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U.S. Nuclear Regulatory Commission
Office of the Secretary
ATTN: Rulemakings and Adjudications Staff
Washington, DC 20555

Subject: Generic Environmental Impact Statement for Licensing of New Nuclear Reactors (NRC-2020-0101)

To all concerned:

The State of New York has reviewed the U.S. Nuclear Regulatory Commission's (NRC's) proposed rulemaking "Generic Environmental Impact Statement for Licensing of New Nuclear Reactors" (NRC-2020-0101) published in the Federal Register on October 4, 2024. If promulgated, the rulemaking would codify the findings of the draft Generic Environmental Impact Statement (GEIS) for new reactors (NUREG-2249), amending the regulations for NRC's environmental reviews under the National Environmental Policy Act (NEPA).

The potential for nuclear energy to serve as a dispatchable emissions-free resource is currently under consideration in New York as the State moves to a deeply renewable electric grid. New York's draft Blueprint for Consideration of Advanced Nuclear Technologies is a first step in examining advanced nuclear's potential benefits to New York. This exploratory document also profiles the issues New York should be considering with regard to advanced nuclear including technological readiness, disadvantaged community concerns, environmental justice, costs and financing, waste profiles, as well as siting and environmental considerations. New York places a strong policy focus on environmental protection and appreciates all opportunities to provide input to the NRC on initiatives affecting nuclear power plants in the State. We offer the following feedback on the draft GEIS.

As an initial matter, we support the idea of a generic approach to generic issues, where robust and thorough analysis is performed at the GEIS stage with sufficient basis such that all stakeholders can understand, and opine on, such impacts, knowing that it may be years before such a facility is proposed in any specific community. As a practical matter, few potential future host communities are actively watching for public comment opportunities on generic environmental analyses, instead reacting only to license applications once filed, when the prospect of any specific reactor site is more real. As such, we view the GEIS from the eyes of a host state, seeking to ensure that robust analysis is present at this stage such that we may be able to support the application of the GEIS to facilities in New York at a future time.

Regarding technology neutrality

For the first time, this draft GEIS uses a technology-neutral framework (GEIS at iii) along with a set of plant parameters (called plant parameter envelope or PPE) and site parameters (called site parameter envelope or SPE) to determine potential environmental impacts from construction, operation, and decommissioning of new nuclear reactors. As long as the nuclear reactor – whatever kind it is, and none are discussed in detail in the GEIS – meets the SPE and PPE listed for each potential impact, the public would have no right to additional information or legal challenge as to these environmental impacts once the GEIS is finalized. We note that this is a novel approach to an emerging industry, with little operational history from which to draw. We also note that the characterization here of this technology-neutral analysis as "performance based" where "performance reflects the ability of an applicant to design a nuclear reactor that minimizes environmental impacts while still meeting the reactor's objectives" (see GEIS at 1.2-1.3) is not consistent with NRC's standard use of the term "performance" as regarding nuclear facilities and wastes. See, e.g., NUREG-2150, Appendix D, which outlines NRC's risk-informed and performance-based defense-in-depth regulatory approach for reactors, materials, waste, fuel cycle, and transportation,[1] and the performance objectives of 10 CFR 61. We suggest that the Final GEIS address this apparent inconsistency.

The GEIS fails to provide sufficient information for the public to determine whether the basis of each assumption is sufficient such that it should form the basis for a permanent bar (for Category 1 impacts) on any further stakeholder input or challenge. In the land use section, for example, the GEIS says only that "In developing the values and assumptions in the PPE and SPE pertaining to land use, the staff relied upon the information and analyses contained in multiple new [unspecified] reactor EISs prepared since 2005 [none of which were presumably for advanced reactors], the License Renewal GEIS (NRC 2024-TN10161) [which did not evaluate advanced reactors], other past [unspecified] NRC EISs, and common elements of State and local land use regulation [which are also unspecified]." (bracketed text added). As such, it is not possible to ascertain the basis for these assumptions, which makes it difficult to comment on or evaluate the weakness or accuracy of the GEIS. We encourage the Staff to employ flexibility in the implementation of the GEIS when actual, on-the-ground circumstances may warrant the exploration of sufficient or additional information to enable host states, municipalities, and relevant stakeholders to understand potential impacts of even Category 1 issues once a specific design at a specific location is announced, even if the "new and significant" threshold cannot be met. We question

