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Yucca Mountain Tunnel

(<http://www.yuccamountain.org/image/tunnel02.jpg>)

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A New Level of Hazardous Risk 2005 EPA Standards for Yucca Mountain

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FACT SHEET

Background

Based on the National Academy of Sciences (NAS) recommendations, Congress agreed that geologic disposal was the safest option available for dealing with high-level nuclear waste. Per this understanding, Congress designated the Department of Energy (DOE) as responsible for the development and operation of a permanent high-level nuclear repository and designated the Environmental Protection Agency (EPA) and the Nuclear Regulatory Commission (NRC) to share responsibility for regulating the program and to ensure protection of public health and safety.

Through the Energy Policy Act of 1992, Congress required of EPA that its public health and safety standards be "based on and consistent" with the recommendations of the NAS.

This includes:

- EPA radiation protection standards must comply with the risk standard for radioactive waste and be applied at the time of peak risk, whenever it occurs.
- Intergenerational equity must be recognized and protected by considering health and safety protections during periods longer than 10,000 years.

Original EPA Standards for Yucca

EPA first released its standards in 2001. These were criticized widely and legally challenged by the State of Nevada and various environmental groups for being contrary to the recommendations of NAS. The standards would only cover the first 10,000 years for the repository operation, ending well before the peak risk period. NAS explicitly rejected this 10,000 year cut-off time as arbitrary and said that the standards must be met at the "time of peak risk, whenever that occurs... [and which] might occur tens to hundreds of thousands of years or even farther into the future."⁽¹⁾

Even DOE has publicly estimated radiation doses of 250 millirem per year at 200,000 to 300,000 years in the future. For this reason, in 2004 the U.S. Court of Appeals in DC ruled that EPA must develop new standards that would adequately protect public health for up to 1 million years.

“a radiation exposure-limit of 350 millirem/yr is a 2,300% exposure increase over what is permitted for the first 10,000 years”

The EPA proposed rule does not account for the disproportionate radiation level exposure risks to children

Revised EPA Rules

Following the court’s order, EPA issued a revised set of rules in August 2005. EPA’s proposed new rules include:

- Two-tiered standard that covers radiation limits at 15-25 millirem/yr out to 10,000 years
- Opens up the radiation protection limit to 350 millirem/yr for any time beyond the 10,000 years up to 1 million years.

EPA is presently finalizing these rules after having received public comments.

Cause for Concern

Standards Themselves

EPA’s 2005 standards are worse than its original proposal and represent a dramatic reversal of U.S. and international public health standards. EPA’s new rules propose a “two-tiered standard system.” For the first 10,000 years, EPA rules permit a 15 millirem/yr dose limit from Yucca. But beyond 10,000 years, EPA sets a radiation exposure-limit of 350 millirem/yr, a 2,300% exposure increase over what is permitted for the first 10,000 years. (2) For decades EPA has argued that any radiation dose above 15-25 millirem/yr is “non-protective of public health” and that doses above 100 millirem/yr produce unacceptable levels of risk. A 350 millirem/yr exposure limit, albeit for future generations, is unconscionable and vastly outside what even the current EPA rules suggest is dangerous to public health. This dosage over one’s lifetime, according to recent NAS reports on radiation risks, will cause cancer in approximately one out of every twelve people exposed. This is vastly outside the 1-in-10,000 to 1-in-a-million risk range EPA has used as a basis for establishing radiation exposure limits.

Other Problems with the EPA 2005 Standards

Method of Assessment

EPA’s new rules also propose using two different methods for assessing regulatory compliance: the first 10,000 years will be measured using the arithmetic mean, while beyond that they will use a median dose. By switching to a median dose, half of the radiation scenarios could result in doses grossly exceeding 350 millirem/yr. In fact, by using the median dose method, half of the population could suffer from having no maximum limit for exposure. This median dose distribution method for risk assessment is so flawed that it has been rejected by scientists worldwide.

