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LAW SCHOOL

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Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
ATTN: Rulemakings and Adjudications Staff

**RE: Public Comments on Waste Confidence Environmental Impact Statement
ML1322A4106 / NUREG-2157**

Dear Commissioners:

The Columbia Center for Climate Change Law (“CCCL”)¹ submits these comments on the Commission’s Waste Confidence Draft Generic Environmental Impact Statement, Draft Report for Comment, dated September 2013 (“DGEIS”).

CCCL’s comments are limited to two principal issues concerning the DGEIS’s analysis of the effects of future climate change on the storage of spent nuclear fuel: (1) the NRC’s limitation of its analysis to only the “short-term timeframe” of 60 years, and (2) the sea level rise projections used in the DGEIS.

Analysis Year

The brief discussion of the effects of future climate change on spent nuclear fuel storage is found in Section 4.18.1 of the DGEIS (“Natural Phenomena Hazards”), beginning on page 4-75. Although the DGEIS acknowledges that climate change “may have impacts across a wide variety of resource areas including air, water, ecological, and human health,” the DGEIS nevertheless states, without any explanation, that “[t]he consideration of climate change impacts for pool storage only needs to address the short term timeframe.” DGEIS 4-75. Given that (a) spent nuclear fuel remains dangerously radioactive well beyond 60 years,² and (b) the prospects of a completed and operational permanent waste repository for spent nuclear fuel within 60 years are

¹ The Columbia Center for Climate Change Law is an academic center at Columbia Law School. CCCL develops legal techniques to fight climate change, trains law students and lawyers in their use, and provides the public with up-to-date resources on key topics in climate law and regulation. CCCL works closely with the scientists at Columbia University’s Earth Institute and with governmental, nongovernmental and academic organizations. CCCL is directed by Michael B. Gerrard, the Andrew Sabin Professor of Professional Practice at Columbia Law School. See <http://web.law.columbia.edu/climate-change>. This comment letter incorporates by reference all publicly available sources cited. If the Commission cannot locate any sources, please contact CCCL.

² The half lives of two components of spent nuclear fuel, plutonium-239 and plutonium-240, have half lives of 6,800 and 24,000 years, respectively. See, e.g., Nuclear Regulatory Commission, “Radioactive Waste: Production, Storage, Disposal,” at 8, available at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0216/r2/br0216r2.pdf>.

speculative, artificially limiting the analysis to the short term cannot be considered the “hard look” required by NEPA.

Indeed, the DC Circuit, in *New York v. Nuclear Regulatory Commission*, expressed skepticism whether permanent waste storage would be available within 60 years, stating “[t]he Commission apparently has no long-term plan other than hoping for a geologic repository. If the government continues to fail in its quest to establish one, then [spent nuclear fuel] will seemingly be stored on site at nuclear plants on a permanent basis. The Commission can and must assess the potential environmental effects of such a failure.” 681 F.3d 471, 479 (D.C. Cir. 2012).

By limiting its generic analysis to only 60 years, the NRC bases its analysis on nothing more than hope, and therefore failed to take the hard look required by NEPA. In order to satisfy its obligations under NEPA, the NRC must either convincingly explain why 60 years is a reasonable timeframe for analysis, or expand the timeframe for analysis to a period that reasonably reflects the availability of permanent waste storage. Brushing off the inquiry as speculative or unlikely is not sufficient.

“[O]ne of the functions of a NEPA statement is to indicate the extent to which environmental effects are essentially unknown.... Reasonable forecasting and speculation is thus implicit in NEPA, and we must reject any attempt by agencies to shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as ‘crystal ball inquiry.’” *Scientists’ Inst. for Pub. Info., Inc. v. Atomic Energy Comm’n*, 481 F.2d 1079, 1092 (D.C. Cir. 1973); *see also N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1079 (9th Cir. 2011) (same). While the NRC may hope that a permanent repository for spent nuclear fuel is operational in 60 years, given the history and status of Yucca Mountain, notwithstanding directives of Congress, that belief is not universally held.

As set forth below, the length of time waste is stored at individual nuclear plants is not an academic issue, since the projected effects of climate change, in particular sea level rise, will only increase over time, particularly when dealing with waste whose danger and potential environmental harm is measured in many thousands of years.

Sea Level Rise Projections

The only discussion in the DGEIS of the potential effect of sea level rise on the numerous spent nuclear fuel storage facilities throughout the country is the following:

Rise in sea level is controlled by complex processes, and it is estimated to rise less than 1 m by 2100 (75 FR 81037). Based on this projected change, none of the U.S. nuclear power plants (operational or decommissioned) will be under water or threatened by water levels by 2050 (75 FR 81037). In addition to sea-level rise, spent fuel facilities may be affected by increased storm surges, erosion, shoreline retreat, and inland flooding. Coastal area impacts may be exacerbated by land subsidence. NRC-licensed spent fuel storage facilities are designed to be robust.

DGEIS at 4-75.³ There are several problems with this “analysis.” First, merely stating that sea levels are estimated to rise less than one meter by 2010 does not account for uncertainty in sea level rise projections and may underestimate risk. Second, merely accounting for a static sea level rise does not consider risks due to more frequent and severe flooding. Finally, simply stating, without further discussion or support, that NRC design standards are sufficient to protect from future climate harm, does not satisfy NEPA.

The only source cited for sea level rise projections in the DGEIS is the NRC’s own Federal Register notice for its 2010 Waste Confidence Rule, which itself cites to a National Academy of Sciences transportation report, a 2001 report of the International Panel on Climate Change (“IPCC”), and the 2009 United States Global Change National Climate Assessment. *See* 75 FR at 81053. Aside from the fact that the 2010 Waste Confidence Update was vacated by the DC Circuit, the sources referenced are dated, and more recent projections show potentially greater sea level rise and uncertainty.

