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General Comment

See attached file(s)

Attachments

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Comments of the Union of Concerned Scientists on
The NRC's Systematic Assessment for How it Addresses
Environmental Justice in its Programs, Policies, and Activities
NRC-2021-0137

Edwin Lyman
Director of Nuclear Power Safety
October 29, 2021

The Union of Concerned Scientists commends the NRC for undertaking a wide-ranging review of how it addresses environmental justice (EJ) in its programs, policies, and activities. Such a review is badly needed and long overdue.

The NRC's regulatory processes have baked-in assumptions and biases that lead to outcomes that discriminate against disadvantaged communities. The NRC's current consideration of EJ, which is confined only to its National Environmental Policy Act (NEPA) reviews of agency actions, is largely a box-checking exercise that has proven incapable of uncovering and fully assessing these discriminatory outcomes, much less remediating them. We provide some examples below. The NRC staff should do the work to uncover all others.

1. Fundamentally, the agency's arguably false assumption that the radiological releases from reactor core meltdowns would only pose negligible radiological risk allows the agency to discount potential health impacts from exposure to ionizing radiation to all segments of the population, and thus is not sensitive to the disproportionate impacts of such events on communities of color and other disadvantaged communities.

This is clearly illustrated by the cursory EJ analyses that appear in NEPA assessments of agency actions that clearly have disproportionate impacts on disadvantaged groups. For example, the Final Environmental Impact Statement for an Early Site Permit for the Vogtle Units 3 and 4 in Burke County, Georgia (NUREG-1872,Volume 1, August 2008) states that "the staff found low-income, Black, Hispanic, and aggregated minority populations that exceed the percentage criteria established for environmental justice analyses …" but that "there would be no significant adverse health impacts [from accidents] on members of the public, and therefore, there would be only minimal negligible health impacts on minority and low-income members of the public." That is, although the health consequences may be higher for some groups than others, it simply doesn't matter because they are low for everyone. However, whether or not the statement that only "minimal negligible" health impacts could occur in an **absolute** sense is accurate—and we do not agree that it is—this analysis simply fails to evaluate the **relative** and potentially disproportionate health impacts on disadvantaged populations that would result from radiological releases and contamination of the environment. A large radiological release could result in tens of thousands of cancer deaths, and disadvantaged populations could suffer thousands more. NRC staff could, and should, use available tools to quantitatively assess and report these relative impacts.

2. The methods and assumptions that the NRC uses for assessing the consequences of radiological releases are inherently discriminatory. Perhaps the biggest culprit is the NRC's use of a "value of a statistical life" (VSL), a.k.a. the "dollar per person-rem" that is averaged over the entire population. This parameter, currently assigned a (shockingly low) value of $2,000 per person-rem, is established through use of a "nominal" radiation coefficient for the fatal cancer and heritable risks resulting from ionizing radiation exposure, which is averaged over sex and age of exposure. This unit, which is the monetary cost associated with the health risk resulting from an individual's exposure to a given quantity of ionizing radiation—is inherently discriminatory because it doesn't take into account statistically significant disparities in health outcomes among different subpopulations—not only with respect to gender and age but also with respect to race, income, and other distinguishing factors. Simply put, one rem of exposure to ionizing radiation is not the same for every person and will have disproportionately severe health impacts on members of disadvantaged groups.

For example, use of an average VSL does not allow the NRC's regulatory analyses to take into account the higher ratio of cancer mortality to cancer incidence among Black people compared to White people in the United States, as documented in the *American Cancer Society's Cancer Facts and Figures for African-Americans, 2019-2021*, which plainly states that "collectively, Blacks have the highest death rate and shortest survival of any racial ethnic group in the U.S. for most cancers."[1] In addition, the VSL does not take into account cardiovascular diseases—another health endpoint associated with ionizing radiation exposure. Although the impacts of low-level exposure on cardiovascular diseases are less well-understood than for cancer, this omission could potentially have a disproportionate impact on Black people in the U.S., who suffer from significantly higher mortality rates from heart disease than Whites.[2]

3. Another way in which the NRC's regulatory analysis guidelines promote discriminatory outcomes is that the methodology for estimating the economic consequences of nuclear accidents values high-income people and the property they own more than it values low-income people. The NRC uses this methodology for in a variety of applications, both in NEPA evaluations (Severe Accident Mitigation Alternatives and Severe Accident Mitigation Design Alternatives), and safety analyses (such as backfit rule determinations). In these applications, the monetary "benefits" of a proposed nuclear plant safety improvement are calculated in terms of the avoided cost associated with the resulting reduced risk of accidents. This avoided cost includes the economic value of the averted cancer deaths (using the dollar per person-rem value described above) and the offsite economic cost, which includes the costs of protective actions, including decontamination to restore land to habitability (NUREG/BR-0058, Appendix H). For example, consider two pieces of property with values X and Y, where Y > X. If the projected cost of decontamination (D) of the property exceeds the value of the property X, then the property is

[1] https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/cancer-facts-and-figures-for-african-americans/cancer-facts-and-figures-for-african-americans-2019-2021.pdf

[2] https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=19

considered condemned; if D is less than the property value Y, then the property is decontaminated and returned to habitability. In the former case, the additional cost of the accident associated with the property is the property value X; in the latter, it is the decontamination cost D. Since X < D, the averted cost of an accident affecting the property with lower value is less than the averted cost affecting the higher-value property. Since this averted cost is then compared with the cost of the safety improvement to determine if the improvement is cost-justified, this process nonsensically leads to a result in which a safety improvement to a reactor located in an area with higher property values would be cost-justified, whereas the same safety improvement would not be worth the cost in an area with lower property values.

Evaluating the extent to which this structural defect has led to discriminatory outcomes in past NRC regulatory decisions is not straightforward, as many other factors come into play. The agency should do a comprehensive review to assess whether it has had an impact. In any event, the NRC should systematically review the methodology which it uses to calculate accident cost, as well as other aspects that could have similar flaws, and revise the methodology accordingly.

4. A quick review of how the NRC uses radiological risk in licensing and other regulatory decisions uncovers many other ways in which treating one rem of exposure as the same for everyone could lead to discriminatory treatment. And discriminatory outcomes based on this fallacy have the potential to become even worse as the NRC continues its so-called transformation to being a more "risk-informed" regulator, relying even more heavily on the results of probabilistic risk assessments and estimates of public dose in decision-making. One example is new reactor siting, in which the distance of a new reactor from a densely populated area is based on the potential dose that an individual could receive at such a distance in the event of a design-basis accident. The NRC is currently considering reversing long-standing policy and allowing the siting of new reactors in densely populated urban areas—based on estimated doses following an accident to members of the public who remain in their homes (presumably because they do not have the means to self-evacuate). Such policies could obviously disproportionately impact communities of color and other disadvantaged groups.

5. There are more subtle but still significant ways in which proposed policy changes could disproportionately impact disadvantaged groups. For instance, the NRC's proposed rule on emergency planning zone size for new reactors could absolve reactor owners of any responsibility for offsite radiological emergency planning, leaving communities stuck with the full burden of protecting their residents in the event of a nuclear accident. High-income communities will have more resources to take on this responsibility than low-income ones. The NRC should review every new regulatory proposal through the EJ lens to detect and evaluate such potentially discriminatory effects.