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Congressional Briefing on Nuclear Risks to Lake Michigan, by Kevin Kamps, Beyond Nuclear & Don't Waste Michigan, April 7, 2021

References/Citations:

Slide #12: May 10, 2006: Consumers Energy's briefing to State of Michigan regulators regarding its intention to sell the Palisades reactor as quickly as possible, revealing important problems afflicting the plant. Also see notes by Kevin Kamps, NIRS nuclear waste specialist, with thoughts/remarks on the briefing. <http://archives.nirs.us/reactorwatch/licensing/kampsconsbrifeinf051806.htm>

Slide #15: See "Entergy and NRC Watchers needed at NRC meeting on Palisades' CRDM [Control Rod Drive Mechanism] through-wall leakage" (September 26, 2012) <http://www.beyondnuclear.org/safety/2012/9/26/entergy-nrc-watchers-needed-at-nrc-meeting-on-palisades-crdm.html>, and also "David Lochbaum of UCS to speak about Palisades in west MI on Thurs., April 11th [2013]," <http://www.beyondnuclear.org/safety/2012/9/26/entergy-nrc-watchers-needed-at-nrc-meeting-on-palisades-crdm.html>. See particularly:

Lochbaum has long watch-dogged Palisades in particular, due to its uniquely bad (that is, risky) operational performance. For example, in July 2010, he wrote a report about Palisades' *40 years* of control rod drive mechanism (CRDM) seal leaks: "Headaches at Palisades: Broken Seals and Failed Heals." His report included a CRDM through-wall leak at Palisades in 2001. His current annual report…highlights the significance of a 2012 CRDM through-wall leak at Palisades, the subject of an "All Things Nuclear" blog Lochbaum wrote last December, "Palisades reprises Davis-Besse," referring to the Hole-in-the-Head, reactor lid corrosion fiasco of 2002 at a reactor near Toledo, which the U.S. Government Accountability Office has reported as the most infamous nuclear safety incident in the U.S. since the Three Mile Island meltdown 34 years ago.

See the July 16, 2010 Lochbaum report posted online here: <http://www.beyondnuclear.org/safety/2010/7/16/headaches-at-palisades-broken-seals-failed-heals.html>

Slide #16: A diagram depicting pressurized thermal shock (PTS) risk in an embrittled nuclear reactor. Credit: Japan Atomic Energy Agency.

Slide #17: For an annotated bibliography about the neutron embrittlement of reactor pressure vessels/pressurized thermal shock issues, see: <http://www.beyondnuclear.org/safety/2014/10/30/beyond-nuclear-warns-nrc-against-weakening-rpv-embrittlement.html>.

Slide #18: See Nuclear-Free Great Lakes Action Camp 2000, and related information, posted at: <http://archives.nirs.us/reactorwatch/licensing/palisades.htm>.

Slide #19: The Dec. 18, 2014, short, humorous, educational video "Nuclear Crack Down?," about neutron embrittlement of reactor pressure vessels leading to pressurized thermal shock risk, is posted online at: <http://archives.nirs.us/reactorwatch/licensing/palisades.htm>. Gundersen's July 16, 2015 essay "Downstream," about what

a Fukushima-scale catastrophe at any atomic reactor on the Great Lakes shorelines would look like, is posted online at: <https://www.fairewinds.org/demystify/downstream?rq=downstream>.

Slide #20: Palisades' 50-mile radius (100-mile diameter) Emergency Planning Zone.

Slide #21: See CRAC-II chart posted online here: <http://static1.1.sqspcdn.com/static/f/356082/26392673/1601841921027/CRAC+2+chart+for+drop+final.pdf?token=BLBXD7nrgNCnUl3ttvA8k0gl5dw%3D>

Slide #23: See two articles, from mid-2012, published by Citizens Nuclear Information Center-Tokyo, re: reactor pressure vessel (RPV) neutron embrittlement and pressurized thermal shock risk at Japan's worst embrittled RPV, Genkai Unit 1: <https://cnic.jp/english/?p=2653> and <https://cnic.jp/english/?p=2654>. They are entitled/dated: "Aging Nuclear Power Plants, focusing in particular on irradiation embrittlement of pressure vessels," *NukeInfo Tokyo* #148, published May 11, 2012, and continued in *NukeInfo Tokyo* #149, published July 11, 2012; the pair of articles was updated March 11, 2015. The author of both article installments is Hisamitsu Ino. CNIC Tokyo has published a biographical article about the author: <https://cnic.jp/english/newsletter/nit132/nit132articles/ww132.html>. The gist of Hisamitsu Ino's articles is that predictions of embrittlement at Genkai Unit 1 proved to be significantly overly optimistic, non-conservative, when the predictions were finally, at long last, checked against actual physical data. The embrittlement was way worse than Japan's nuclear power industry and government safety regulators had predicted. The reality data-based validation of the overly optimistic hypothesis was long overdue, despite the high safety stakes involved. After this revelation that embrittlement was actually much worse than had been predicted at Genkai Unit 1, the reactor was summarily shut down for good, post-Fukushima. The Japanese people would no longer sit idly by in the face of such risks. We should follow their inspiring and wise example, here in the U.S. In the U.S., the NRC and nuclear power industry, as at Point Beach Unit 2, just keep making rosy predictions on paper, while scrupulously avoiding actual physical data that is quite close at hand -- capsules in RPVs that have never been harvested and analyzed; shut for good RPVs that could be "autopsied" (comprehensively and carefully examined and analyzed for physical data, such as extent of neutron embrittlement), etc. What is it that NRC and the U.S. nuclear industry don't want to know, don't want to find? There are still more than 60 Pressurized Water Reactors operating across the U.S., at various levels of vulnerability to neutron embrittlement of their RPVs, and hence pressurized thermal shock (PTS) through-wall fracture risk, which would lead to core meltdown, and potentially catastrophic releases of hazardous radiation, if containment(s) are damaged or destroyed, as happened at Fukushima, Japan beginning on 3/11/11.

