From: Judy Lukasiewicz <jsteel@cruzio.com>
Sent: Thursday, June 25, 2020 5:54 PM
To: AdvancedReactors-GEIS Resource
Subject: [External_Sender] Docket IDNRC-2020-0101: No Generic Review for Unknown, Untested Nuclear Reactors

Nuclear Regulatory Commission

RE: Docket IDNRC-2020-0101: No Generic Review for Unknown, Untested Nuclear Reactors

Dear ,

Dear Kenneth T. Erwin:

I am writing in opposition to the U.S. Nuclear Regulatory Commission's proposal to produce a "generic" environmental impact statement (GEIS) for "small-scale advanced nuclear reactors." The stated purpose of this proposal is to "streamline" , and thereby bypass, the necessary thorough environmental review process for unknown, untested types of nuclear reactors. This idea contradicts NRC's primary mission to protect the public health and safety, while not promoting the inefficient and unsafe commercial nuclear energy industry, for the following reasons:

1) NRC has no experience regulating "advanced" nuclear reactors (ANRs). There have been no commercial "non-light-water reactors" in operation in the US since the 1980s. In fact, only three were ever built, and all were licensed before the NRC was created in 1975. The NRC's lack of experience in regulating such a wide variety of possible reactor designs requires rigorous study and long-term testing and experience. NRC has only issued GEIS's for other issues (such as decommissioning and/or license renewal) after years of real-world industry and regulatory experience. NRC has absolutely no such basis for generically evaluating small-scale ANRs.

2) Creating a generic environmental review is an exercise in speculative fiction. There is no such thing as a "generic" ANR. In fact, the whole category of "advanced reactors" covers a far wider variety of potential reactor designs than exist today. There are potentially dozens of different combinations of fuel sources, fuel designs, moderators, and coolants. Each type of ANR would clearly have different probable safety issues and ways to release harmful radiation. They would also rely on wholly different fuel cycles, with a variety of negative environmental impacts.

3) There is no basis for assuming accidents with "small-scale" ANRs would not be able to cause dangerously significant offsite radiation releases. Nuclear power generation history shows there is no such thing as an accident-proof nuclear reactor. Nuclear reactors have been shown to be unsafe, and there is no way to safely dispose of highly radioactive nuclear waste. For instance, in the 1950s, US nuclear experts believed that light-water reactors (LWRs) had significant safety advantages over non-LWRs (or ANRs). Some concluded that LWRs were almost accident-proof, and therefore shouldn't require robust backup cooling systems. But, by the 1960s, further studies showed that meltdowns and large releases of highly damaging radiation were, in fact, very possible, requiring major design changes and resulting in significantly increased costs for licensing, construction, regulation, emergency planning,

security, etc. Still, there remains no safe method of generating nuclear power and/or of dealing with highly dangerous radioactive waste.

4) There is absolutely no basis for determining that the “microreactors” contemplated in the GEIS would have a “small environmental footprint” or that there would be no offsite radiation releases in the case of an accident. Even “small-scale” reactors would contain large amounts of dangerous radioactive material, and generate power at very high density. No real conclusion can be drawn about nuclear safety, unless it is based on a detailed review of each individual reactor design, including its fuel, moderator, coolant, and engineered safety and containment systems, as well as the site size, location, and seismic, and climatic conditions. Thus far, existing reactor designs have not been shown to be safe.

5) Non-light water reactors have been known to have significant safety risks for decades. For instance, sodium-cooled reactors have had fires and partial meltdowns (e.g., Fermi unit 1 in 1966), and carry the risk of catastrophic sodium-water explosions. Molten salt reactors generally have only one major barrier to releasing radiation, because the fuel within the reactor vessel is already in liquid form. Graphite-moderated reactors become extremely radioactive due to carbon-14 production, and they can catch fire in a loss of coolant accident.

6) Advanced reactors would generate many different kinds and forms of highly radioactive waste that would be even more impossible to manage than produced by the current light-water reactors. Some ANR designs could require on-site reprocessing of irradiated nuclear fuel, which entails enormous and dangerously toxic environmental impacts, releases of gaseous radioisotopes, and liquid radioactive waste streams that are extremely polluting and impossible to safely manage.

7) All of the environmental impacts of small-scale ANRs will have significant environmental justice impacts, from siting and construction, to reactor operations, leaks, and accidents; from toxic fuel extraction and processing, to decommissioning, waste storage (proven unsafe for long-term), and unsafe disposal. At every stage of the nuclear fuel cycle, polluting facilities and activities have been located disproportionately on our indigenous peoples’ lands and in African-American, Latinx, and other generally impoverished communities. There is no reason to expect that to change with ANRs, although new vectors of environmental injustice may result. For instance, the potential siting of ANRs in remote, problematic Arctic locations would most likely occur on the lands of indigenous peoples, compounding colonialist resource extraction's environmentally destructive and harmful health impacts with the introduction of extremely long-lasting and highly dangerous radiological contamination and indefinite periods of unsafe radioactive waste storage.

In addition, NRC must consider the futility of streamlining the environmental review and licensing process for ANRs due to the realities of climate change and the evolution of energy alternatives.

“Advanced” nuclear reactors cannot be safely licensed and built to address climate change, if any of them prove commercially viable at all. The international scientific consensus is that the world must be well on the way to phasing out fossil fuels by 2030: 40-60% reductions in greenhouse gas emissions (from 1990 levels) by 2030; and industrial nations like the US must achieve reductions at the high end of that range. By every reasonable assessment ANR designs (small-scale or large-) would not be viable or ready for widespread commercial deployment until the 2030s or 2040s. If that even were to happen, water temperatures, sea-level rise, weather patterns, melting glaciers and tundra, and other siting conditions will already be changing dramatically. For instance, some small-scale ANRs are envisioned for deployment in 'remote' locations, such as in proposed harmful arctic drilling operations. Not only is such

an application (drilling for obsolete oil and fossil gas) completely inconsistent with the demands of climate action (so that such a market will not actually exist), but such sites are and will continue to be subject to extreme instability, with the melting of permafrost and the destabilization of any potential reactor sites.

In addition, in any environmental impact statement, NRC must consider the need for the action and consider alternatives. Historically, NRC's evaluation of the need for nuclear reactors has failed to include a realistic assessment of their actual high costs, and it has used unrealistically unfavorable assessments of other feasible energy options. There is surely no excuse for that now. Greatly increased conservation measures, renewable energy, highly increased energy efficiency, battery storage, and other sustainable, carbon-free energy resources are rapidly falling in price and making safe, technological advances far faster than the nuclear industry can ever envision, let along possibly ever keep-up with. Widespread small-scale solar, offshore wind, massive conservation of energy/power, reduced consumerism, and energy efficiency are now the lowest cost solutions and energy resources available. In addition, battery storage, distributed small-scale solar, and offshore wind are on the same trajectory.

NRC must include a realistic, balanced, evidence-based assessment of current, global climate change impacts, all energy alternatives, and the trajectory of the energy industry, in all of its environmental reviews going forward.

For these reasons, it is clear and I believe NRC must abandon the proposal for any 'streamlined environmental review and licensing process' for all small-scale advanced nuclear reactors (and ANRs of any size). Pursuit of the GEIS proposal is a waste of NRC's resources, and would formidably compromise NRC's public health and safety mission.

Thank you.

Sincerely,
Judy Lukasiewicz

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