fukushima Daiichi Unit 4



**Japanese Prime Minister
Naoto Kan**



Risks of Pool Storage, Transfers

- IP's long term (~early 1990s-present) pool leakage of radioactivity into soil, groundwater, Hudson River (tritium, Sr-90, radioactive cesium, cobalt, nickel)
- Heavy load drop risk of pool drain down, zirconium fire (Prairie Island, MN & Palisades, MI transfer cask crane dangles; Vermont Yankee crane slip)

Crane Risks



Independent Spent Fuel Storage Installation (ISFSI) Configurations

Vertical

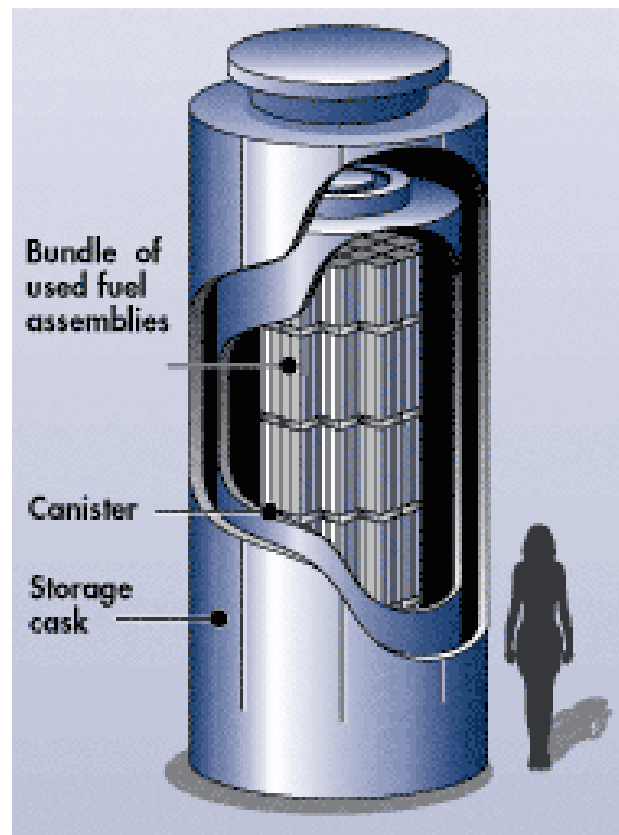


Horizontal

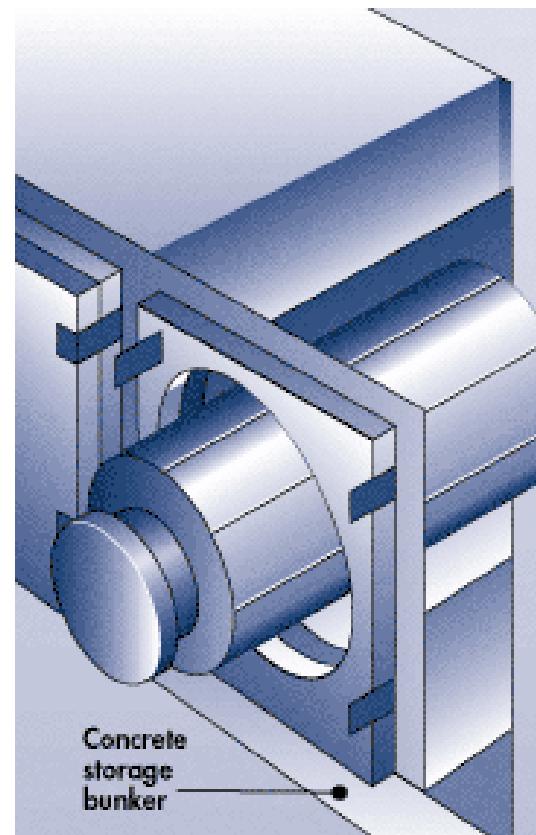


ISFSIs (Cask/Canister issues)

Vertical

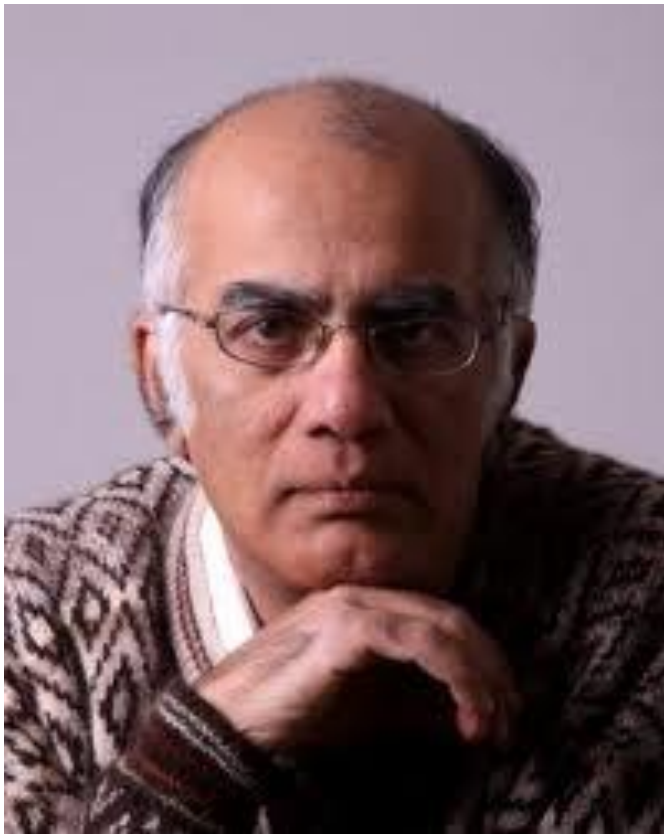


Horizontal



Need for Robust, or Hardened On-Site Storage (HOSS)

Dr. Arjun Makhijani, IEER



Dr. Gordon Thompson, IRSS



Statement of Principles for Safeguarding Nuclear Waste at Reactors (HOSS)—2006; 2010; 2016; 2018

- Require a low-density, open-frame layout for fuel pools (to provide convection air current cooling) – *that is, empty the pools as much, and as soon, as possible (a.k.a. “expedited transfer”)*;
- Establish hardened on-site storage (retrievability; real-time monitoring for radiation, temperature, pressure; as close as possible, as safely as possible, to point of generation);
- Protect fuel pools;
- Require periodic review of HOSS facilities and fuel pools;
- Dedicate funding to local and state governments to independently monitor the sites;
- Prohibit reprocessing (*something Holtec/ELEA wants to do at its CISF in southeastern NM*).

Statement of Principles for Safeguarding Nuclear Waste at Reactors (HOSS)—2006; 2010; 2016; 2018

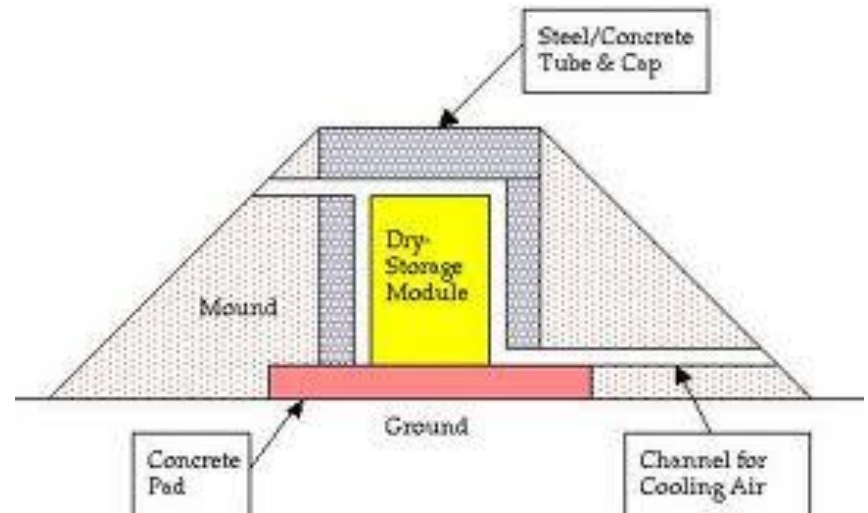
- http://ieer.org/wp/wp-content/uploads/2010/03/HOSS_PRINCIPLES_3-23-10x.pdf
- Many hundreds of public interest and environmental organizations, representing all 50 states, including from NY State:

Coalition on West Valley Nuclear Wastes; Center for Health, Environment, and Justice; For a Clean Tonawanda Site (FACTS); Citizen's Environmental Coalition; Riverkeeper; Central New York Citizens Awareness Network; IPSEC (Indian Point Safe Energy Coalition); Public Health and Sustainable Energy (PHASE); Council on Intelligent Energy & Conservation Policy (CIECP); Hudson River Sloop Clearwater.

