

Congressional Briefing on Nuclear Risks to Lake Michigan

Kevin Kamps

Beyond Nuclear & Don't Waste Michigan

April 7, 2021

GREAT LAKES REGION NUCLEAR HOT SPOTS

PROPOSED SITES FOR A DEEP GEOLOGICAL REPOSITORY FOR CANADA'S NUCLEAR FUEL WASTE

COMMUNITIES Under Consideration

1. English River	11. Blind River
2. First Nation	12. Elliot Lake
3. Pinehouse	13. North Shore
4. Creighton	14. Spanish
5. Bar Falls	15. Arsen-Elderslie
6. Ignace	16. Sauguen Shores
7. Nepean	17. Brockton
8. Schreiber	18. Huron-Elderslie
9. Homebyme	19. South Bruce
10. White River	20. Muntonowadje
11. Wawa	21. Central Huron
	22.
	23.

As of April 2013

Sources: Nuclear Waste Management Org. & Northwatch

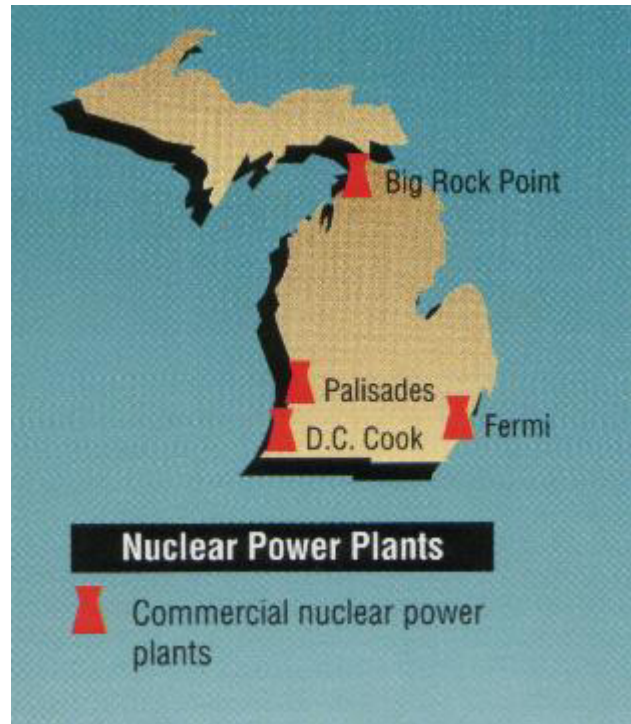


LEGEND ONLY FACILITIES SPECIFICALLY RELATED TO NUCLEAR POWER GENERATION ARE ON THIS MAP

- Uranium Mining and Mill Tailings
- Operating Nuclear Power Reactors*
- Closed Nuclear Power Reactors*
- Nuclear Fuel Waste
- Low-and/or Intermediate-Level Radioactive Waste (L&ILRW) Sites**
- Deep Geological Repository (DGR)
- Incinerator
- Uranium Processing & Fuel Fabrication

*Number in brackets indicates the number of reactors. **These wastes are also stored at all nuclear power reactor sites.

www.concernforhealth.org • www.glu.org Original production by Irene Kock, 1990-91, Nuclear Awareness Project. Updated by Anna Tilman, April 2013, IICPH. Funded by the Citizens' Clearinghouse on Waste Management.



Palisades atomic reactor

Covert Township, Van Buren County, MI



Big Rock Point nuclear power plant site

Hayes Twp., Charlevoix County, MI



Cook Nuclear Power Plant, Units 1 & 2

Bridgman, Berrien County, MI



Risks at Palisades

- (1.) 14 more months of very high risk operations at this 50-year old reactor
- (2.) Holtec's proposed takeover for decommissioning and high-level radioactive waste management purposes
- (3.) Vulnerability to record high Lake Michigan water levels, as well as extreme weather due to climate instability

(1.) 14 more months of very high risk operations at this 50-year old reactor

(a.) Safety-significant systems, structures, and components long overdue for repair or replacement: **embrittled reactor pressure vessel**; degraded reactor lid; degraded steam generators; flawed control rod drive mechanisms