[1] "A performance-based regulatory approach is one that establishes performance and results as the primary basis for regulatory decisionmaking, and incorporates the following attributes: 1. measurable (or calculable) parameters (i.e., direct measurement of the physical parameter of interest or of related parameters that can be used to calculate the parameter of interest) exist to monitor system, including facility and licensee, performance, 2. objective criteria to assess performance are established based on risk insights, deterministic analyses, and/or performance history, 3. licensees have flexibility to determine how to meet the established performance criteria in ways that will encourage and reward improved outcomes, and 4. a framework exists in which the failure to meet a performance criterion, while undesirable, will not in and of itself constitute or result in an immediate safety concern."

how technology-agnostic criteria can be appropriate given the many differences among emerging technologies with a range of cooling options that spans light water, liquid sodium metal, molten salt, and high-temperature gas, and varying requirements for water consumption and discharge. Put simply, how can accurate accident or waste analyses be performed without specifying the reactor design?

Categories 1 and 2

The draft GEIS distinguishes between the potential impacts that would be common to many new reactors (100 Category 1 issues) and the potential impacts that would be unique, requiring project-specific analysis (20 Category 2 issues), as well as two impacts that are neither 1 nor 2. We support the Staff's decision to identify a large number of potential impacts as Category 2, where site-specific analyses are needed. In particular, we support the cumulative impacts analysis being categorized as a Category 2, because it appears likely that many SMRs may be sited on existing, operating nuclear reactor sites where analysis of complex scenarios would be important. However, we do not support the categorization of Design Basis Accidents Involving Radiological Releases as a Category 1 with SMALL significance finding/adverse effects. With the diversity of the new advanced reactor technology designs and the differences between these new reactors and current light water technologies, this should be listed as a Category 2 and a larger analysis of potential releases should be explored in the site-specific context. Additionally, we note that the high amount of necessary detail on so many factors in each site-specific supplemental EIS (SEIS) requires diligence and detail by the applicant and Staff, and we encourage the Staff to require meaningful stakeholder engagement by the applicant on each SEIS, including meetings with the host community.

Waste

The GEIS notes on page 3-127 that current NRC regulations require an applicant to minimize the generation of nuclear waste.[2] As to high-level waste, the GEIS states that "new reactor designs may not require onsite spent nuclear fuel storage, for example, in cases where the depleted core would be shipped offsite after a short period after shutdown (see Section 3.14 for away-from-reactor impacts during continued storage)" and that "[i]f spent nuclear fuel or any treated, reprocessed waste needs to be stored temporarily at a new reactor facility, it would be stored either in a spent fuel pool or in non-water-based spent nuclear fuel storage. After an appropriate holding period, it would be transferred to dry cask storage in an at-reactor ISFSI under a general license or a stand-alone ISFSI under specific license" (GEIS at 3-128). The GEIS cites to 10 CFR Part 72, which relates to "requirements, procedures, and criteria for the issuance of licenses to the Department of Energy (DOE) to receive, transfer, package, and possess power reactor spent fuel, high-level radioactive waste, power reactor-related GTCC waste, and other radioactive materials associated with the storage of these materials in a monitored

[2] *See* 10 C.F.R. 1406 ((a) Applicants for licenses … shall describe in the application how facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste.").

retrievable storage installation." But as the Commission is well aware, although federal law places the obligation to handle high-level waste on the federal government (42 U.S.C. §10101 et seq. (1982), there is currently no high-level waste repository available. Moreover, as of the date of this submission, federal courts have invalidated the Commission's ability to issue licenses to interim storage facilities such as those implicated by 10 CFR Part 72.[3] Should the United States Supreme Court side with the petitioners in those cases, there will, as a practical matter, be no place to which the waste can be relocated as contemplated in the GEIS, and each advanced reactor site will become a de facto long term waste storage installation.