Dispersed/Concealed HOSS v. Plain View/Clustered Configuration

“Bowling Pins”

Graphic from “Robust Storage” by
Dr. Gordon Thompson, Jan. 2003



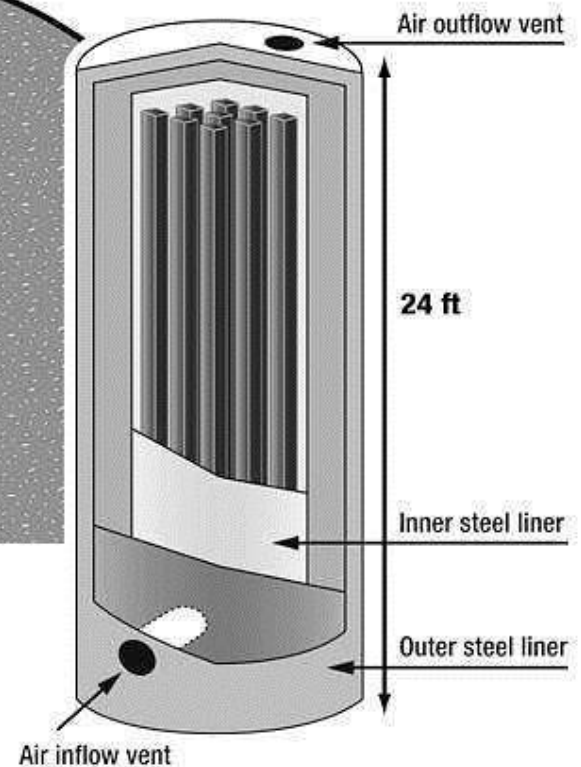
Schematic representation of HOSS

Earth/gravel berms should surround each cask and hide from ground-level view.



**Potential Target: 24 to 36
Bundles of Nuclear Rods**

Nuclear rods cooled by
simple air convection.



Cask/Canister Integrity (Or Lack Thereof)

Holtecs at D.C. Cook, MI

Quality Assurance violations



HOLTEC
INTERNATIONAL

Summary of Whistle-blower Allegations of Holtec QA Violations

- Faulty welds
- Unqualified fabrication materials
- Defective neutron shielding material
- Failure to perform coupon testing, Post-Weld Heat Treatment
- Bypassing of hundreds of non-conforming conditions, without re-analysis of structural integrity
- Improper, uncertified design decisions and changes on the fly
- No root cause investigation of epidemic of QA violations
- Interference with QA audit, falsification of QA documentation
- NRC incompetence, or worse—collusion, complicity

<<https://web.archive.org/web/20151020093217/http://www.nirs.org/radwaste//atreactorstorage/shiranialeg04.htm>>

Holtec Whistle-Blowers

Oscar Shirani, Commonwealth Edison/Exelon
QA inspector

- Shirani said Holtec casks are “nothing but garbage cans” if they are not made in accordance with government specifications;
- He questioned Holtec casks’ structural integrity sitting still, at 0 mph, let alone going 60 mph+ (accident forces) on the rails

Dr. Ross Landsman, NRC Region 3
dry cask storage inspector (retired)

- Has compared NRC/Holtec decision making to NASA’s, that led to “Space Shuttles hitting the ground”
- Will serve as environmental coalition expert witness in impending NRC licensing proceeding for Holtec/ELEA’s proposed CISF targeted at southeastern NM

Need for Emergency Cask-to-Cask Transfer Capability

- Urgent need to empty irradiated nuclear fuel from vulnerable and leaking storage pools into HOSS, ASAP, but...
- Essential to maintain operability of empty pool, in order to have cask-to-cask transfer capability, if and when needed
- Science fiction/fantasy of NRC's on-site or away-from-reactor "Dry Transfer Systems"