(b.) Infamous security breaches and failures

(c.) Need for just transition for workforce and host municipalities

The Palisades Nuclear Power Plant

Highlights of Palisades include:

- Commenced commercial operation in 1971; current NRC operating license expires in 2011.
- License renewal application filed in March 2005; license renewal, anticipated early 2007, would extend the license to 2031.
- Qualified workforce of approximately 470 persons.
- Currently operated on behalf of Consumers by the Nuclear Management Company (NMC).
- Required significant future capital expenditures required above the routine \$20M per year, including:
 - Reactor vessel head replacement \$100 million
 - Steam generator replacement 1991 NRC fee \$ millions
 - Reactor vessel embrittlement concerns
 - Increasing NRC fees and fire protection requirements
 - Containment coatings and sump strainers

Davis-Besse, Ohio reactor lid near-miss, 2002



Red Rusty Boric Acid Deposits on Vessel Flange (12RFO)

No steam generator replacement

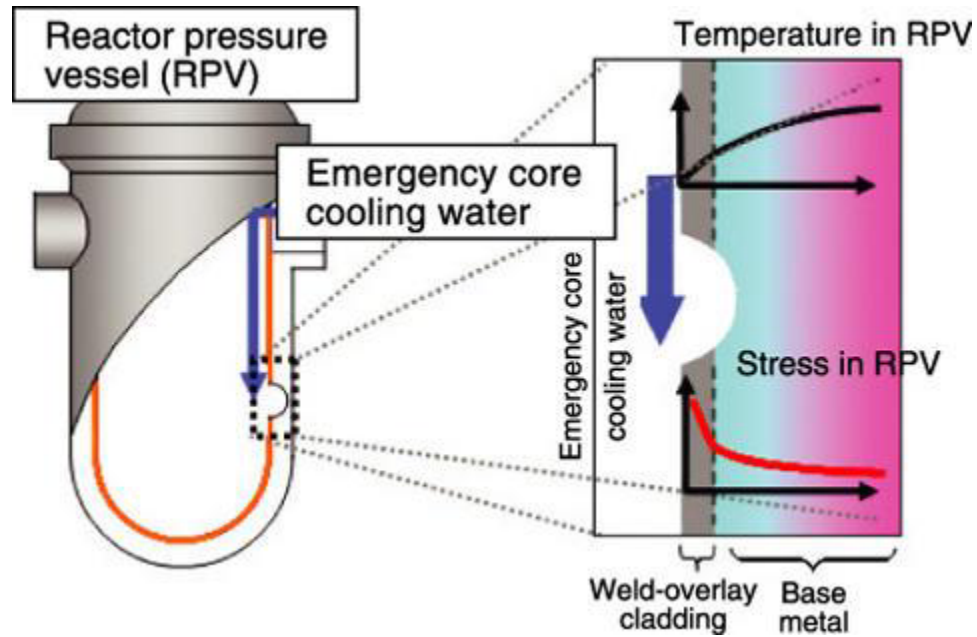


Palisades' CRDM failures (1972-present)



Nuclear Regulatory Commission seal of approval

Neutron embrittlement of the reactor pressure vessel



Risks of Pressurized Thermal Shock

- Through-Wall Fracture of Reactor Pressure Vessel
- Loss of Coolant Accident in the operating reactor core
- Failure of containment, as at Fukushima Daiichi, Japan
- Catastrophic release of hazardous radioactivity over a large region



Arnie Gundersen, Fairewinds Energy Education:
“Nuclear Crack Down” & “Downstream”





Copyright © and (P) 1999-2006 Microsoft Corporation and/or its suppliers. All rights reserved.

CRAC-II meltdown estimates for casualties/property damage

CRAC-II is both a computer code (titled **Calculation of Reactor Accident Consequences**) and the 1982 report of the simulation results performed by [Sandia National Laboratories](#) for the [Nuclear Regulatory Commission](#). The report is sometimes referred to as the CRAC-II report because it is the computer program used in the calculations, but the report is also known as the 1982 Sandia Siting Study or as NUREG/CR-2239.