For instance, the current draft of the National Climate Assessment, which is in the process of updating the 2009 report cited in the NRC’s 2010 Federal Register notice, indicates that sea levels could rise as much as 6.6 feet by 2010, *double* what is considered in the DGEIS. The Draft Assessment indicates that “[i]n the context of risk-based analysis, some decision makers may wish to use a wider range of scenarios, from 8 inches to 6.6 feet by 2010.”⁴ The report continues that “the high end of these scenarios may be useful for decision makers with a low tolerance for risk.” *Id.* Certainly, nuclear waste storage epitomizes an area where there is a “low tolerance for risk.”

Additionally, the DGEIS discussion only looks at static flood levels due to potential sea level rise, which does not accurately disclose the risk of flooding. If the base sea level rise is higher, then flooding at many locations will occur more frequently, and those locations will be more vulnerable to more powerful and frequent storm surges. The NRC’s casual and generic dismissal of potential sea level rise on every waste storage facility in the country does not properly characterize potential risk, and does not constitute a hard look under NEPA.

Additionally, sea level rise is not uniform and will vary considerably among different regions. *Id.* *See also* New York City Panel on Climate Change, *Climate Risk Information 2013*, June 2013, at 17. The NRC has not explained why its generic, one-size-fits-all analysis here is appropriate.

In discharging their NEPA responsibilities, agencies are subject to a “rule of reason,” and must evaluate all reasonably foreseeable significant adverse impacts. When data is incomplete or unavailable, as it is with future sea level rise projections “reasonably foreseeable” includes “impacts which have catastrophic consequences, even if their probability of occurrence is low,

³ The Proposed Rule does not address the effects of climate change on spent fuel storage. *See* 78 Fed. Reg. 56776, Sept. 13, 2013.

⁴ National Climate Assessment, Chap. 2, “Our Changing Climate,” p. 63, Draft for Public Comment, v. 11, Jan. 2013. The recent Working Group 1 Contribution to the Fifth Assessment Report of the IPCC, “Climate Change 2013: The Physical Science Basis,” Summary for Policymakers, acknowledges that many models project such higher sea level rise, but indicates that consensus on the reliability of those models is lacking, and has low confidence for those projections. IPCC WG1 2013 Summary for Policymakers, at 24.

provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.” 40 CFR § 1502.22. Clearly, the consequences of underestimating potential sea level rise and storm surge could have catastrophic consequences. In the face of this incomplete or unavailable data, NEPA requires that the NRC consider greater potential sea levels based on existing credible scientific evidence.

This conclusion is bolstered by the fact that a number of coastal nuclear plants are located in densely populated areas. Although the DGEIS states that the majority of U.S. nuclear power plant sites are located in relatively sparsely populated areas (DGEIS at 2-4), the Indian Point plant in New York, located on the tidal Hudson River and subject to storm surge from coastal storms, has the largest nearby population density in the United States, and among the highest in the world. *Id.*; Declan Butler, “Reactors, residents, and risk,” *Nature*, Apr. 21, 2011, *available at* <http://www.nature.com/news/2011/110421/full/472400a.html>. Moreover, the DGEIS’s blanket statements about low population density obscures the fact that many low-lying, potentially vulnerable plants are located in densely populated areas. For instance, several U.S. coastal or riparian reactors located below ten meters in elevation have surrounding populations between 2 and 10 million people within 75 km, and one (Indian Point), has nearly 20 million.⁵

Finally, the only assurance in the DGEIS that all storage facilities will be safe from rising seas and other effects of climate change is the statement that “NRC-licensed spent fuel storage facilities are designed to be robust.” DGEIS at 4-75. While waste storage facilities are no doubt required to be robust, simply saying so does not constitute the hard look required by NEPA. The DC Circuit similarly viewed with skepticism the Commission’s self-serving assurances of robust design and administrative oversight:

[T]he Commission refers to its monitoring and regulatory compliance program as a buffer against pool degradation. That argument is even less availing because it amounts to a conclusion that leaks will not occur because the NRC is ‘on duty.’ With full credit to the Commission’s considerable enforcement and inspection efforts, merely pointing to the compliance program is in no way sufficient to support a scientific finding that spent-fuel pools will not cause a significant environment impact during the extended storage period. This is particularly true when the period of time covered by the Commission’s predictions may extend to nearly a century for some facilities.

New York v. Nuclear Regulatory Comm’n, 681 F.3d at 481.

⁵ Center for International Earth Science Information Network (CIESIN), Columbia University, *Low Elevation Coastal Zone (LE CZ) Urban-Rural Population and Land Area Estimates, Version 2*, Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC), *available at* <http://beta.sedac.ciesin.columbia.edu/data/set/lecz-urban-rural-population-land-area-estimates-v2>, accessed Dec. 17, 2013; Declan Butler, “Reactors, residents, and risk,” *Nature*, Apr. 21, 2011, *available at* <http://www.nature.com/news/2011/110421/full/472400a.html>. *See also* Bobby Magill, “Sandy a Warning Rising Seas Threaten Nuclear Plants,” *Climate Central*, Oct. 21, 2013, *available at* <http://www.climatecentral.org/news/sandy-a-warning-that-nuclear-plants-threatened-by-rising-seas-16622>.

In sum, the DGEIS is insufficient in its consideration of how future climate change will affect the long-term storage of spent nuclear fuel. Thank you for the opportunity to submit comments on the Waste Confidence DGEIS.

Sincerely,

/S/

Ethan Strell