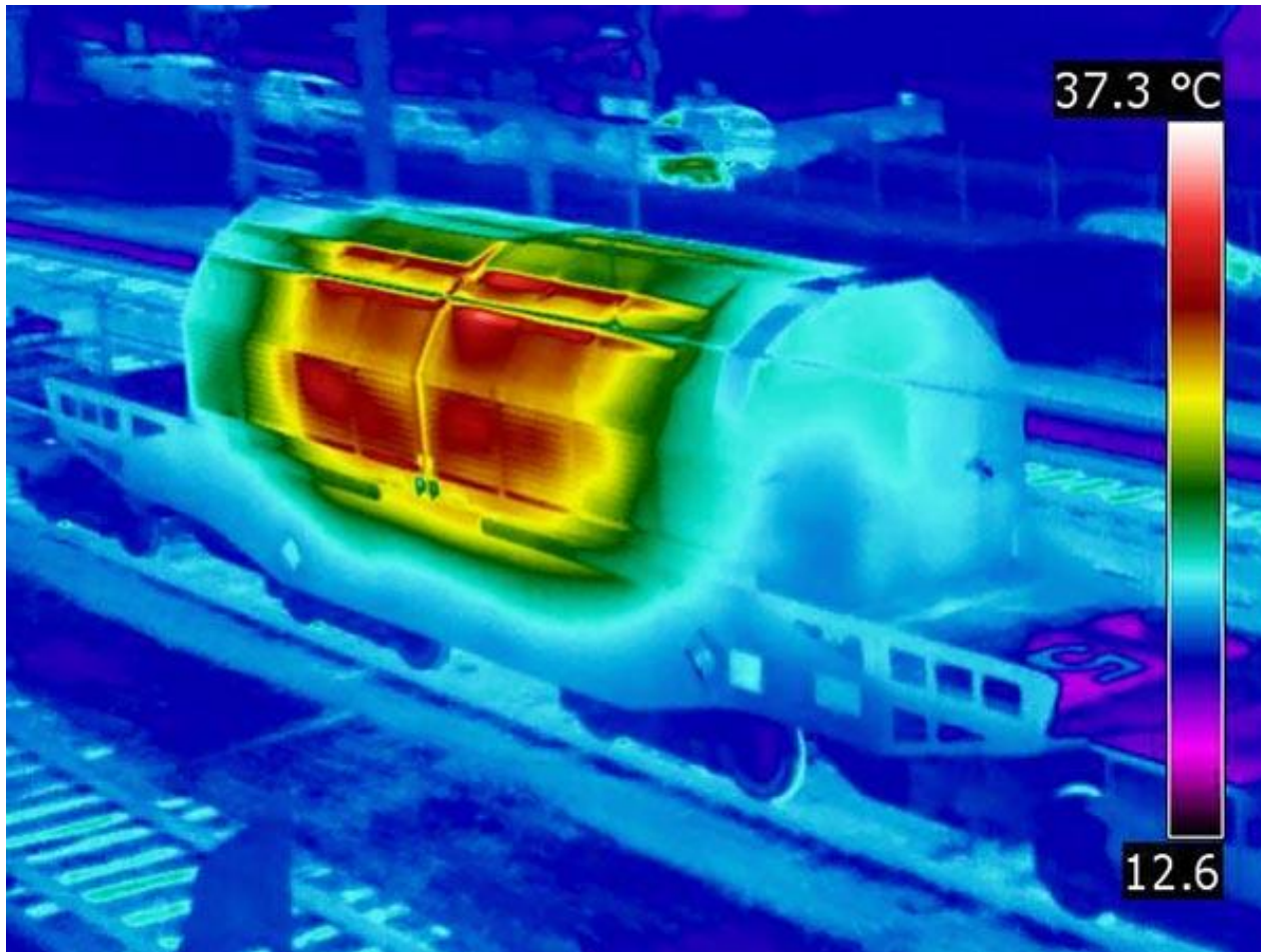
Risks of Off-Site Transport



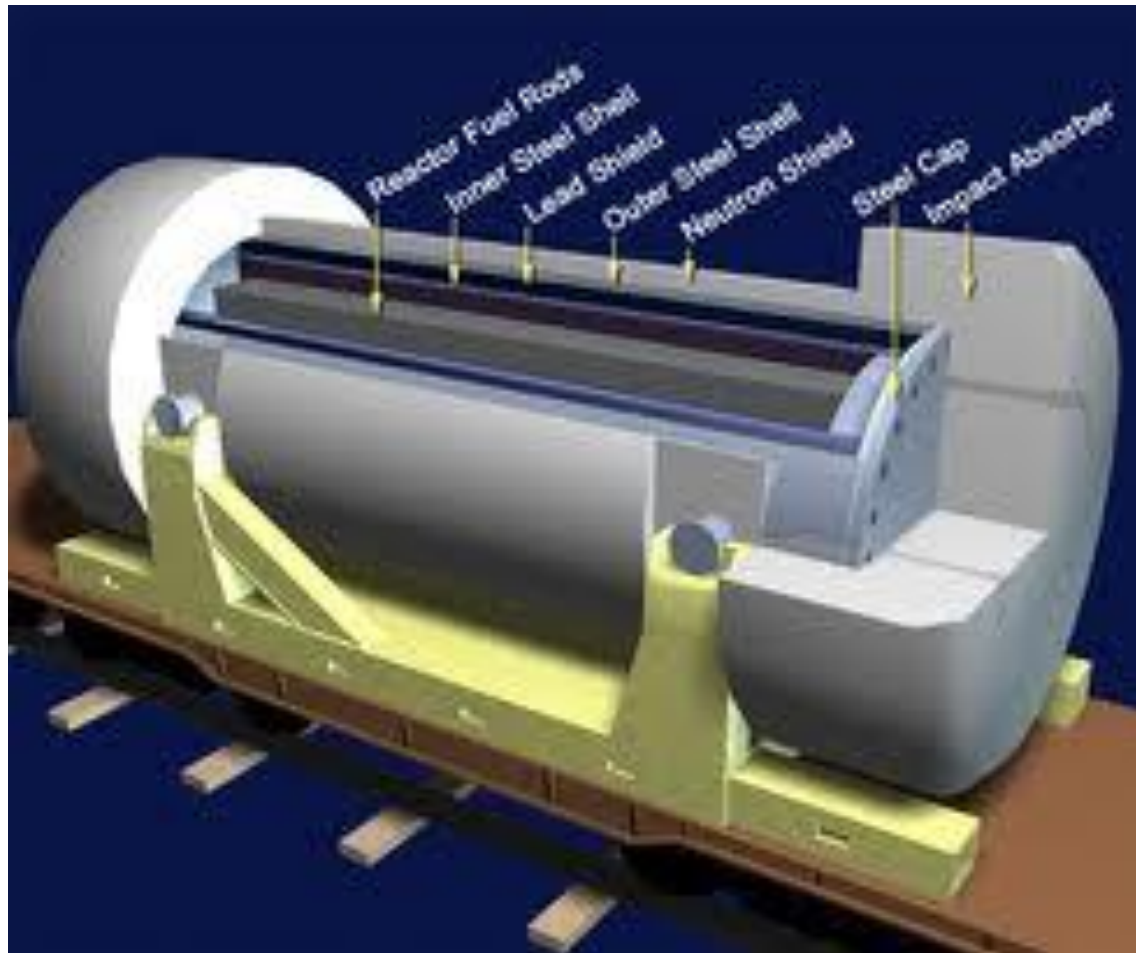
- Severe accidents
- Attacks
- Mobile X-Ray Machines That Can't Be Turned Off



High Burn-Up makes everything worse
(thermal heat, radioactivity)



