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United States: The Palisades Embrittlement Battle

Louisiana-based Entergy has vowed to appeal a recent decision by a Nuclear Regulatory Commission (NRC) advisory board that would grant an evidentiary hearing to an environmental coalition arguing against one of the two license amendment requests (LARs) for the utility's Palisades reactor in Michigan. Such a hearing would likely delay and complicate any NRC acceptance of the LARs, in which Entergy hopes to change the allowed threshold for the embrittlement of the weakening reactor pressure vessel (RPV) at Palisades, a 793 megawatt pressurized water reactor commissioned in 1971 (NIW Jun.14'13). Under current embrittlement criteria, the reactor would reach this threshold by August 2017; if Entergy is successful in modifying the criteria it could then extend the life of the RPV to at least 2031, when the plant's current license expires.

The tussle between the two could decide the fate of other reactors with similar risk of embrittlement: besides Palisades, Point Beach-2 in Wisconsin, Indian Point-3 in New York, Diablo Canyon-1 in California and Beaver Valley-1 in Pennsylvania are also brushing up against their embrittlement end-dates.

"We do not believe that this matter needs to proceed to a hearing," Entergy representative Lindsay Rose told NIW, and the company will file an appeal "shortly." While no hearing is yet scheduled, it was ordered by a Jun. 18 decision of a panel of the Atomic Safety and Licensing Board (ASLB), which serves in an advisory capacity to the NRC (NIW Jun.26'15). The panel agreed that the intervenors—a consortium including Maryland-based Beyond Nuclear and Nuclear Energy Information Service of Chicago—met requirements for standing "and have an admissible contention," an NRC spokesperson told NIW last month.

As one of the country's older reactors, Palisades has been pegged by the NRC as having the most embrittled reactor pressure vessel due to its age and the construction materials. Embrittlement, or the weakening of walls and welds due to neutron radiation bombardment on soft metal impurities — such as the copper used in Palisades' RPV — introduces the risk of cracking of the RPV under certain rare situations.

Mixed ASLB Decisions

The coalition has had a mixed record in opposing the two LARs for Palisades that Entergy filed last year. In its successful appeal for a hearing the coalition argued against the second Palisades LAR based on Entergy's new methodology for evaluating the risk of ductile tearing in the RPV. Palisades is predicted to surpass criteria set for the risk of ductile tearing — metal degradation from both neutron irradiation and the heat generated by the reactor over time — in December of 2016, which would be alleviated with Entergy's proposed equivalent margins analysis (EMA). While the standing method is to test a piece of metal —

usually from a "sister" plant, or a plant constructed from the same materials — for its strength, EMA takes into account other defenses available even if the piece of metal failed the test. EMA would "demonstrate that our reactor vessel will satisfy the screening criterion through our extended period of operation (2031)," Entergy's Rose said.

The environmental coalition isn't so convinced: this amounts to "pencil whipping the problem" to "appear okay," said Kevin Kamps of Beyond Nuclear. The coalition is especially concerned about the lack of physical data; arguing that both the EMA and the alternate rule addressed in the first LAR rely more on calculations than physical evidence. In addition, the coalition criticizes the use of metal from sister plants (Robinson, Diablo Canyon and Indian Point-2 and -3), citing the four metal "coupons" — sample metal in the RPV that can be tested to gauge embrittlement — available at Palisades. The last time a Palisades coupon was pulled was in 2003, and the next scheduled date won't be until 2019 — after Palisades is set to surpass embrittlement criteria. Meanwhile, the NRC has indicated the limited number of coupons restricts their use of them. An NRC representative told NIW that due to their proximity to the reactor core, the coupons experience embrittlement faster than the Palisades RPV. As such, the NRC believes it is not necessary to pull another coupon until 2019.

The coalition's success on this issue is tempered by its failure on May 8, when the ASLB rejected the substance of the coalition's argument against the first Palisades LAR. ASLB denied a hearing on that LAR, which involved adoption of an alternate rule the NRC established in 2010 that would allow the RPV to operate beyond 2017, the date it is estimated to surpass embrittlement standards. Palisades "would not be allowed to operate if the standards applied to Yankee Rowe were applied" to it, said Dave Lochbaum of the Union of Concerned Scientists, referring to a plant shut down in 1992 due to embrittlement. Entergy and ASLB argue otherwise: "The alternate rule uses more rigorous and more detailed technology to more accurately evaluate" the RPV, said Entergy's Rose. Entergy has conducted a series of vessel inspections, the results of which are currently being reviewed by the NRC.

Just as Entergy will appeal the Jun. 18 ASLB decision granting a hearing on the second Palisades LAR, the environmental coalition has appealed the May 8 denial of their request for a public hearing on the first LAR. The appeals process poses a real danger for anti-nuclear opponents, who have seen hearings dissolve after an appeal more than once. In both the Davis-Besse and Seabrook nuclear license extension proceedings, owners appealed to the full NRC commission after environmental groups were granted hearings to challenge the extensions, and successfully blocked the hearings from taking place.

Rosa Lin, Washington
rlin@energyintel.com