Peak Early Fatalities (Acute Radiation Poisoning Deaths): 1,000

Peak Early (Radiation) Injuries: 7,000

Peak Cancer Deaths (Latent Cancer Fatalities): 10,000

Property Damage in 1982 Dollar Figures: \$52.6 billion

But as AP's Jeff Donn reported in 2011 in the four-part investigative series "Aging Nukes," populations have soared around Palisades in the past 40 years, so casualty figures would be significantly higher now. And just adjusting for inflation alone, not even accounting for economic development over the past four decades, property damage would now surmount **\$143 billion**.

SAFETY RECOMMENDATIONS

---Any remaining capsule(s) at Palisades should be tested immediately to **verify** **NRC and industry assumptions** about current PTS risk levels of Palisades' RPV

---As with reactor degradation of the reactor lid, steam generators, CRDMs, and any other safety-significant Systems, Structures, and Components, if thorough inspections show Palisades is unsafe to operate, it should close immediately

---Comprehensive "autopsy" of Palisades' RPV should be performed post-closure, and lessons learned applied at Point Beach, WI, and other Pressurized Water Reactors

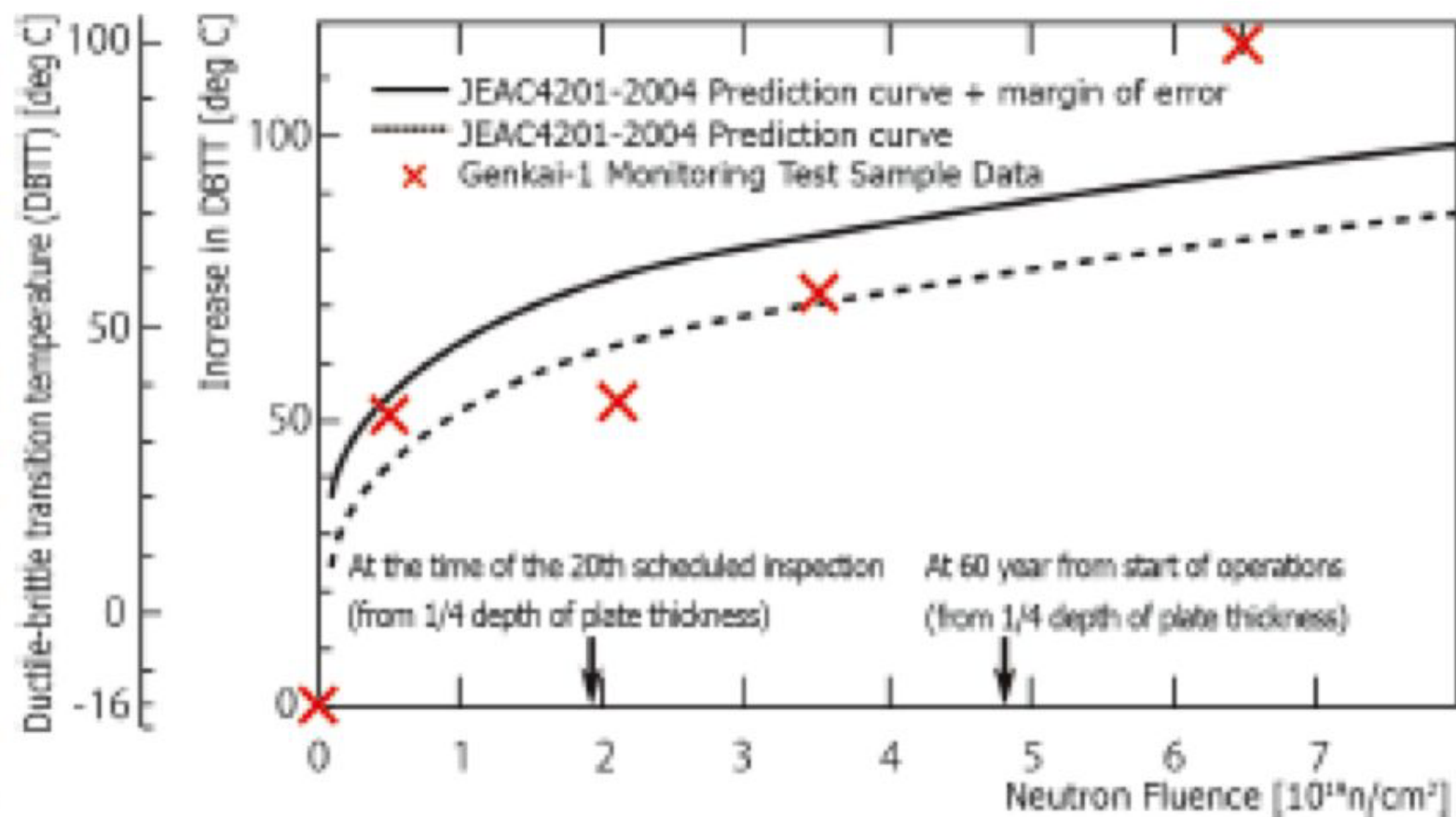


Figure 1.
 Genkai-1 Monitoring Test Sample Data and JEAC 4201-2004 Prediction Curve

Security Risks, even during decommissioning phase



Entergy security failures

Cyber Security

Physical Security

---Project on Government Oversight (POGO), "Nuclear Power Plant Security: Voices from Inside the Fences," September 12, 2002

---"Mercenary," *Esquire*, May 15, 2007

---"Burning Down the House on Nuclear Regulations: Palisades Lessons NOT Learned from Entergy's Prior Fire Safety and Security Violations," July 14, 2016

---Michigan state law granting immunity from prosecution to Palisades security guards for wrongful killing of unsuspecting recreational tourists, along a state-designated boating beach adjacent to state park







**WARNING
PRIVATE PROPERTY**
THIS AREA PATROLLED BY
AN ARMED SECURITY FORCE.
TRESPASSERS WILL
BE PROSECUTED

Just Transition

