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**Comment on the Draft Environmental Impact Statement (DEIS)  
For Point Beach Nuclear Reactors**

The DEIS for the Point Beach Nuclear Reactors fails to address one of the most crucial safety questions for aging nuclear reactors such as Point Beach, namely, the problem of neutron embrittlement of the nuclear reactor. Scientists have long been aware that neutron radiation from inside the nuclear core would gradually destroy the thick metal nuclear reactor that surrounds the core. This should have been addressed in the DEIS when looking at Severe Accident Mitigation Analysis (SAMA).

According to nuclear expert Arnold Gundersen, "If embrittlement becomes extensive, the dense metallic nuclear reactor can shatter like glass...creating what the Nuclear Regulatory Commission (NRC) calls a Class 9 Accident, which is the worst nuclear catastrophe presently acknowledged by the NRC...The NRC has identified that NextEra's Point Beach Reactors are the most embrittled operating reactors in the United States."<sup>[1]</sup>

Neutron embrittlement happens to all reactors, but the issue is especially crucial in reactors built before 1972, such as Point Beach. Those vessels were built using copper – which is no longer used in reactor construction because it is more prone to embrittlement – in the walls and welds. According to the NRC, "Pressurized water reactors (PWRs) are more susceptible to embrittlement than

are boiling water reactors (BWRs)...Steels with a higher proportion of copper and nickel will tend to be more susceptible to embrittlement than are steels with lower proportions of these two elements...<sup>[2]</sup>

The NRC estimated that both the Point Beach 2 reactor, located on Wisconsin's Lake Michigan shoreline, and the Palisades nuclear power plant, also located on the Lake Michigan shoreline in Covert, Michigan, were expected to reach the traditional embrittlement screening limits in 2017.<sup>[3]</sup> Some scientists have called embrittlement the single most important factor in determining the life span of a reactor.

Unlike the Palisades reactor, that has announced permanent closure by May 31, 2022, Point Beach has sought permission to operate 30 more years, despite increasing, age-related degradation risks. With thermal shock from rapid cooling or from overheating, the steel vessel could crack, releasing coolant from around the fuel rods, leading to a core meltdown, as it did at the Fukushima Daiichi site in Japan on March 11, 2011. Pressurized thermal shock is a problem most severe in the older generation of reactors - those built before the mid-1970s, such as the Point Beach reactors.

In 1982, Demetrios L. Basdekas, an NRC Reactor Safety Engineer, expressed his concern about the age-degradation risks of reactor embrittlement in a letter published in the *New York Times*:

“ There is a high, increasing likelihood that someday soon during a seemingly minor malfunction at any of a dozen or more nuclear plants around the United States, the steel vessel that houses the radioactive core is going to crack like a piece of glass. The result will be a core meltdown, the most serious kind of accident, which will injure many people, and probably destroy the nuclear industry with it.”<sup>[4]</sup>

The failure of the DEIS to address the increasing risk of the embrittlement of the reactor pressure vessel is all the more surprising because this is not only a safety issue, but a clear environmental risk, required to be evaluated, according to the National Environmental Policy Act (NEPA) and to the NRC's DEIS.

The casualty and property damage figures from the NRC's "Consequences of Reactor Accident (CRAC-2) Report show that a reactor meltdown, (as due to a pressurized thermal shock through-wall crack, due to reactor pressure embrittlement), would have catastrophic negative impacts on health and the economy of nearby neighborhoods and the people who live and work in those communities.<sup>[5]</sup> These impacts should have been evaluated in the DEIS, as required by NEPA.

*Al Gedicks is the executive secretary of the Wisconsin Resources Protection Council in La Crosse, Wisconsin. [www.wrpc.net](http://www.wrpc.net)*

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[1] Arnold Gundersen, In the Matter of NextEra Energy Point Beach, LLC, Docket Nos. 50-266 and 50-301, NRC-2021-0021, March 23, 2021. Arnold Gundersen is the chief engineer for Fairewinds Associates, Inc, an expert witness and paralegal services firm specializing in nuclear engineering, nuclear operations, and nuclear power plant safety analysis and assessment.

[2] NRC Fact Sheet on Reactor Pressure Vessel Issues, Embrittlement, [http://www.nrc.gov/reading-rm/doc-collections/fact-sheets.prv.html](http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/prv.html)

[3] Yvonne Zipp, "Palisades Nuclear Plant: Embrittlement in the reactor is an issue," *Kalamazoo Gazette*, January 20, 2019. [https://www.mlive.com/news/kalamazoo/204/08/palisades\\_nuclear\\_plant\\_embrit.html](https://www.mlive.com/news/kalamazoo/204/08/palisades_nuclear_plant_embrit.html)

[4] *New York Times*, March 29, 1982.

[5] The CRAC- 2 Report on Accident Consequences for Point Beach, Units 1 & 2, Two Rivers, Wisconsin, are as follows:

Unit 1 – 500 Peak Early Deaths (1980 census)

Unit 1 – 9000 Peak early injuries

Unit 1 – 7,000 Peak

Unit 1 - \$41.4 Billion Property Damage (index to 1982)

Unit 2 – 500

Unit 2 – 9,000  
Unit 2 - 7,000  
Unit 2 - \$43.8 Billion

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