Shipping Cask/Canister issues





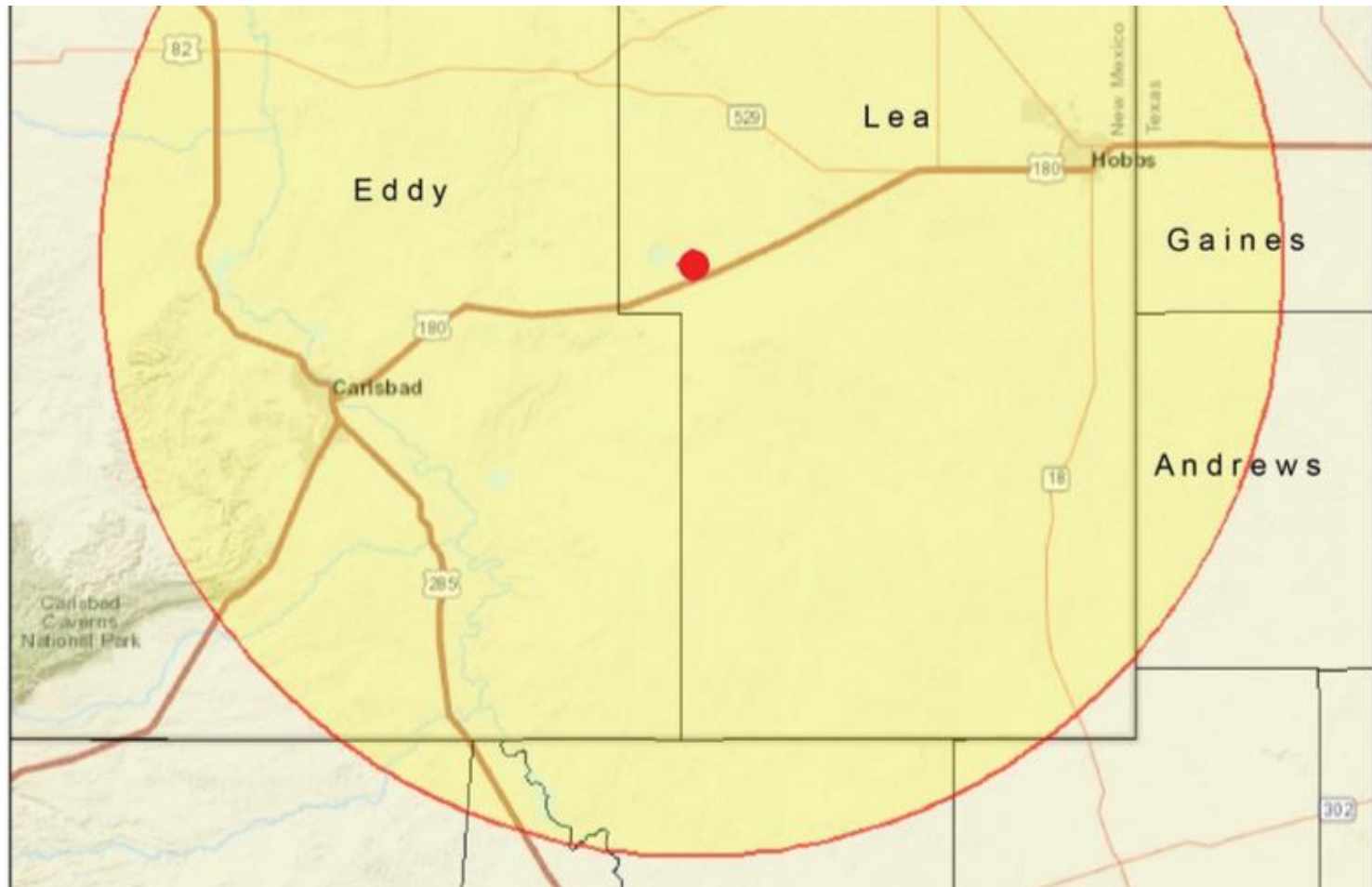
Consolidated Interim Storage Facilities

**Waste Control Specialists, LLC,
Andrews County, Texas (WCS)**

**Eddy-Lea [Counties] Energy
Alliance, New Mexico (ELEA)**



The two proposed CISFs are less than 40 miles apart (Nuclear Sacrifice Zone)



CIS: De Facto Permanent Surface Storage Parking Lot Dump, or else Multiplying Transport Risks



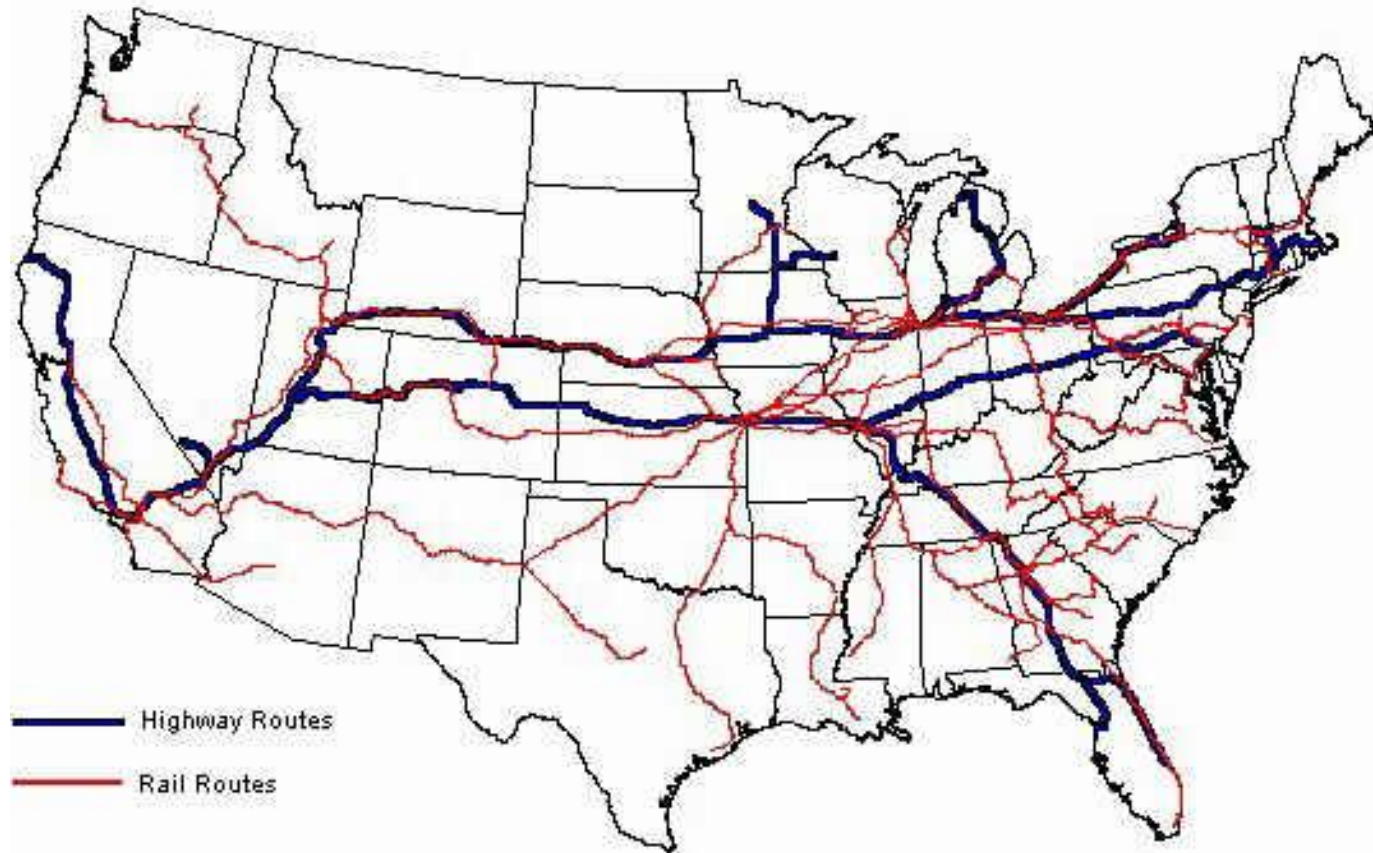
"Just Keep Driving around - We may
come up with a solution yet!"

Yucca Mountain, Nevada; Geologic Repository (Permanent Burial)