---Retain workforce for decommissioning radiological cleanup phase, including high-level radioactive waste (irradiated nuclear fuel) management

---Provide revenues for local host municipalities, including Covert Twp. and Van Buren County School District (for example, the STRANDED Act)

(2.) Stop Holtec's proposed takeover of Palisades & Big Rock Point

- (a.) Block authorization and appropriations legislation that would open the Yucca Mountain permanent dump-site on Western Shoshone land in Nevada, and/or Consolidated Interim Storage Facilities (CISFs) in New Mexico and Texas
- (b.) Prevent looting of Palisades' Nuclear Decommissioning Trust Fund for non-decommissioning expenses
- (c.) Enforce emergency response and preparedness regulations throughout decommissioning phase, in regard to irradiated nuclear fuel risks

Why block CISFs? EJ, Consent-Based Siting, etc.



Up to 453 high-risk barge shipments of highly radioactive waste on Lake Michigan

---Up to 125 barge shipments from Palisades to Port of Muskegon

---Up to 111 barge shipments from Kewaunee, WI to Port of Milwaukee

---Up to 217 barge shipments from Point Beach, WI to Port of Milwaukee

See: Figure J-9, Routes analyzed for barge transportation from sites to nearby railheads, page J-80; and Table J-27, Barge shipments and ports, page J-83. Map and table in U.S. Department of Energy, “Final Environmental Impact Statement for Yucca Mountain,” Appendix J (“Transportation”), Feb. 2002.



Heavy-Haul Truck



Train



Block the looting of Palisades' NDTF

---Palisades' \$552 million NDTF is already woefully inadequate, after the \$316 million raid by Consumers Energy and Entergy in 2007

---Holtec has applied to NRC to drain \$166,121,699 for "Spent Fuel" management expenses

---Holtec has applied to NRC to drain another \$34,678,590

See: Holtec's "Palisades Nuclear Plant Site-Specific Decommissioning Cost Estimate," Dec. 23, 2020, Pages 28-29

Every dollar of the NDTF spent on non-radiological clean up expenses means that much more radioactive contamination left behind at the Palisades site.



