Citizens' Environmental Coalition * Citizens Awareness Network * Coalition for a Nuclear Free Great Lakes * Council on Intelligent Energy & Conservation Policy * Don't Waste Michigan * Ecological Options Network * Michigan Safe Energy Future * Michigan Stop the Nuclear Bombs Campaign* Nortown Community Development Corporation * Nuclear Energy Information Service * Nuclear Information and Resource Service * Promoting Health and Sustainable Energy * San Francisco Bay Physicians for Social Responsibility * Vermont Yankee Decommissioning Alliance

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Office of Administration
Mailstop TWFN7A60M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

http://www.regulations.gov

Re: Docket ID: NRC-2020–0277-001 Point Beach Nuclear Plant, Units 1 & 2

We were provided with inadequate time to address the many significant issues associated with long term renewals of operations at the Point Beach Nuclear Plant. The dangers of continued operations beyond 40 years are unacceptable for the increased population within the emergency planning zone and the region. Even more significant is the extraordinary value of the Great Lakes to the US and North America. The value of the Great Lakes was strengthened under the Clean Air Act Amendments and the Great Waters program as an irreplaceable resource for the nation. A nuclear and radiological catastrophe in Lake Michigan, like Chernobyl and Fukushima would result in harm so extensive as to be incalculable.

NRC has operated for at least the last four years to advance a deregulatory framework for nuclear reactors including the adoption of harmful policies which provided economic benefits for the nuclear industry. At the same time the previous administration denied the existence of climate change as a global or even national issue of concern.

We further explore these issues below:

Catastrophic risks associated with routine nuclear reactor operations and radioactive waste.

The impacts of Climate Change on the Great Lakes and the potential interactions with nuclear reactors and nuclear waste installations.

The extraordinary value of the Great Lakes and the impossibility of restoration and recovery following a nuclear catastrophe.

Alternative Energy Options- costs and benefits compared to Nuclear Energy.

OUTLINE

A. Point Beach Nuclear Reactors- Units 1 & 2 License Renewal Applications

1. When these nuclear reactors were originally approved all equipment and designs were reviewed. The entire plant, its engineering design and safety elements were evaluated based on a 40 year lifetime only. Unit 1 was put into service Oct. 5, 1970 and Unit 2 was put into service March 8, 1973.

   Unit 1- Oct 5, 1970 to March 3, 2021 = 30+20 or 50 years old currently.

   Unit 2 Mar. 8, 1973 to March 3, 2021= 27+20 or 47 years old currently.

   It should be noted that there are very few existing nuclear reactors in the world that are over 50 years old. Most have required shutdown related to increasing maintenance, repair or major overhauls and associated high expenses.

2. The PBNP consists of two Westinghouse pressurized light-water moderated and cooled system units originally designed to generate 1518.5 megawatt thermal (MWt), or approximately 523.8 megawatt electric (MWe). Each unit has undergone a low pressure turbine retrofit modification which increases the unit

design output to 537.9 MWe. In 2003, a measurement uncertainty recapture power uprate was performed increasing each unit's rated thermal power level to 1540 MWt.

3. These nuclear reactors have existing licenses and subsequent renewals that last until Oct. 5th 2030 for Unit 1 and Mar. 8th 2033 for Unit 2. This tells us 2 things:

    - NRC plans to review these plants for license renewals NOW—not 8 years in the future or in 2029 for Unit 1 or 11 years in the future or in 2032 for Unit 2.
    - NRC will not have the entire renewal period and the operational experience available for review. Therefore it is not acceptable.

    What possible rationale is NRC using to review renewal applications so early? How comprehensive can NRC's review be given that 8 years or 11 years of operational experience will be missing? The only rationale that seems apparent is that a piggy- backed renewal facilitates a quick and simple review by NRC.

4. We would appreciate clarity regarding which scientific analyses will be undertaken by NRC scientists and engineers and which analyses will rely on the company's staff or consultants.

5. We question NRC's exclusion of moving parts and parts not subject to replacement based on a qualified life or specified time period. (10 CFR § 54.21) Based on the language used here NRC is operating under an assumption that parts that have a manufacturer's qualified life for replacement will actually be replaced.

    In our review of NRC inspection reports of nuclear reactors we have found "failure to timely replace a part" to be all too common and occasionally egregious. NRC inspectors do provide corrections for this problem, when discovered.

    The EIS should further explore this particular issue to evaluate its prevalence.

6. NRC claims some components were more effectively screened and scoped as commodities. There is no explanation that explains the meaning and rationale used here. p.1-8 of SLR

7. **Important Factual and Technical Materials are not provided in sufficient detail or appropriately referenced so the public can adequately review the scientific process and how a conclusion was reached.** Instead in the below paragraph we are told that the reactor vessels meet pressurized thermal shock toughness requirements and the time-limited aging analyses requirements for fracture toughness. Then we are told that analyses were reevaluated and that they met the screening criteria. This issue was one of the most important issues discussed in public meetings. The scientific support for the conclusions reached is simply not here. We have seen similar evidence of the same type of handling for critically important factual information throughout the subsequent license renewal application.