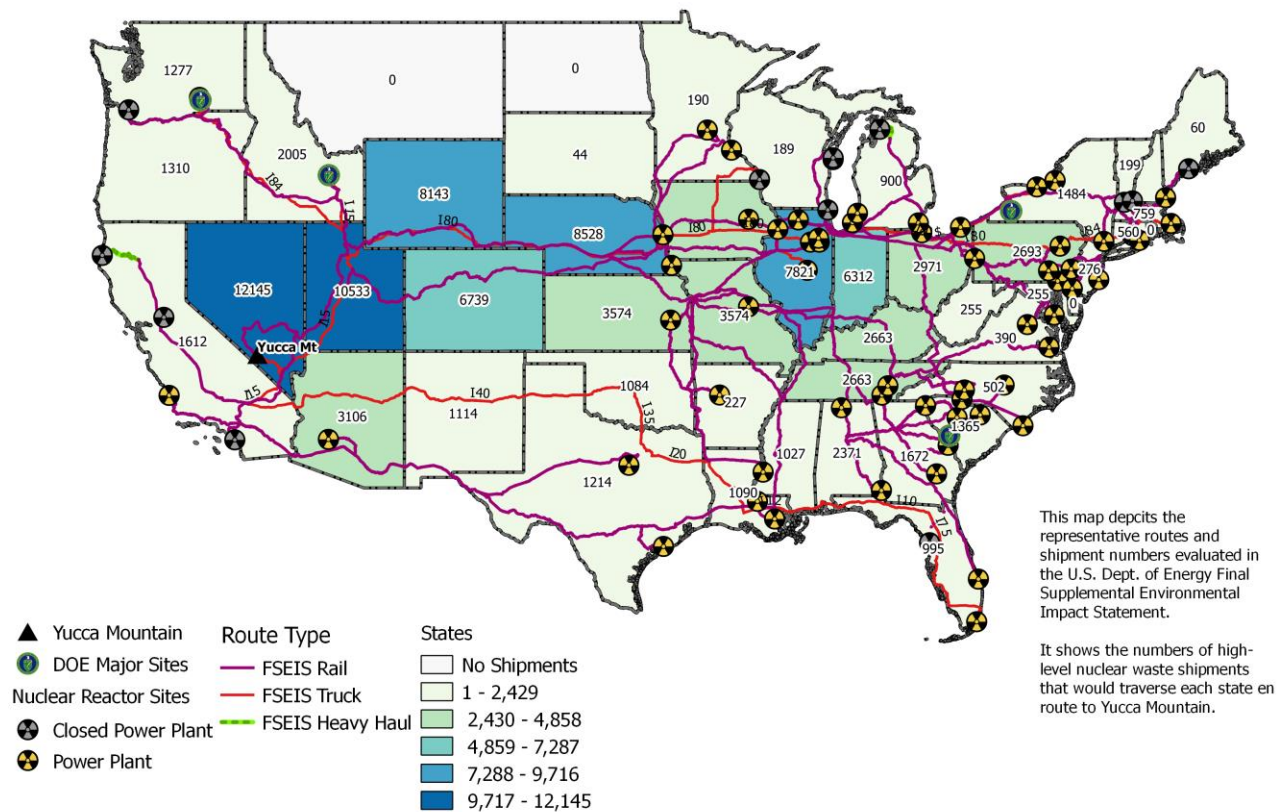
Routes: Yucca Mountain, NV-bound

Nuclear Waste Shipment Routes



Yucca-bound routes

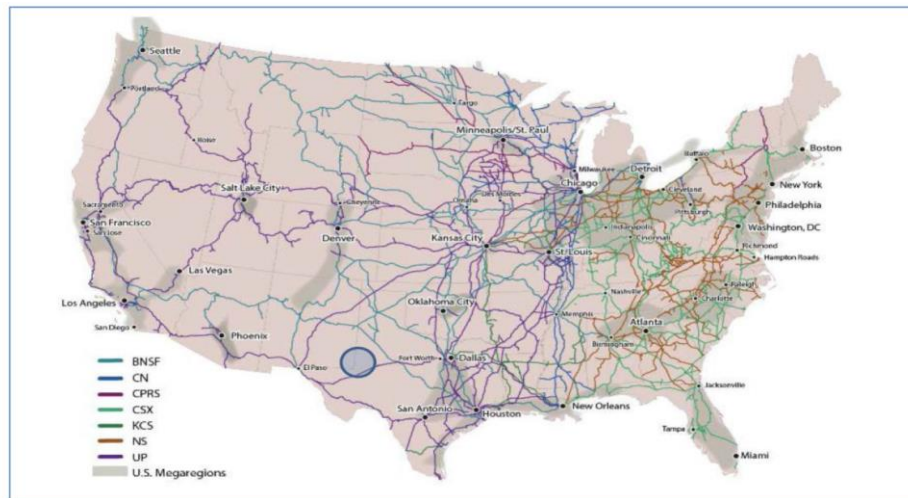
**Representative Transportation Routes to Yucca Mountain
and Transportation Impacts (Cask Shipments by State)**




WCS, TX-bound routes

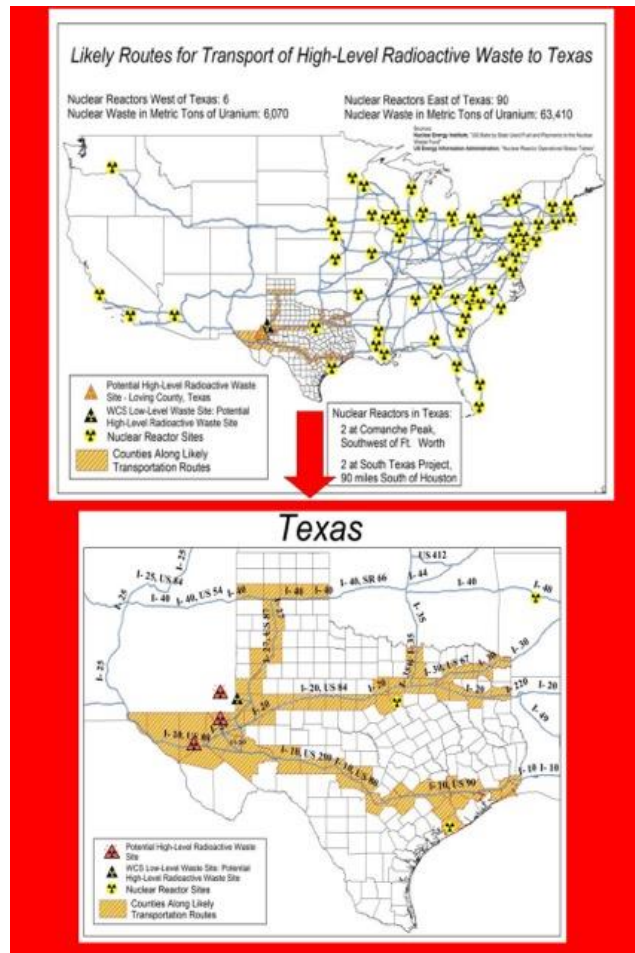
WASTE CONTROL SPECIALISTS LLC
ENVIRONMENTAL REPORT

CHAPTER 2



Title: RAIL LINES MAP	Figure: 2.2-4	Date: 11/16/2015 Scale: NONE	 ANDREWS, TEXAS
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WCS, TX-bound routes



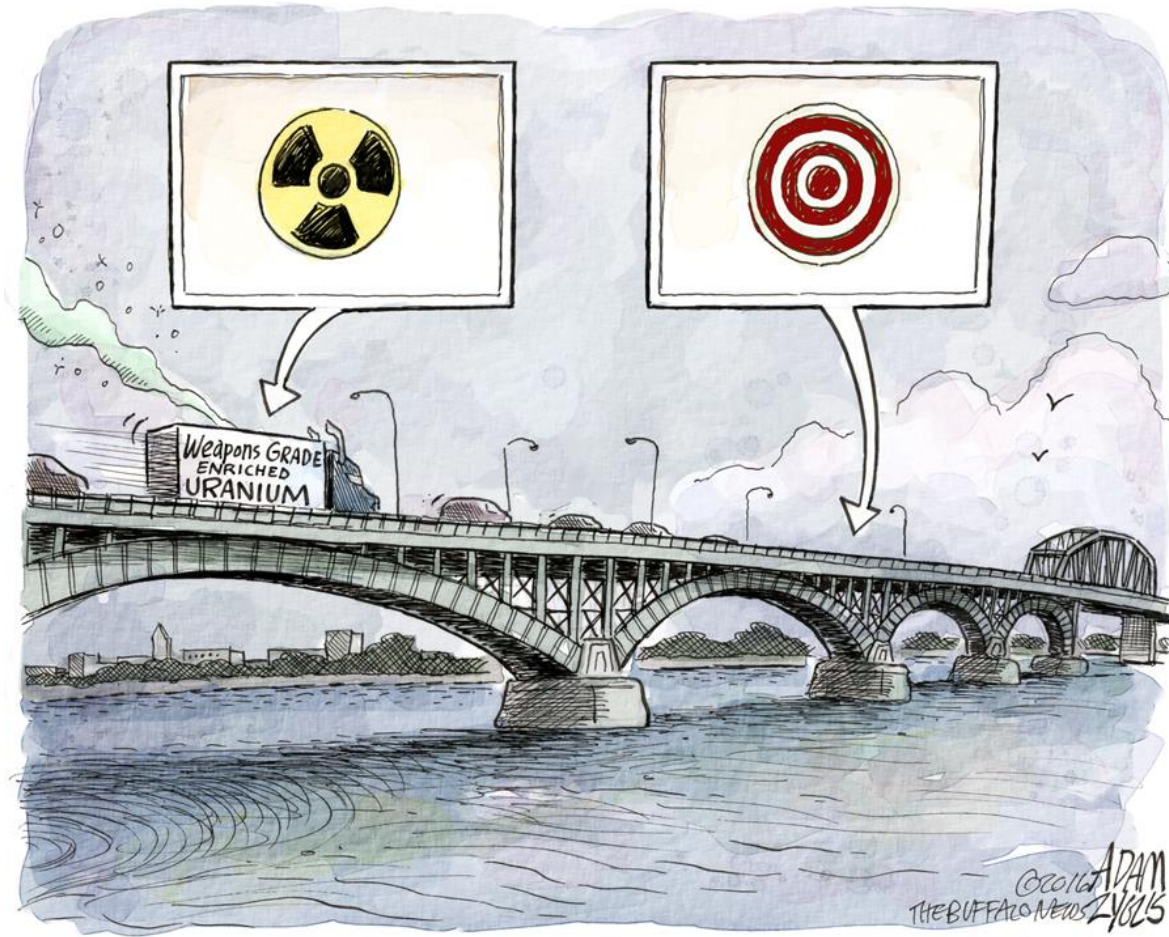
Holtec/ELEA, NM-bound routes (including exports to Yucca)