Slide #25: Project on Government Oversight (POGO), "Nuclear Power Plant Security: Voices from Inside the Fences," September 12, 2002, viewable online at: <https://www.pogo.org/report/2002/09/nuclear-power-plant-security-voices-from-inside-fences/>. "Mercenary," *Esquire*, May 15, 2007, viewable online at: <https://www.esquire.com/news-politics/a2878/mercenary0607/>. (See also related NIRS press release: <http://archives.nirs.us/press/05-15-2007/1>. "Burning Down the House on Nuclear Regulations: Palisades Lessons NOT Learned from Entergy's Prior Fire Safety and Security Violations," July 14, 2016, viewable online at <http://www.beyondnuclear.org/safety/2016/7/9/beyond-nuclear-backgrounder-re-fire-security-risks-at-palisa.html>.

Slide #26: See <http://www.beyondnuclear.org/home/2014/6/21/safecast-upload-of-the-month.html>.

Slide #29: For more information regarding just transitions during the transition from the operational to decommissioning phase at nuclear power plant sites, see: <https://neis.org/just-transitions/>; <https://www.nirs.org/fitzpatrick-reactor-can-be-replaced-with-clean-renewable-energy-at-a-lower-cost/>

Slide #31: Learn more about the resistance to CISFs at: <http://www.beyondnuclear.org/centralized-storage/>.

Slide #32: See this backgrounder: <https://www.nirs.org/wp-content/uploads/factsheets/mibargefactsheet92804.pdf>. Note that while the backgrounder was prepared in the context of the Yucca Mountain, Nevada dump-site targeted at Western Shoshone land, out-bound shipments to CISFs in TX and/or NM could very well also utilize these very same barge shipment routes on the Great Lakes.

Slide #33: Figure taken from: <http://www.state.nv.us/nucwaste/news2017/pdf/States_Affected.pdf> (arranged in alphabetical order by state name. Michigan is #20 of 45.) Also see southern Lake Michigan region close-up view of road and rail routes, much of it within the Lake Michigan watershed, here: <http://www.state.nv.us/nucwaste/news2017/pdf/Cities_Affected.pdf> (slide # 3 of 20). See shipment numbers per state, by road and rail, as well as congressional districts impacted, here: <http://www.state.nv.us/nucwaste/news2017/pdf/Congressional_Districts_Affected.pdf>. Learn more about transport risk issues here: <http://www.state.nv.us/nucwaste/trans.htm>.

Slide #34: This photo is to give an idea what an irradiated nuclear fuel Heavy-Haul Truck (HHT) shipment from Palisades to Bangor, or from Big Rock Point to Gaylord, could look like. The photo, however, shows the Big Rock Point reactor pressure vessel HHT shipment to Gaylord in 2003. To learn more about the photo, and the numerous incidents that plagued that particular shipment, see the 2003 entries posted here: <http://archives.nirs.us/radwaste/hlwtransport/mobilechernobyl.htm>. The photo and byline are just to the right and slightly above the posted entries.

Slide #36: See <http://static1.1.sqspcdn.com/static/f/356082/28409693/1614737920993/12+23+20+Palisades+PSDAR+-+PSDAR-1.pdf?token=yzRbdvX5YmLPKg8aMkLSvebJwCI%3D>.

Slide #37: See <http://www.beyondnuclear.org/reports/>.

