From: DENNIS R NELSON Naturalist/Energy-Environmental Researcher <dennisnelson987@yahoo.com>
Sent: Thursday, June 18, 2020 4:30 PM
To: AdvancedReactors-GEIS Resource
Subject: [External_Sender] Docket IDNRC-2020-0101: NO GENERIC REVIEW FOR UNTESTED NUCLEAR REACTORS!!

Nuclear Regulatory Commission

RE: Docket IDNRC-2020-0101: NO GENERIC REVIEW FOR UNTESTED NUCLEAR REACTORS!!

Dear ,

Dear Kenneth T. Erwin, U.S. Nuclear Regulatory Commission (USNRC):

Ever since around the very first "EARTH DAY" (Wednesday, April 22, 1970), I have literally spent thousands of hours in researching, writing, speaking, and organizing about solving a host of energy and environmental problems. Over the past 50 years, my mainstay, stomping ground issue has been opposition to commercial nuclear power, and promoting a nuclear-free future. Continuing on, 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 the USNRC's primary mission to protect the public health and safety, NOT to promote the commercial nuclear energy industry, for the following reasons:

(1) The USNRC 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 USNRC was created in 1975. The USNRC's lack of experience in regulating such a wide variety of possible reactor designs requires rigorous study and experience. The USNRC has only issued GEIS's for other issues (such as decommissioning and license renewal) after years of real-world industry and regulatory experience. The USNRC 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 ionizing 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 ionizing 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 essentially accident-proof, and did not require robust backup cooling systems. But by the 1960s, further studies

showed that reactor core meltdowns and larger releases of ionizng 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 ionizing radiation releases in the case of an accident. Even “small-scale” reactors would contain larger 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, seismic factors, 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 core meltdowns (e.g., Fermi unit 1 in 1966), and carry the risk of catastrophic sodium-water explosions. Molten salt thorium reactors generally have only one major barrier to releasing ionizing 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 radionuclides, 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, and radioactive waste management. At every stage of the commercial nuclear fuel cycle, polluting facilities and activities have been located disproportionately on indigenous peoples’ lands and in African-American, Latino, 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 resource extraction impacts with the introduction of long-lasting radiological contamination and indefinite periods of radioactive waste storage.

In addition, the USNRC must consider the futility of streamlining the environmental review and licensing process for ANRs due to the realities of climate disruption and the development/promotion of "carbon-free/nuclear-free" energy technologies.

“Advanced” nuclear reactors cannot be safely licensed and built quickly enough to address climate disruption, even 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 would need to achieve 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. By the time that happens, water temperatures, sea-level rise, weather patterns, and other siting conditions will already be changing dramatically. For instance, some small-scale ANRs are envisioned for deployment in remote locations, such as Arctic drilling operations. Not only is such an application (drilling for oil and gas) inconsistent with the demands of climate action (so that such a market may not

actually exist), but such sites could be subject to extreme instability, with the melting of permafrost and the destabilization of the potential reactor sites.

In addition, in any environmental impact statement, the USNRC must consider the need for the action and consider alternatives. Historically, the USNRC'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! Appropriate renewables, energy efficiency, co-generation, advanced energy storage, smart grids, and other sustainable, "carbon-free/nuclear-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 turbines, 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.

The USNRC must include a realistic, balanced, evidence-based assessment of climate disruption, energy alternatives, and the trajectory of the energy industry in all of its environmental reviews going forward.

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

Sincerely,
DENNIS R NELSON Naturalist/Energy-Environmental Researcher

IL 60654
(773) 921-5290

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