At the same time, the waste generated by advanced reactors has not been the subject of extensive academic study, and current waste characteristics and generation projections are unreliable as there are no licensed, operating advanced reactor facilities to look to for their actual waste profile. But one such study, published in the Proceedings of the National Academy of Sciences and co-authored by former NRC Commissioner MacFarlane, found that the spent nuclear fuel from small modular reactors will be generated in greater volumes per unit of energy extracted and that its composition can be far more complex than the spent fuel resulting from existing power plants.[4] The authors evaluated nuclear fuel cycles for three distinct SMR designs, finding that "relative to a gigawatt-scale PWR, these reactors will increase the energy-equivalent volumes of SNF, long-lived LILW [low- and intermediate-level waste], and short-lived LILW by factors of up to 5.5, 30, and 35, respectively." Further, the authors found SMR waste streams will bear "significant (radio-)chemical differences" from those of existing reactors that will need costly treatment, conditioning and packaging to make them suitable for geologic disposal, introducing new pathways for radiation exposure. The authors conclude that similar neutron leakage characteristics inherent to most of the dozens of proposed SMR designs would render the waste "incompatible with existing nuclear waste disposal activities" and that future studies should assess "whether safe interim storage of reactive SMR waste streams is credible in the context of a continued delay in the development of a geologic repository in the United States" (n.3 at p10). Yet for this GEIS, the NRC staff assumes that the quantities of LLRW generated at a new reactor would be less than the quantities of LLRW generated at existing nuclear power plants (GEIS at 3-127); while this may be true, this is only because the facilities are much smaller – the waste generated by certain advanced reactors appears to be higher per output than existing facilities, posing a problem for the aggregate collection of waste across the country should these facilities be built out in large numbers. In light of this credible information, we cannot agree with the GEIS's assertion that existing radiological waste infrastructure and management programs could "likely support the additional radiological wastes generated by a new reactor" (see 3-126) and request that the final GEIS acknowledge the findings of Krall et al. We also strongly encourage the Commission, pursuant to 10 CFR Part 1406, to require mitigation measures for adverse waste impacts in all environmental reviews, and condition licenses on the minimization of

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[3] See, e.g., *U.S. Nuclear Regulatory Commission et al. v. State of Texas et al.* and *Interim Storage Partners LLC v. Texas et al.*, before the Supreme Court at the time of this writing as *NRC v. Texas*, No. 23-1300.

[4] Krall, et al., *Nuclear waste from small modular reactors.* Proceedings of the National Academy of Sciences: Vol. 119, No.23 (June 7, 2022). Available at https://doi.org/10.1073/pnas.2111833119

waste. But in light of this information, which has not been explored in the GEIS, we also request that waste management be changed from a Category 1 to a Category 2 issue, such that the treatment plans for waste generated from new/advanced reactors can be understood once such designs are available.

Generalized Comments

It is the State's understanding that the GEIS for Licensing of New Nuclear Reactors cannot be relied upon by applicants seeking extension of existing nuclear facility licenses because the Commission has recently released its Revision 2 to NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants", which is specifically targeted at license extension regardless of the reactor design. Yet applicants seeking to build new reactors of the same design may rely on the GEIS for Licensing of New Nuclear Reactors. This creates a paradox wherein licensees seeking to extend a reactor license or build a new reactor may rely on differing GEIS frameworks even if the reactor design and the reactor site are the same in both cases. We suggest that the Staff clarify in the Final GEIS why this distinction is appropriate and is not arbitrary.

We would also suggest that the final GEIS provide further clarity on how the draft GEIS takes into account the modular nature of Small Modular Reactors (SMRs) and the resulting potential cumulative impacts from multiple reactor modules being installed over time at the same site. For example, it is not clear how the GEIS would evaluate multi-module reactor designs where additional modules may be added to the same site in the future without a new license and thus, without a new GEIS/cumulative impacts analysis. It would be our expectation that a subsequent SEIS would be performed, should the number of reactors (along with the accompanying volume of fuel and then waste) at any site change after the licensing decision.

Finally, on page 3-1, the Staff write: "The site might be situated at an existing nuclear power plant property, and, if so, the generalized description of the affected environment at an existing nuclear power generation site presented in the License Renewal GEIS (NRC 19 2024-TN10161) might be informative." Insofar as this comment suggests that licensees may be able to cross-reference back to the License Renewal GEIS instead of presenting the description of the affected environment in an SEIS, we strongly encourage Staff to require all applicants to provide a new description of the affected environment in all SEISs, even if repetitive of information in the License Renewal GEIS, and not to require stakeholder and site host states and municipalities to dig through dense prior NRC reports to obtain all information needed to understand the impacts of a proposed new reactor.

Thank you for the opportunity to comment. If you have any questions or concerns, please contact me.

Sincerely,

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State Liaison Officer - Designee
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cc: Doug Tifft, State Liaison Officer, NRC