Children’s Health

The EPA proposed rule does not account for the disproportionate radiation level exposure risks to children. It is widely understood that “children suffer disproportionately from environmental health risks and safety risks” (Executive Order 13045 EPA 2005), meaning the same dose of radiation will produce more cancers in kids than adults. This omission is out of order with Executive Order 13045 on Children’s Environmental Health which requires such attention by federal agencies.

“Background” Exposure

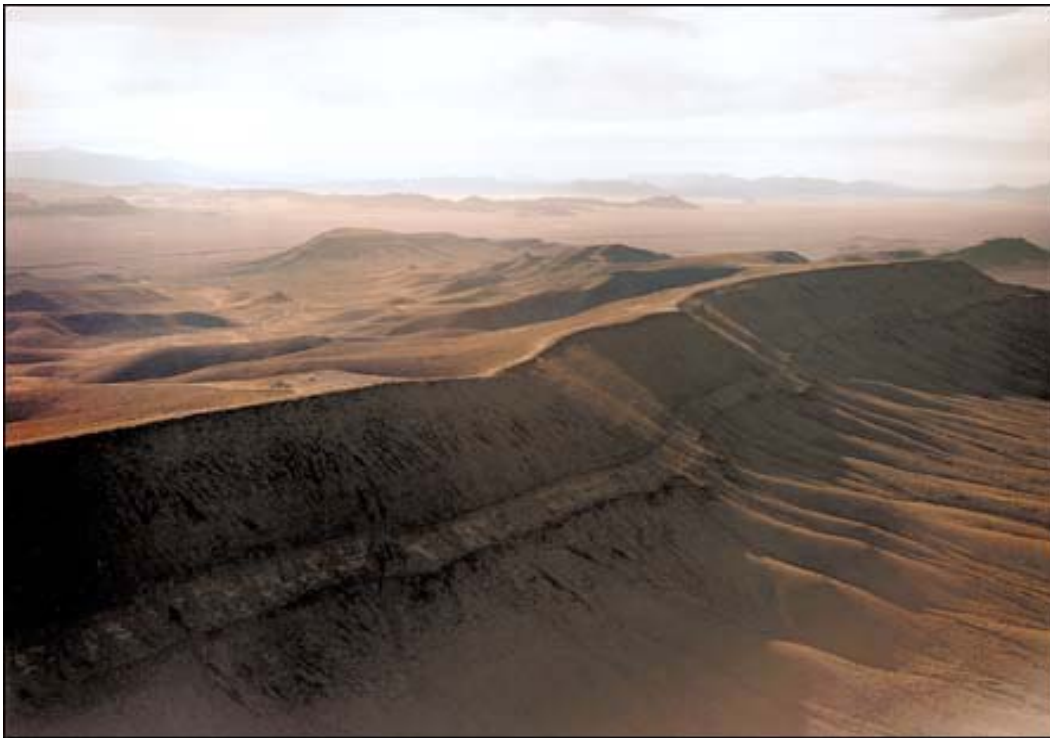
EPA defends its 350 millirem/yr exposure limit as an acceptable level of risk because it is only slightly higher than what some people already receive from natural-background radiation. While that number is already skewed by the presence of radon, EPA’s proposed rule does not take into account that the radiation received from Yucca will be in addition to, not in place of, background radiation. Furthermore, these doses of radiation would not be momentary and then recede to lower levels. Instead they would be allowed to occur for thousands of generations. (3) Moreover, in a recent report, the NAS declared that no dose of ionizing radiation is completely safe, no matter how small or how natural. (4)

Intergenerational Equality

EPA's proposal for a two-tiered radiation protection standard and two different methods for assessing regulatory compliance is not only scientifically questionable, it is also unethical and a gross violation of current EPA regulations and internationally accepted public health norms that guarantee *all* individuals *equal protection* against all radiation exposure above the legal limit without an arbitrary division at 10,000 years.