**WARNING:
UNCONTROLLED
RADIOACTIVE
RELEASES**

**BURIED BELOW IS A TANGLE
OF CORRODED PIPES
UNINSPECTED FOR DECADES
NOW LEAKING
RADIOACTIVE WATER**

A Beyond Nuclear Report

Significant, hazardous radioactive and toxic chemical contamination of the Palisades site

---Tritium leaks and spills, including into the Control Room

---Flooding of Rad Waste Building

---Hydrazine leakage

---Asbestos

---Lake Michigan is the drinking water supply for South Haven and countless additional Lake Michigan shoreline communities, including Chicago; site aquifers could contaminate adjacent drinking water wells, such as at Palisades Park Community

Feb. 24, 2021 legal interventions against Holtec takeover

---Beyond Nuclear, Don't Waste Michigan, and Michigan Safe Energy Future (legal counsel Terry Lodge of Toledo, OH; expert witness Robert Alvarez of Institute for Policy Studies in Washington, D.C., former senior advisor to the U.S. Energy Secretary)

---The Office of State of Michigan Attorney General Dana Nessel

---Environmental Law and Policy Center

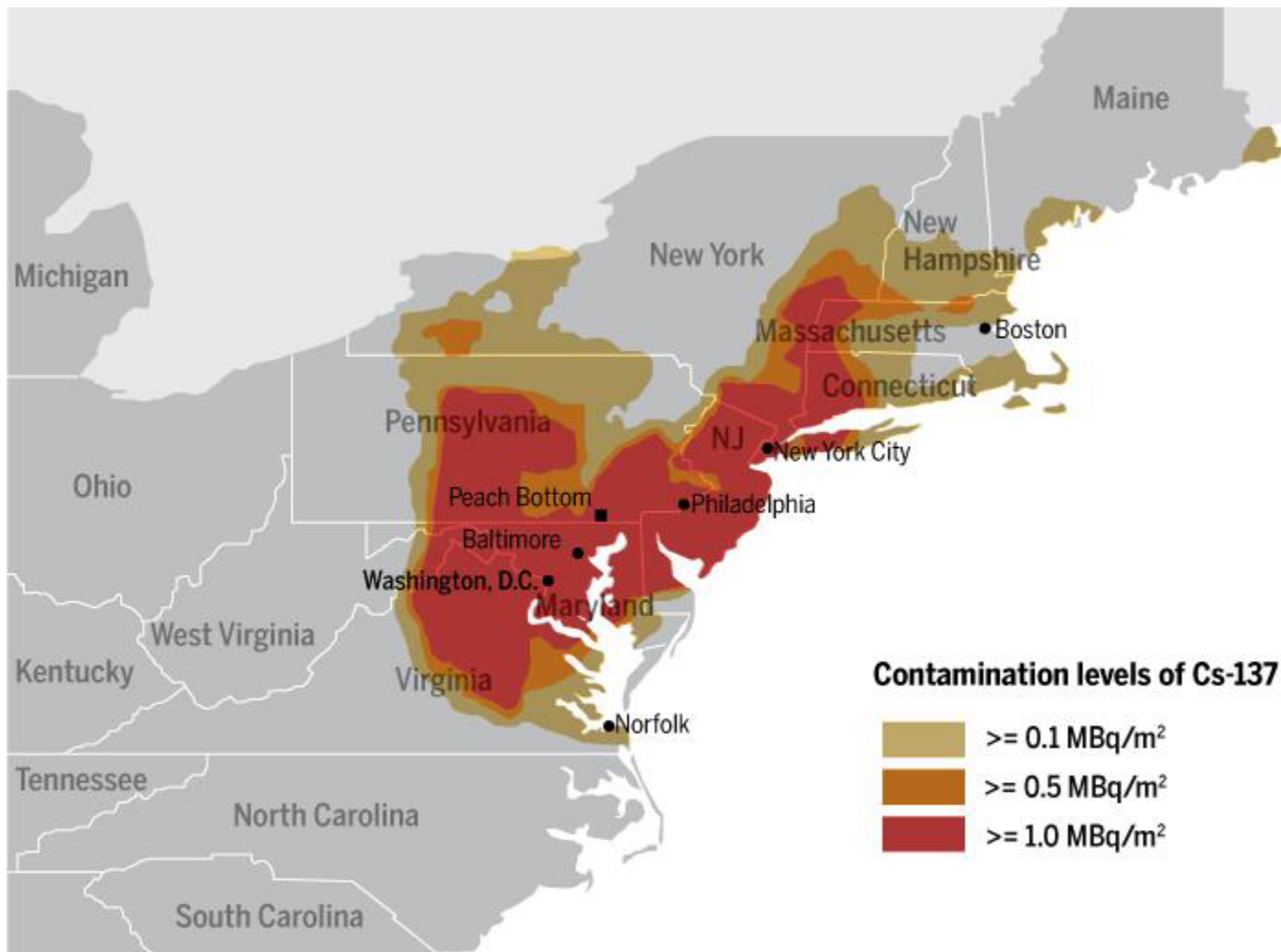
These follow similar action at Indian Point, NY, by the State of New York Attorney General, Letitia James', Office, now a federal court appeal. Intervention contentions include the corporate character of Holtec and its partner SNC-Lavalin