SLRA re: "2.1.3.4.3. Pressurized Thermal Shock (10 CFR 50.61) Fracture toughness requirements specified in 10 CFR 50.61 state that licensees of pressurized water reactors (PWRs) evaluate the reactor vessel beltline materials against specific criteria to ensure protection from brittle fracture. Pressurized thermal shock (PTS) is a potential pressurized water reactor (PWR) event or transient causing vessel failure due to severe overcooling (thermal shock) concurrent with, or followed by, significant pressure in the reactor vessel. The PBN CLB shows that the Unit 1 and 2 reactor vessels have been demonstrated to meet the toughness requirements of 10 CFR 50.61 through its current 60-year end-of-license period. The PBN Units 1 and 2 PTS time-limited aging analyses (TLAAs) discussed in Section 4.0 demonstrate that the fracture toughness requirements of 10 CFR 50.61 are met for the 80-year end-of-subsequent-license renewal period. The steps to identify systems and structures relied upon for protection against PTS at PBN that meet the associated criterion of 10 CFR 54.4(a)(3) are outlined below: • The UFSAR, Technical Specifications, TRM, and licensing correspondence were reviewed, as applicable. • Based on the above, the reactor vessels are the only components relied upon for protection against PTS. Analyses applicable to PTS have been reevaluated and demonstrated that the

reactors vessels meet the screening criteria at the end of the subsequent period of extended operation (SPEO). The scoping process to identify systems and structures relied upon and/or specifically committed to for PTS for PBN is consistent with and satisfies the associated criterion in 10 CFR 54.4(a)(3)."

The EIS should be more explicit regarding all scientific and technical reviews.

B. Actual Progress on Climate Change is limited by continued investments in Nuclear.

The High Cost of Nuclear power is the major barrier for this energy option, given the urgency to make progress on climate change.
In contrast we can act quickly to install multiple renewable energy options and efficiency that are cheap and easy to install within a short time frame. Thus efficiency and renewable options reduce costs while making urgent progress on climate change.

Energy efficiency and renewables offer almost immediate benefits. Efficiency actually saves dollars. For every dollar spent the return is 3-4 dollars of savings. Such savings can buy more renewables, batteries, efficient lighting, etc.

" In the United States, *unsubsidized* wind power costs fell by 71 percent between 2009 and 2020, whereas *unsubsidized* utility scale solar energy costs declined by 90 percent during the same period. Nuclear energy costs *increased* by 33 percent between 2009 and 2020. The International Energy Agency has dubbed solar energy 'the new king of electricity' and foresees it dominating future deployment in the electricity sector for decades."
* Jeffries & Ramana, "Big money, nuclear subsidies, and systemic corruption," Bulletin of Atomic Scientists, Feb.12, 2021.
Link: Big money, nuclear subsidies, and systemic corruption - Bulletin of the Atomic Scientists (thebulletin.org)

The Result of Choosing Efficiency and Renewables over Nuclear is Rapid Progress to meet climate change goals as well as Cost savings

The nuclear industry is no longer trying to build nuclear plants because they cannot afford them. Instead they are seeking major financial subsidies and approvals from state and federal governments that force consumers to pay for more nuclear plants or more improvements.

Nuclear Power is fundamentally unsustainable without major cash infusions. Systemic corruption has been the result as recently seen in Ohio with prosecution of state officials. Also See Link to article in Bulletin of Atomic Scientists above. Systematic deregulation of nuclear energy, reactors and new industry proposals by NRC and DOE have the effect of providing support or financial subsidies.

The EIS should discuss and account for all the assorted financial subsidies from multiple sources at the federal, state and local levels that the Point Beach reactors have received over the years since original planning.

C. **The Environmental Impact Statement must include a Full evaluation of Alternative Energy Options (including efficiency and renewables) to replace the full output of the Point Beach Nuclear Reactors including a complete comparison of costs over 40 years.**

D. **Intergenerational injustice.** Youth have highlighted the injustice of leaving a worsening climate crisis for them to solve. Governments and adults should be devoting resources now to significantly reduce the dangers and impacts of the climate crisis.

Similar inequities and injustices are associated with nuclear power and radioactive wastes. Radioactive wastes are distributed across the entire nation-most are not appropriately contained in facilities that limit public exposure. Radioactive contaminants permeate the air, water and soil, as well as the food chain. Birth defects, cancer and other health impacts affect large numbers of the population, including nuclear workers. Long term radioactive contamination for thousands to millions of years, affects many future generations, but the public health costs are not included when evaluating the cost of nuclear power. This is largely related to the failure to account for the impacts of nuclear waste.

Unlike Climate impacts which are becoming more apparent, especially related to increasing severe weather events, the health impacts from radiation are frequently hidden in the general population within multiple categories of health impacts.

Environmental Injustice is a more familiar term related to the unfairness of targeting particular groups with harmful or undesirable facilities based on race, ethnicity, background or a specific geographic area.

The Planned EIS should include a detailed inventory of all significant radiological contaminants having possible impacts to biota and the public associated with Lake Michigan, and environs. The evaluation should project biologic and health impacts currently and 50 years into the future- with and without a potential nuclear catastrophe.

