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December 13, 2013

Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-001

Attn: Rulemakings and Adjudications Staff

Re: NRC NUREG-2157

We appreciate the opportunity to comment on the above proposed regulation, known as the Waste Confidence Generic Impact Statement.

In our comments below, we present two major lines of concern:

(1) While the EIS framework has a long history in addressing environmental impacts, it may be inappropriate for risk assessment of spent nuclear fuel hazards over decades. Thus, even the most thorough EIS could be irrelevant to the critical issues at hand.

(2) The findings of the GEIS appear to seriously understate (a) generic levels of risk in storing spent nuclear fuel on-site at decommissioned reactors; (b) specific risk factors arising from characteristics of specific sites; (c) risk differentials of long-term or indefinite storage on-site rather than at a remote geologic repository; (d) added risks of on-site storage created by the use of high burn-up fuel.

We recognize that development of this GEIS was undertaken as a required response to the June 8, 2012 finding of the U.S. Court of Appeals., D.C. Circuit, that the NRC needed to more fully address impacts in two areas: "failing to secure permanent disposal for spent nuclear fuel" and "potential spent fuel pool leaks and spent fuel pool fires."

Regarding permanent disposal, the NRC definition of "Waste Confidence" in NUREG-2157 reads as follows: "Waste Confidence applies to the storage of spent fuel *after* the end of the licensed life of a nuclear reactor and *before* disposal in a permanent repository."

The Waste Confidence criterion applies to an interim phase in a complete cycle of nuclear fuel storage. Thus, lack of a permanent repository as the end point makes development of

an adequate Waste Confidence policy vastly more difficult and perhaps conceptually impossible.

We recognize that the current lack of a repository arises not from NRC policy, which has tended to be supportive, but primarily from difficulties in gaining political and public approval for even a single repository site.

Sierra Club policy on geologic storage at one or more remote and isolated sites was adopted by its Board of Directors on May 5, 1984. The policy statement begins, "To reduce the grave and unacceptable risks posed by the existing and continued production of high-level nuclear waste without a demonstrated means of final disposition, the Sierra Club supports federal assumption of responsibility for the long-term, least hazardous isolation of spent nuclear fuel and high-level wastes."

Six numbered paragraphs follow. They spell out appropriate procedures for identifying one or more repository sites on the basis of geologic and environmental suitability, and they detail procedures for least hazardous transport of waste to a repository.

The Sierra Club policy speaks of "attainment of the fundamental safety objectives central to the federal nuclear waste isolation program." At no point does it suggest that waste storage at a retired nuclear plant site could qualify as a repository.

Our review of the draft Waste Confidence GEIS finds the following concerns:

1) <u>The GEIS framework may not be adequate or appropriate for nuclear risk assessment.</u> EIS analyses focus upon impacts of proposed human activity on the environment. Yet hazards related to nuclear plant operations and to spent fuel storage can be profoundly affected by the reverse; i.e., impacts of the environment upon a facility.

The earthquake, tsunami, and subsequent nuclear emergency at Fukashima demonstrate this sequence, with negative interaction between the environment and the facility that continues. This example applies most clearly to reactors in active earthquake zones but all reactors are sited near water, and earthquakes can strike at widely varied points in the U.S. including the national record 8.5 magnitude quake at New Madrid, Missouri in 1835.

Another shortcoming of the EIS process is that it focuses on specific forms of environmental degradation resulting from human activity within predictable and relatively immediate time periods. It is not designed to assess systemic risk arising from a range of factors, including those that could precipitate emergency events, over indefinite time periods.

2) <u>The GEIS risk analysis of on-site storage is not credible regarding either the generic level of risk or site-specific factors affecting risk.</u> Table ES-3 in NUREG-2157 summarizes the likely at-reactor impacts on 24 environmental factors during short-term, long-term, and indefinite storage of spent nuclear fuel.

Applying the time scenarios (3) to the environmental factors (24) results in 72 assessment points. Five of every six impacts - 60 out of 72 - are rated as "Small," including all impacts on land use, climate change, geology and soils, surface-water quality and use, groundwater quality and use, aquatic ecology, noise, waste management of low-level, mixed and non-radioactive waste, public health, accidents, and sabotage or terrorism.

"Small to Moderate" impacts are projected for short-term air quality, short-term terrestrial resources, and traffic during short, long, and indefinite storage. "Small to Large" impacts are projected on historical and cultural resources; i.e. disruption at sites that have these values. "Large" impacts are projected in only one case - "beneficial" socioeconomic impacts.

Such low levels of estimated impact do not square with widely held concerns of both the public and experts regarding indefinite on-site storage of waste. These concerns arise from the inherently higher risk levels related to accidents, terrorism or sabotage at sites that are neither isolated nor remote from urban areas or water. Additional concerns relate to aesthetics and suitability of land use given waste storage configurations that many see as inherently grotesque or problematic.

This relates to the question of what if any beneficial or non-compromised land uses are currently occurring at the dozen decommissioned reactor sites that have been unconditionally released by the NRC in the past decade.