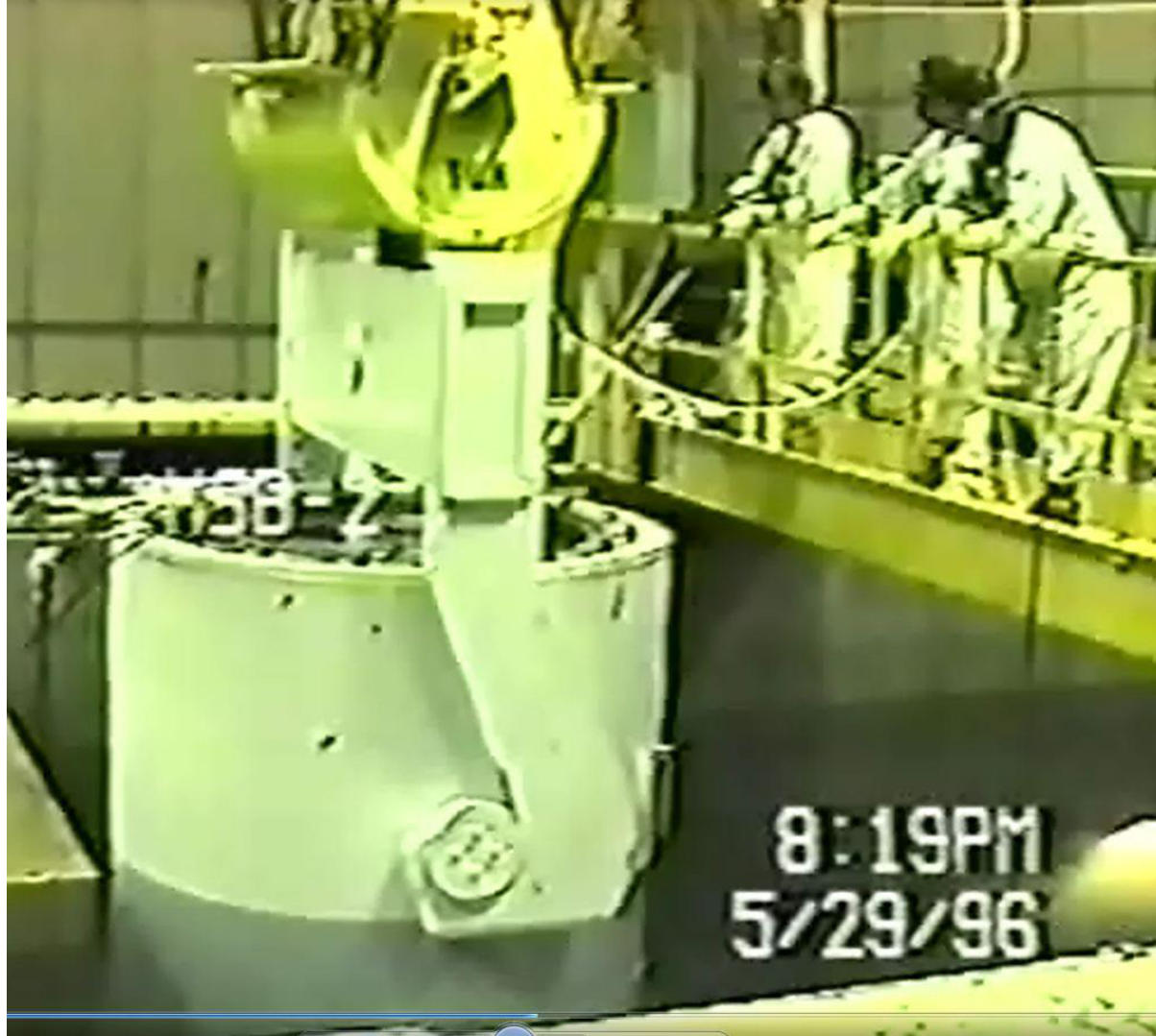
Enforce emergency response and preparedness regulations throughout decommissioning phase, in regard to irradiated nuclear fuel risks