E. Climate Change- Weather Impacts

The previous federal administration deliberately ignored and discounted actual impacts of climate change. As a consequence DOE, which had been a co-lead on Climate Change under President Obama, abandoned any work on climate change.

Since we are asking that Climate Change and the Great Lakes impacts be studied in the EIS, it means that NRC will have to utilize assistance from other agencies and a new administration.

These impacts include increased severity of many storm events, such as increased rainfall, and more severe flooding, wind events such as hurricanes and tornadoes have been more frequent and severe. New areas of the nation are affected and often involve longer seasons. Houston, Texas experienced three 500-year events over just three years. Large lakes can be uniquely affected by seiches and even tsunamis, which may result in major changes to the shoreline. Lake Michigan has experienced increased flooding. Higher water temperatures contribute to algae growth, and even require warnings to refrain from eating fish, when toxic blooms occur.

Repairs and New Construction Some of these impacts may require regular repairs or completely new construction. For example we do not know the exact position of the dry storage facility and whether it has been impacted by flooding. Emergency Diesel Generators may need to be relocated. Some additional facilities and equipment should be evaluated in the EIS—beyond those related to aging and degradation. What is the age of each dry storage cask? When were they last inspected and how was the inspection conducted? Has the presence of inert gas been confirmed for each canister? and on what date? How many casks are damaged and how is the damage addressed? How are you handling canister radiation leaks at this facility?

Extending the life of two aged nuclear reactors likely involves the continued use of many facilities. What is the capacity in the spent fuel pools for additional spent nuclear fuel and what percentage of the fuel is High Burnup Fuel? Additional equipment to keep pool temps low may be needed as SNF handling in the pool is increased.

Any and all potential impacts to both nuclear reactors and all associated facilities must be studied in the EIS.

F. Nuclear Risks associated with High Burnup Fuel

High Burnup Fuels have been widely adopted at nuclear reactors in order to extend the total operating time before a refueling is needed. However, HBF has an inadequate research base and there have been few efforts to fill the knowledge gaps.

HBF accumulates significant corrosion products-oxides and hydrides- in the metal fuel rods which leads to embrittlement of them. Future transportation is jeopardized by the possibility of damage from vibration and shocks during transport. Since 2010 US Nuclear Waste Technical Review Board has called for

substantial research on High Burnup fuels. The Board renewed that request in 2016. In general our nuclear agencies have not been responsive to the need for more research.

Additional Risks for Reactor Loss of Coolant accidents.

An engineering consultant was concerned about the effect of corrosion on fuel cladding in a reactor during a loss of coolant accident. Mark Leyse, an engineering consultant, submitted a petition for rulemaking in 2007, to address the problem of crud or oxide layers on fuel cladding and to limit the hydrogen content of fuel cladding. These corrosion products limit thermal conductivity and increase cladding temperatures during loss of coolant accidents for reactors.

NRC staff reviewed and delivered the Petition for rulemaking, PRM-50-84, to the Commission in March 2016 to address this problem, but unfortunately the Commission has not acted on this proposed rulemaking for five years. If the Commission had adopted this rulemaking, steps would have been taking to increase safety associated with loss of coolant accidents at reactors by addressing cladding degradation.

More Recently NRC is allowing research on new fuels at existing Nuclear Reactors.

The fuels being evaluated in the research are referred to as "accident tolerant fuels." In truth they should be referred to as potential candidates for accident tolerance. The research is not being conducted at NRC or DOE research facilities or labs. It is being conducted at ordinary nuclear reactors by reactor personnel.

Separate and apart from the testing of accident tolerance, the nuclear industry requested approval to further increase the percentage of HBF in reactors. HBF was formerly limited to 5% uranium enrichment. NRC approved fuel with 8-10% uranium enrichment. We have no substantial research on fuel with such an increased enrichment.

Point Beach nuclear reactors have some of the most embrittled pressure vessels in the nation. We have no knowledge of whether these reactors are planning to be involved in the testing of accident tolerant fuels. However, the Potential for a loss of coolant accident should be studied for these two reactors, including whether the pressure vessels might also be adversely impacted.

The EIS should study all the issues discussed here associated with high burnup fuel, whether Point Beach nuclear reactors will be involved in research on accident tolerant fuels as well as whether a LOCA might impact the embrittled pressure vessels.

G. **Nuclear Waste: Continuing to produce Nuclear Waste carries extraordinary Long Term cleanup costs and public health impacts for hundreds of thousands of years are not factored into the Total Costs for Nuclear Energy, when deciding to build reactors.**

Nuclear Waste makes Nuclear Energy Unsustainable also because there are no good solutions for nuclear waste.

- International research has identified new fundamental problems related to long term repositories that require more research
- Actual protective solutions to these problems require additional research.
- The US is relying entirely on this international collaborative research to develop needed solutions Follow the US Nuclear Waste Technical Review Board for meetings covering this topic. www.nwtrb.gov

Thank you for your attention.
Sincerely,

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