Figure 4.9.1: TRANSPORTATION ROUTES FOR SNF

HOLTEC INTERNATIONAL COPYRIGHTED MATERIAL		
HI-2167521		Rev. 0
4-40		

Highly Radioactive LIQUID Waste Truck Shipments?! (DOE is out of control)



Highly Radioactive Liquid Waste Truck Shipments

A long haul

Highly radioactive material is being shipped from Chalk River to a reprocessing facility in South Carolina. Though the route is secret, it will also be long. The most direct route shown on the map is almost 1,900 kilometres.

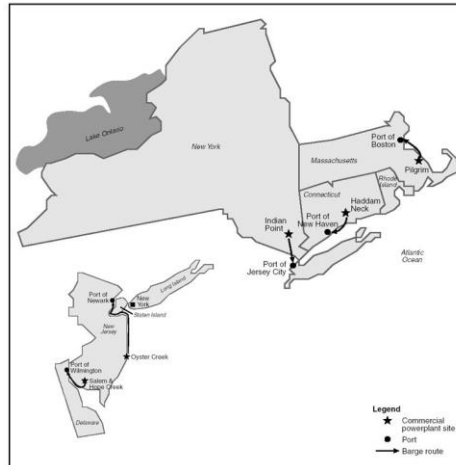


DENNIS LEUNG/OTTAWA CITIZEN

Barge Shipments

Barge Shipments of High-Level Radioactive Waste on the Waters of NJ, NY, and CT Surrounding New York City

Proposed by U.S. Dept. of Energy under its Yucca Mountain Plan



Map taken from Figure J-9, Routes analyzed for barge transportation from sites to nearby railheads, page J-78 and J-81.

Nuclear Reactor	Location	# of Shipments Proposed	Barges offloaded at:
Oyster Creek	Forked River, NJ	Up to 111, along NJ shore	Port of Newark, NJ
Indian Point	Buchanan, NY	Up to 58, down Hudson River	Port of Jersey City, NJ
CT Yankee	Haddam Neck, CT	Up to 42, on Long Is. Sound	Port of New Haven, CT

Total Up to 211

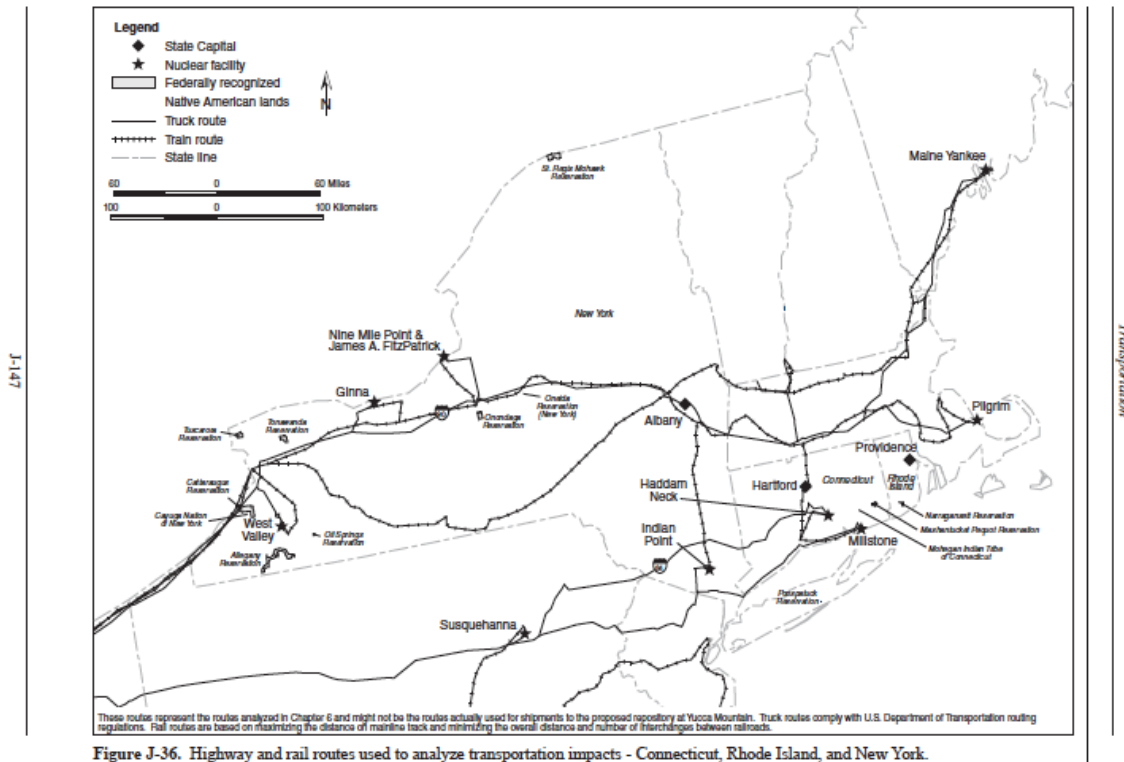
Table taken from Table J-27, Barge shipments and ports, page J-83.

Map and table taken from U.S. Department of Energy, "Final Environmental Impact Statement for Yucca Mountain," Appendix J ("Transportation"), Feb. 2002.