---Risk of pool fire

---Dry cask storage risks

---Radioactive dust cloud risk during facilities dismantlement, contaminated soil movement, etc.





Palisades' Oct. 2005 fully-loaded cask dangle above pool

---"**NUCLEAR SAFETY LEFT HANGING AS CRANE DANGLED FUEL RODS:**
MICHIGAN INCIDENT GOT WARNING BUT NO FINE," HUGH McDIARMID JR.,
DETROIT FREE PRESS, March 18, 2006

---*Summary Report: High-Level Atomic Waste Mishap at Palisades Nuclear Reactor Risks
Radioactive Inferno with Casualty Potential of Thousands of Deaths Downwind Based,
Upon U.S. Nuclear Regulatory Commission Freedom of Information Act (FOIA) Response
Documents*, April 4, 2006, by Kevin Kamps, NIRS



RECOMMENDATIONS

---Block CISFs and Yucca Mountain dump-site

---Stop Holtec/SNC-Lavalin takeover of Palisades and Big Rock Point licenses, prevent draining of NDTF for non-decommissioning expenses

---Require strict enforcement of emergency response preparedness and planning for as long as irradiated nuclear fuel risks remain on-site (both pool storage and dry cask storage)

Record high Lake Michigan water levels

---Western dry cask storage pad vulnerable to severe shoreline erosion (flooding, storm surges, seiches, meteotsunamis, earthquakes)

---Risks of floodwaters spreading site's radioactive and toxic chemical contamination

---Risk of contaminants entering Lake Michigan and/or underground aquifer drinking water supplies (bio-accumulation in Lake Michigan, as through eating fish; chronic "dilute" drinking water doses from Lake Michigan; acute drinking water doses from concentrated aquifer contamination)

Palisades VSC-24s on Lakeside Eastern Pad



Big Rock Point dry cask storage installation



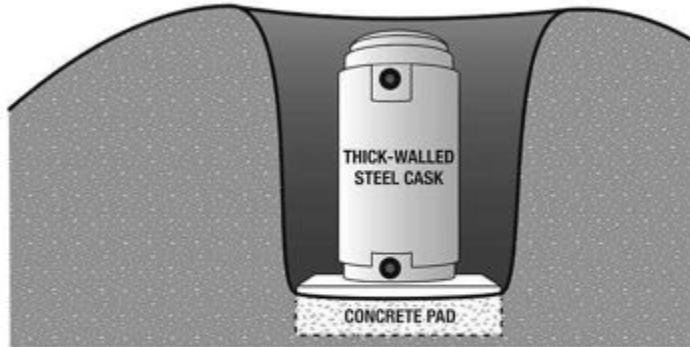
RECOMMENDATIONS

---Hardened On-Site Storage, further inland, to higher ground (Eastern Cask Pad not acceptable due to NRC earthquake safety regulation violation)

---Comprehensive radiological clean up of facilities and site (no shallow cut off at 3 feet deep; hence need to preserve, and expand, NDTF)

Hardened, or Robust, On-Site Storage

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.