Slide #38: For tritium leaks into control room, see <http://www.beyondnuclear.org/home/2012/6/28/nrc-office-of-investigations-launches-probe-into-palisades-s.html>. For a related tritium leak into Lake Michigan, see <http://www.beyondnuclear.org/environmental-impacts-whats-ne/2013/5/7/entergys-palisades-leaks-79-gallons-of-radioactive-water-int.html>, and <http://www.beyondnuclear.org/nuclear-reactors-whatsnew/2013/5/14/coalition-of-local-residents-and-environmental-groups-confro.html>. For flooding of the Radwaste Building, see <https://www.nrc.gov/docs/ML0608/ML060870601.pdf>. See also Beyond Nuclear, et al., intervention petition and hearing request against Palisades/Big Rock Point license transfer from Entergy to Holtec <http://static1.1.sqspcdn.com/static/f/356082/28407932/1614228735173/2+24+21+Petn+COMPLET-1.pdf?token=muGrPSz8AsEygwHXn9h5M8Q2hA0%3D>, such as on Pages 20 and 24. For hydrazine leak, see "DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT - NON RADIOLOGICAL NPDES PERMIT VIOLATION REPORT - MAY THROUGH OCTOBER 1991," Consumers Power submission to U.S. Nuclear Regulatory Commission Document Control Desk, dated November 26, 1991, 13 pages, posted online here: <http://static1.1.sqspcdn.com/static/f/356082/28427652/1618798533067/11+26+1991+CCF_000008+HYDRAZINE+SPILL+LEAK.pdf?token=yxh0fegEq0uWtXQ6xjRntHypIxw%3D>.

Slide #39: See <http://www.beyondnuclear.org/decommissioning/month/february-2021> and <https://ag.ny.gov/press-release/2021/attorney-general-james-files-lawsuit-support-safe-rapid-and-complete-dismantling>. Re: the corporate character of Holtec and SNC-Lavalin, see <http://www.beyondnuclear.org/centralized-storage/2019/7/25/radioactive-skeletons-in-holtec-internationals-closet.html>, <http://www.beyondnuclear.org/decommissioning/2019/7/26/radioactive-and-other-skeletons-in-snc-lavalins-closet.html>, and <http://static1.1.sqspcdn.com/static/f/356082/28258075/1582115755427/2+16+20+Holtec+SNC-L+Profiles+2-16-20.pdf?token=nC8hnZcsTZ19Kol0sDEuKO5TWf8%3D>.

Slide #40: Re: risk of pool fires, see <http://www.beyondnuclear.org/on-site-storage/2016/5/26/spent-fuel-fire-on-us-soil-could-dwarf-impact-of-fukushima.html>, <http://static1.1.sqspcdn.com/static/f/356082/23136695/1588946572697/11_1Alvarez.pdf?token=Imz8Sbg0TdlmeDH1Zzic1WayDss%3D>, and <http://static1.1.sqspcdn.com/static/f/356082/23136699/1374165044810/spent_nuclear_fuel_pools_in_the_US1.pdf?token=IaluqIVCKgnd%2Fg7opLsOWmuonpM%3D>. Re: dry cask storage risks, see, as but one example, the expert testimony of Dr. Gordon Thompson, in opposition to NRC's Nuclear Waste Confidence Rule, asserting that the zirconium cladding on irradiated nuclear fuel within dry casks can be set on fire, as by a terrorist attack: <http://static1.1.sqspcdn.com/static/f/356082/23236500/1375464906307/8+1+13+Cover+letter+and+Thompson+Comments+on+Consequence+Study+8-1-13-1.pdf?token=%2FgUI7j3RkRK29DvAoeE0Num1eJU%3D>. Re: radioactive dust cloud risks, see news coverage of the 2013 radiological releases and fallout downwind from Fukushima Daiichi Unit 3 in Japan.

Slide #41: See <http://www.beyondnuclear.org/on-site-storage/2016/5/26/spent-fuel-fire-on-us-soil-could-dwarf-impact-of-fukushima.html>.

Slide #42: Photo from the infamous, late May 1996, Point Beach VSC-24 loading incident that led to a hydrogen gas explosion within the dry cask.

Slide #43: *Detroit Free Press* article <http://static1.1.sqspcdn.com/static/f/356082/26971115/1618258224757/Cask+Dangle+Article+Detroit+Free+Press+march+18+2006-5.pdf?token=0hQ5e4tqLjYup%2BZy4%2FSn8u3InW8%3D> (also see environmental coalition press release <http://archives.nirs.us/press/03-20-2006/1>); NIRS Summary Report <http://archives.nirs.us/reactorwatch/licensing/caskdanglesummaryreport4406.pdf>.

Slide #44: Photo from emergency unloading of Fukushima Daiichi Unit 4 indoor wet storage pool, post-catastrophe initiation. Photo origin: Tokyo Electric Power Company.

Slide #46: Re: meteotsunamis <https://www.chicagotribune.com/news/environment/ct-meteotsunamis-lake-michigan-climate-change-20210406-bouuiosftje5fgqbfoihsaxhnq-story.html>. Re: earthquake risks, see <http://archives.nirs.us/reactorwatch/licensing/020207landsmandec.pdf> and <http://archives.nirs.us/reactorwatch/licensing/021794rosslandsmanltrnrcchairmanselin.pdf>.

Slide #47: Photo credit, WUOM, Michigan Radio.

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