Water Quality Protection

The 2005 EPA proposed rules are not in compliance with the current Safe Drinking Water Act, which limits radiation in drinking water to 4 millirem/yr. If approved, this standard will only be required for the first 10,000 years. Beyond that, EPA switches to a 350 millirem/yr all pathway exposure limit. This means that much higher levels of radiation could be allowed in drinking water. Yucca Mountain is above an aquifer; the radioactive wastes, which will remain hazardous for hundreds of thousands of years, could likely leak into this underlying water source, which will become the primary pathway for harmful doses of radiation to people "downstream" and throughout the arid west.



Yucca Mountain (<http://www.yuccamountain.org/image/yucca03.jpg>)

Conclusion

The present Yucca Mountain nuclear waste proposal is a fundamentally flawed plan. The revised standards will only make a bad situation worse. The 2005 EPA proposed rule for Yucca drastically relaxes current regulatory standards for radiation protection and would have consequences far beyond the Yucca Mountain Repository. It would also set a dangerous precedent for relaxation of all radiation protection standards at DOE sites everywhere. (5) Furthermore, if accepted, EPA's proposed standards would be, by far, the worst standards among those of all developed nations.

PSR asserts that the newly proposed EPA radiation standards are extremely dangerous, unethical and illegal.

*-Dr. Michael McCally
Senate Staff Briefing on
Yucca Mountain,
February 27, 2006*

Based on these concerns:

- The proposed EPA radiation protection standards for Yucca Mountain will create damage to public health and the environment. Moreover, the proposed rules appear to be unscientific, unethical and illegal.
- EPA's proposed rules should be revised to keep radiation exposure limits to less than 15-25 millirem/yr for as long as the stored nuclear waste remains toxic to human health. In addition, EPA should enforce a separate groundwater protection standard of less than 4 millirem/yr for the period beyond 10,000 years.

In managing the risks of storing the deadliest nuclear waste, the Environmental Protection Agency should embrace its original mission — to provide the strictest possible health protections for current and future generations.

Please visit our webpage: www.psr.org

References

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- [2] Environmental Protection Agency, *Public Health and Environmental Radiation Protection Standards for Yucca Mountain, Nevada*, 40 CFR Part 197, (2005), U.S. Government Printing Office, Washington, D.C.
- [3] Kristin Shrader-Frechette, "Mortgaging the Future: Dumping Ethics with Nuclear Waste," *Science and Engineering Ethics* 2005; 11:1-3; also see United Nations Scientific Committee on Effects of Atomic Radiation, *Sources, Effects, and Risks of Ionizing Radiation* (1994) U.N., New York.
- [4] U.S. National Research Council, *Health Effects from Exposure to Low Levels of Ionizing Radiation* (2005) National Academy Press, Washington, D.C.
- [5] State of Nevada, Letter from Attorney General Brian Sandoval to The Attorney Generals of Ten States; Re: EPA's Proposed Radiation Rule, w/ A Primer on EPA's Proposed Radiation Standard, (August 31, 2005), <http://www.state.nv.us/nucwaste/news2005/pdf/nvag050830ag.pdf>.

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In response to the September 11 terrorist attacks on the United States, PSR has initiated the PSR Center for Global Security and Health. Drawing on the interdisciplinary experience and expertise of the PSR professional staff and Board of Directors in medicine, public health, and public policy issues including national and global security, international institutions, treaties and law, nuclear weapons doctrine, environmental health and security, violence prevention and civil conflict, the Center will provide timely information, analysis, and policy proposals to the public, policy makers, the media, and the medical community.

Through its educational efforts and policy proposals, the Center seeks to develop long-range policies for the United States that reduce the threat of terrorism and war, increase international cooperation and respect for international law, and build a healthy, just, secure and sustainable future for our citizens and others around the world. The PSR Center for Global Security and Health has published a report *New Nuclear Weapons and the War on Terrorism: Counterproliferation, Nuclear Doctrine and the Chemical and Biological Weapons Threat*, that examines these issues in greater depth.

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