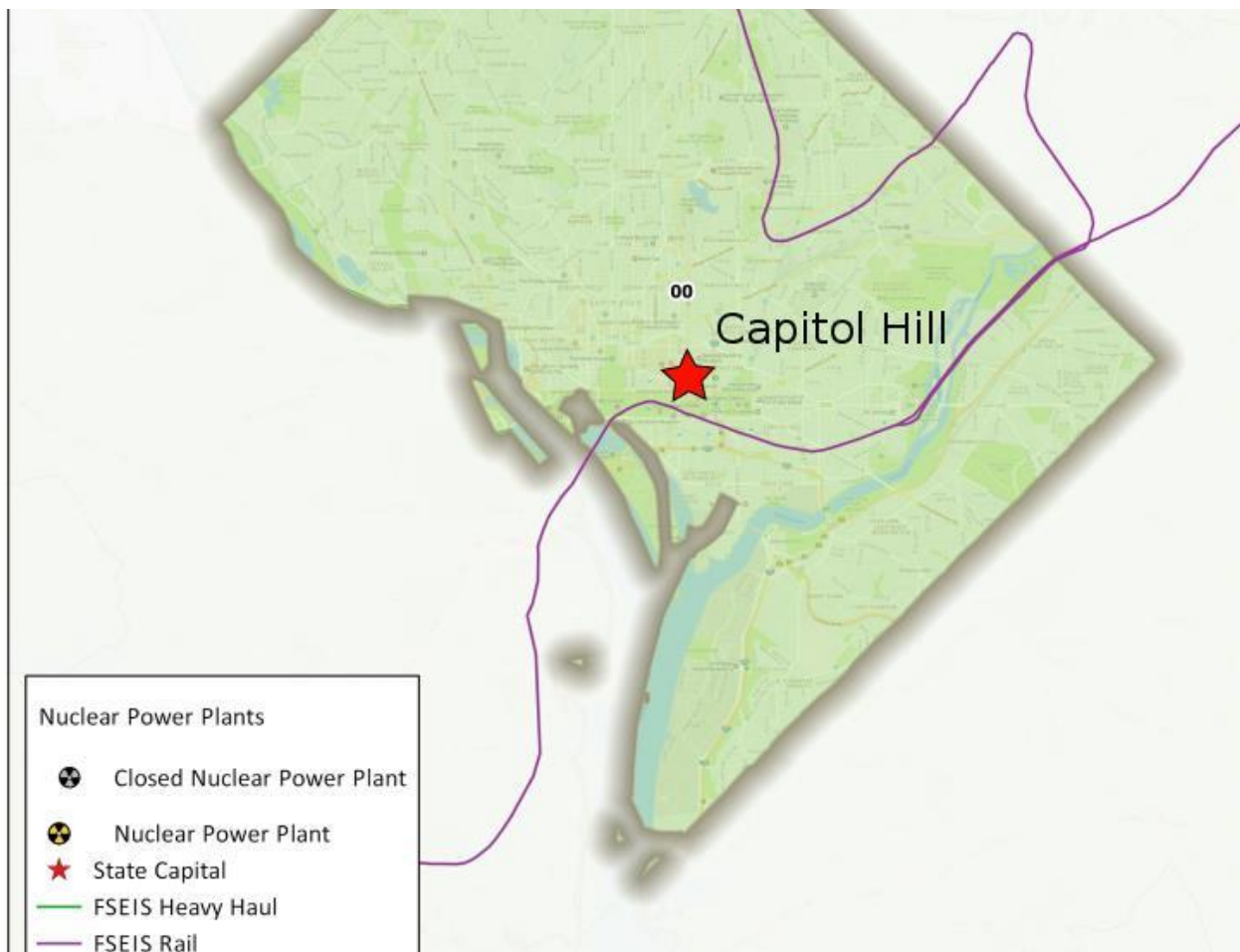
Road and Rail Routes

Main Index

Vol 2 Index



Road and Rail Routes





Road and Rail Routes (Yucca-bound)

- http://www.state.nv.us/nucwaste/news2017/pdf/States_Affected.pdf [44 states]
- http://www.state.nv.us/nucwaste/news2017/pdf/Cities_Affected.pdf [scores of major cities]
- <http://www.state.nv.us/nucwaste/news2017/115th%20Congressional%20Districts%207252017.pdf> [330 of 435]

Or Heavy-Haul Truck?



