From: Joseph Weinstein <jweins123@hotmail.com>
Sent: Wednesday, June 24, 2020 9:09 PM
To: AdvancedReactors-GEIS Resource
Subject: [External_Sender] Docket IDNRC-2020-0101: Oppose Generic Review for Unknown, Untested Nuclear Reactors

Nuclear Regulatory Commission

RE: Docket IDNRC-2020-0101: Oppose Generic Review for Unknown, Untested Nuclear Reactors

Dear ,

Dear Kenneth T. Erwin:

I write to oppose the U.S. Nuclear Regulatory Commission's proposal to produce a "generic" environmental impact statement (GEIS) for "small-scale advanced nuclear reactors." This proposal explicitly aims to "streamline" the environmental review process for unknown and untested types of nuclear reactors. Such an approach may aid (or seem to aid) the commercial nuclear industry but for the following reasons #1-9 it contradicts NRC's primary mission to protect the public health and safety. Also, for reasons #10-12, the approach makes no sense in terms of the broader overall outlook for energy use, energy sources and impacts of climate change. Going forward, in all its environmental reviews NRC must adopt a more realistic approach which incorporates these factors.

1) NRC has no experience regulating "advanced" nuclear reactors (ANRs). There have been no commercial non-light-water reactors (non-LWRs) in operation in the US since the 1980s. Indeed only three were ever built, and all were licensed before the NRC was created in 1975.

2) As versus NRC's lack of experience, the task of regulating a wide variety of possible reactor designs requires rigorous study and experience. NRC has issued GEIS's for other actions (such as decommissioning and license renewal) only after years of real-world industry and regulatory experience. NRC has no such basis for generically evaluating small-scale ANR designs.

3) At this point, creation of a 'generic' environmental review is an exercise in speculation. The very notion of ANR 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 could use a distinct fuel cycle, with distinct environmental impacts, safety issues and radiation release pathways.

4) It cannot be assumed that accidents with "small-scale" ANRs would not cause significant offsite radiation releases. History shows there is no such thing as an accident-proof nuclear reactor. For example, in the 1950s US nuclear experts believed that LWRs had significant safety advantages over non-LWRs (or ANRs). Some concluded that LWRs were well-nigh accident-proof, and didn't require robust backup cooling systems. Yet by the 1960s new studies showed that meltdowns and large releases of radiation could occur, thereby requiring major design changes and significantly increasing costs for licensing, construction, regulation, emergency planning, and security.

5) There is no valid basis for concluding that every "microreactor" contemplated in the GEIS would have a "small environmental footprint" or that an accident would yield no offsite radiation releases. Even a "small-scale" reactor could contain large amounts of radioactive material, and generate power at very high density.

6) Correct conclusions about microreactor behavior required 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.

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

8) ANRs would generate many different kinds and forms of radioactive waste that could be even more difficult to manage than those produced by the current LWRs. Some ANR designs could require on-site reprocessing of irradiated nuclear fuel - thereby entailing enormous environmental impacts, releases of gaseous radioisotopes, and liquid radioactive waste streams that are extremely polluting and difficult to manage.

9) Small-scale ANRs will generally have significant environmental justice impacts at all stages: from siting and construction, reactor operations, leaks, accidents, fuel extraction and processing, decommissioning, waste storage, and disposal. At every stage of the nuclear fuel cycle, polluting facilities and activities have been located disproportionately on indigenous peoples' lands and in communities of color. There is no reason to expect that phenomenon to change with ANRs. In fact, new varieties of environmental injustice may result. For example, siting of ANRs in remote Arctic locations could well occur on indigenous peoples' lands, with new and long-term impacts from resource extraction, radiological contamination and radioactive waste storage.

Beyond the above negatives, for the following reasons NRC must also be wary of trying to streamline ANR environmental review and licensing in the face of realities of climate change and the evolution of energy alternatives

10) Even if commercially viable, ANRs cannot be safely licensed and built fast enough to address climate change. 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. Leading industrial nations like the USA must strive for reductions at the high end of that range.

By every reasonable assessment ANR designs (small-scale or large-) would not be ready for widespread commercial deployment until the 2030s or 2040s - when water temperatures, sea-level rise, weather patterns, and other siting conditions will already be changing dramatically.

11) Climate change now operates against the very deployment of hitherto envisioned small-scale ANRs. For instance, some ANRs have been envisioned to support arctic drilling operations. Besides such

operations being inconsistent with demands for climate action, permafrost melting would pose new and special hazards to reactor safety.

12) 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 costs, and it has used unrealistically unfavorable assessments of other energy options. There is no excuse for that now. Renewable energy, energy efficiency, battery storage, smart grids, and other sustainable, carbon-free energy resources are rapidly falling in price and making technological leaps and bounds far faster than the nuclear industry can possibly keep up. Wind, utility-scale solar, and energy efficiency are now the lowest cost energy resources available, and battery storage, distributed solar, and offshore wind on the same trajectory.

For all the above reasons, NRC should abandon the proposal for a streamlined environmental review and licensing process for small-scale (or any size) ANRs. The GEIS proposal would contradict NRC's public health and safety mission and, being based on unrealistic visions of the future, would be a waste of NRC's resources.

Sincerely,
Joseph Weinstein

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