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General Comment

I am opposed 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" the environmental review process for unknown, untested types of nuclear reactors. This would contradict NRC's primary mission to protect the public health and safety, not to promote the 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 experience. NRC has only issued GEIS's for other issues (such as decommissioning and license renewal) after years of real-world industry and regulatory experience. NRC has 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 have different possible safety issues and possible ways to release radiation. They would also rely on wholly different fuel cycles, with a variety of environmental impacts.

3) There is no basis for assuming accidents with "small-scale" ANRs would not be able to cause significant

offsite radiation releases. History shows there is no such thing as an accident-proof nuclear reactor. 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 well-nigh accident-proof, and didn't require robust backup cooling systems. But by the 1960s, further studies showed that meltdowns and large releases of radiation were, in fact, possible, requiring major design changes and resulting in significantly increased costs for licensing, construction, regulation, emergency planning, security, etc.

4) There is 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 radioactive material, and generate power at very high density. Such a conclusion could only be drawn 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.

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 radioactive waste that would be even more difficult 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 environmental impacts, releases of gaseous radioisotopes, and liquid radioactive waste streams that are extremely polluting and difficult to 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 fuel extraction and processing, to 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 African-American, Latinx, and other communities of color. 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 Arctic locations would potentially occur on the lands of indigenous peoples, compounding colonialist resource extraction.