Transport Risk: Underwater Submersion



Transport Risk: High-Temperature, Long-Duration Fire



Transport Risk: Attack



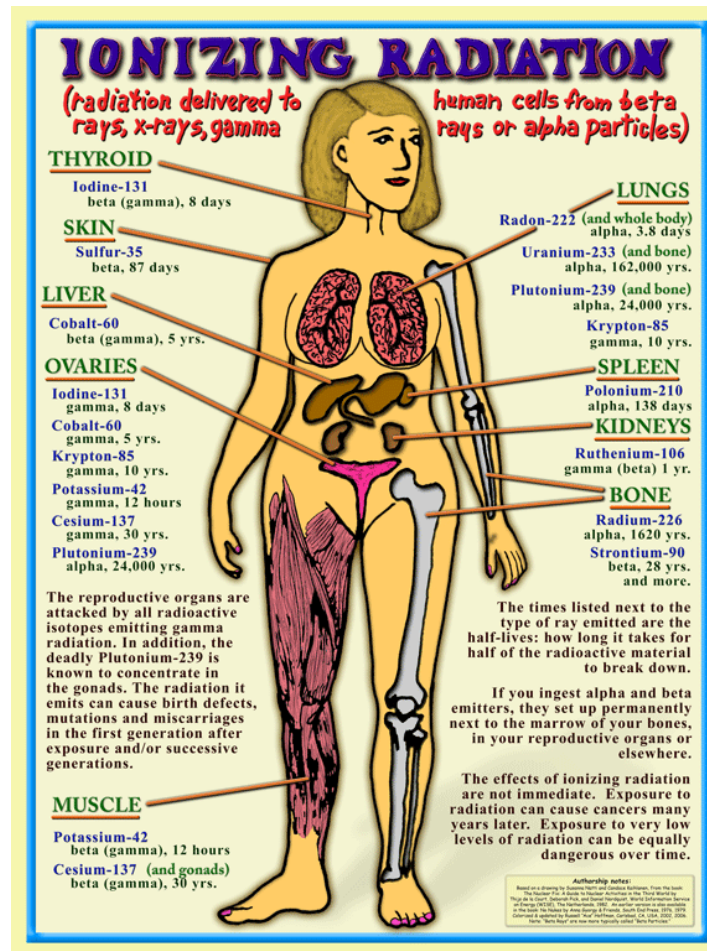
Transport Risk: Attack



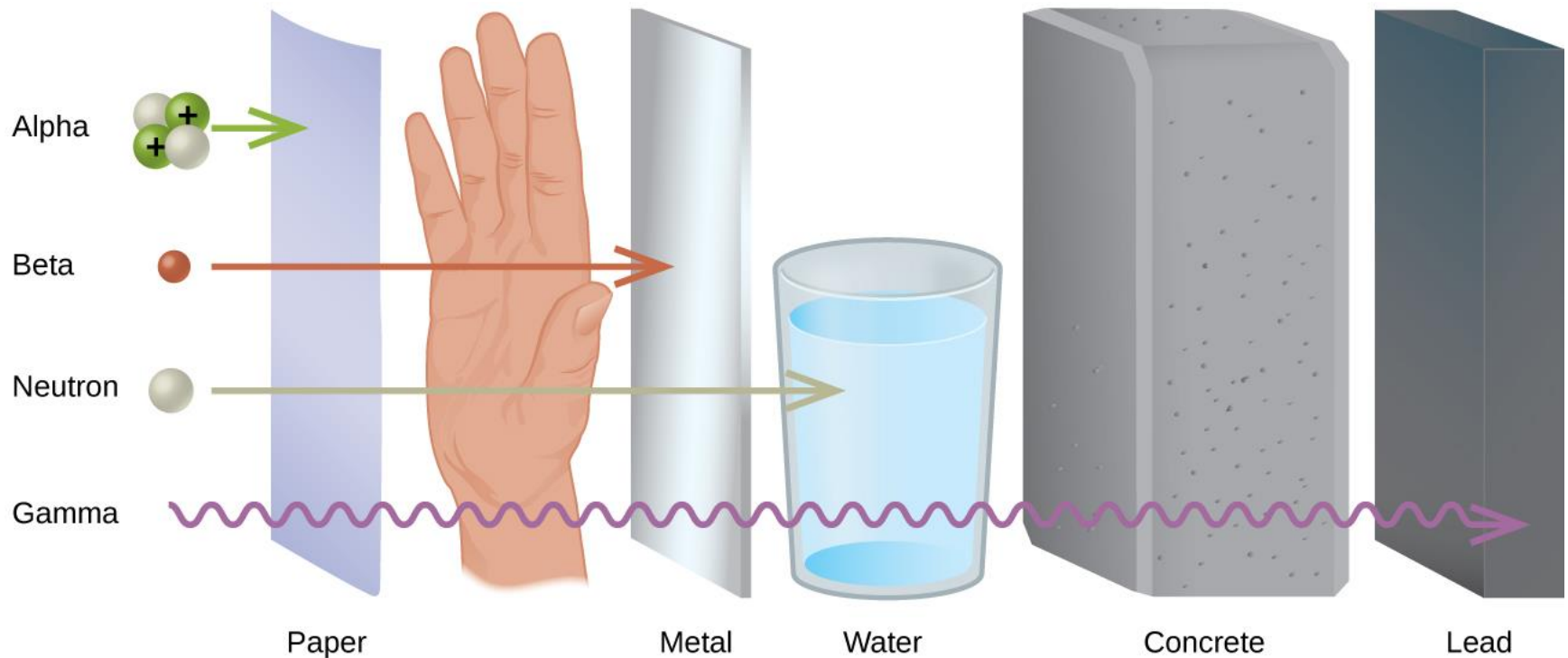
Transport Risk: Attack



Where the Radioactive Poisons Go



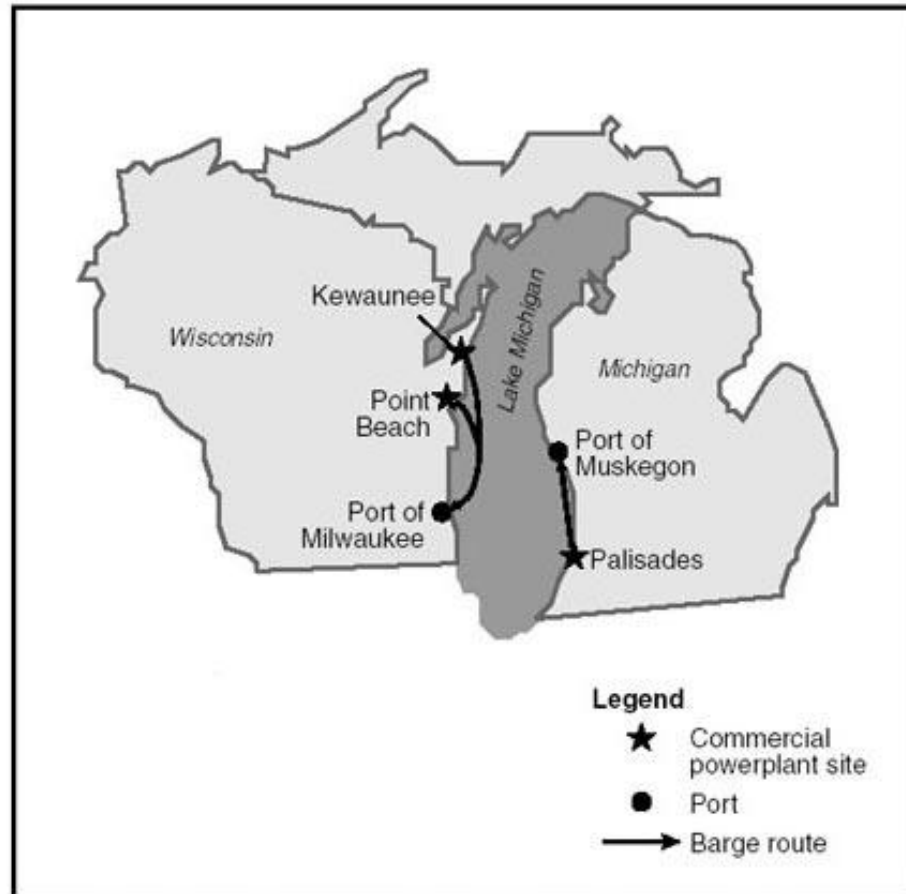
“Routine” or “Incident-Free” Shipments: Mobile X-Ray Machines That Can’t Be Turned Off



H.R. 3053



Lake Michigan barge shipments



IL road and rail routes

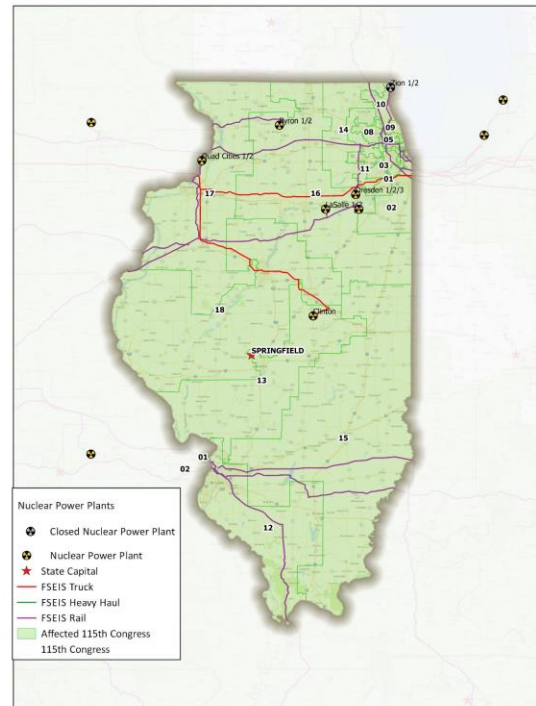
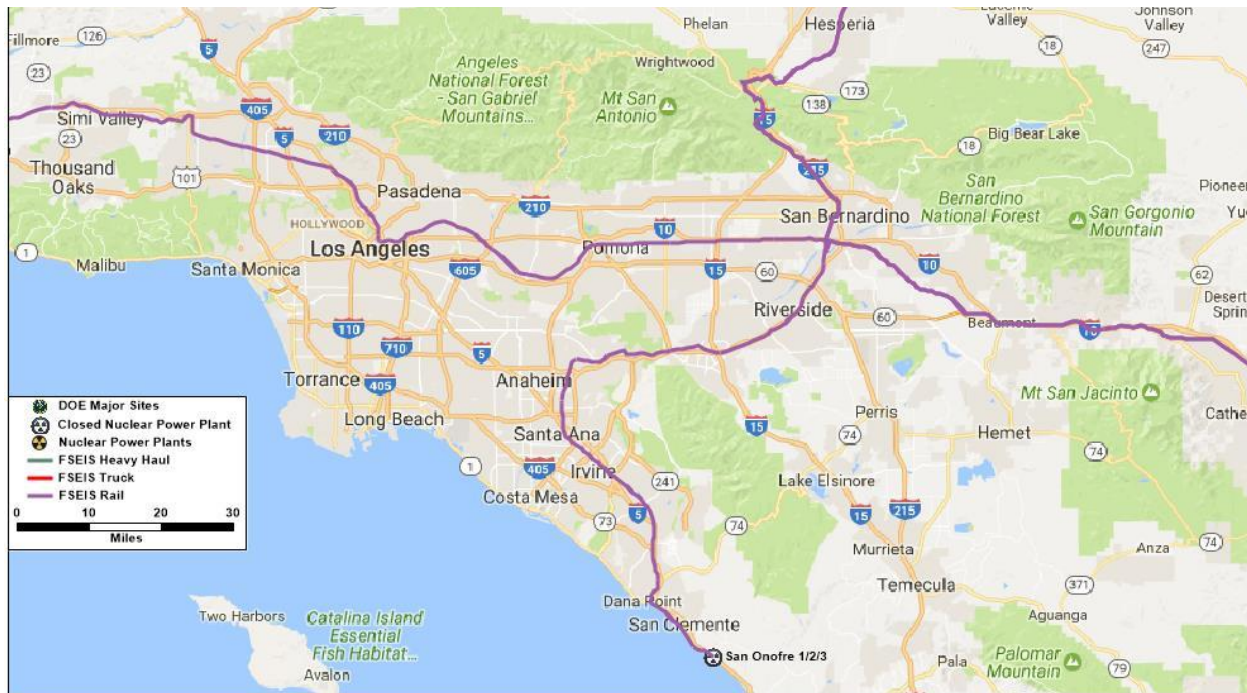


Figure 11 FSEIS Routes through Illinois

Senate E&W Appropriations



LA road and rail routes



We Do NOT Consent!