To illustrate these concerns, here are two quotes from nationally-regarded experts who spoke on October 19 at a community symposium organized by the Sierra Club and other groups to inform the public on issues related to the closure of the San Onofre nuclear power plant.

Marvin Resnikoff, Senior Associate, Radioactive Waste Management Associates: "Edison has said spent fuel will be removed from the pool by 2034. After that, San Onofre will consist entirely of fuel casks or silos in a Stonehenge configuration. San Onofre has a "blockhouse" arrangement of 176 modules, including 10 for the reactor. What remains? A fuel mausoleum and the conversion of a valuable site into a wasteland."

Arjun Makhijani, President, Institute for Energy and Environmental Research: "The best kind of on-site storage has these characteristics: low visual signature ("low to the ground"), which may include berms; the best casks, which currently may be the triple-top German model; and the best seismic science on withstanding earthquake shocks.

"The practical problems in storing or reprocessing waste are severe. If spent fuel stored on site cannot be transferred to a remote site, it will be necessary over time to transfer fuel from one cask to another. No one knows how to do this, especially if the casks are damaged."

Moreover, as a generic statement, the analysis makes no distinctions among the dozens of sites covered by the EIS with regard to such factors as levels of seismic risk (earthquakes and tsunamis), regional population levels, size of site and isolation of site, and proximity to

transportation corridors. Rather, it assumes an identical level of risk at all sites regardless of specific characteristics.

3) <u>The key risk analysis makes almost no distinction between levels of risk involved in on-site and remote storage.</u> Table E-4 applies the methodology used in E-3 to remote storage, using the same three timeframes and 24 environmental factors.

The levels of environmental impact for spent fuel storage at remote (away-from-reactor) sites are shown as identical to on site-storage, with one exception: Aesthetic impacts rate as "Small" for on-site storage and "Small to Moderate" for remote storage.

In summary, the draft Generic EIS finds essentially no difference between on-site and remote storage from an environmental impact perspective, and rates impacts as "Small" in over 80 percent of the data points.

Arjun Makhijani comments: "A worst-case event on the surface, especially in a sensitive area like San Onofre, is an order of magnitude more severe than worst-case in deep geologic storage, Our goal should be to store waste in a way where the worst-case is not catastrophic.

"For that reason, we need a deep geological repository. We have done a terrible job on a national repository in this country. We need to work on a repository. All other solutions are much less adequate."

Within the environmental community a level of unease has arisen from the sense that as isolated storage proved difficult to site, the GEIS exercise was undertaken to present on-site storage as equally safe and appropriate, thereby reducing or removing any sense of urgency in siting a remote geologic repository.

<u>4) The low levels of risk reported in the GEIS do not reflect emergent concerns about the challenge of handling high burn-up fuel.</u>

The above critique suggests that we find the GEIS approach fundamentally misconceived as a response to the Waste Confidence challenge.

The stakes on applying adequate criteria to on-site storage have been raised by the revelation that high burn-up nuclear fuel has been used for an extended period at locations such as San Onofre. This fuel is hotter both thermally and radioactively, thus increasing both the risk of storage on-site and the difficulties of transport to a remote site.

Marvin Resnikoff comments: "We should be very concerned about the challenge of storing high burn fuel. There is the timing issue of a long cool-down period for fuel used at 67 megawatt-days per metric ton. How did San Onofre get permission to operate at this level? The question has not been analyzed and San Onofre has put little or no high burn fuel in storage. Indeed, no form of storage has yet been approved for fuel this hot."

This issue needs maximum attention. We await with interest the outcome of the NRC's technical workshop on storage of high burn-up fuel, held in Washington on November 18-19, 2013.

The discovery of high burn–up fuel use, until recently unknown to the concerned public, might qualify as a "game-changer" if it had been assumed – as we do not – that on-site storage of spent fuel is a viable option. This has never been the case but the challenge of handling high burn-up fuel makes inescapably obvious the inherently dubious attempt to qualify indefinite on-site storage as an environmentally responsible alternative.

Given the total context, the GEIS approach is at best a default position in response to the difficulty of siting a national repository. More fundamentally, the EIS process appears unsuited to assessing the realities of managing long-term nuclear waste storage generally, and specifically in an era of high burn-up fuel use.

Our bottom line conclusion: There remains no alternative but to continue the hard and necessary work of work "creating a safe, long-term solution for managing and disposing of the nation's spent nuclear fuel and high level radioactive waste," in the words of the NRC's Blue Ribbon Commission, which reported in January 2012.

The BRC report recommends "immediate efforts to commence development of at least one geologic disposal facility and at least one consolidated storage facility, as well as efforts to prepare for the eventual large-scale transport of spent nuclear fuel and high-level waste from current storage sites to those facilities."

We commend and endorse the Blue Ribbon Commission position and we suggest that the GEIS, in concept and as drafted, is neither compatible with nor supportive of this wise and well-considered approach.

Thank you for consideration of our views.

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