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Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

ATTN: Rulemakings and Adjudications Staff.

Re: Docket ID NRC-2015-0057 Linear No-Threshold Model and Standards for Protection Against Radiation

Having 32 active years as an experimental nuclear physicist, working at accelerator facilities, low-level radiation detection, and in underground laboratories, and now involved in sustainability issues, I feel an obligation to comment on this proposed rule.

I certainly favor rejection of the LNT theory and ALARA in favor of hormesis or at least a "threshold" of 50 mSv/year for radiation workers and at least 10 mSv/year for the general public. I would also allow radiation workers to exceed 50 mSv/year (up to a maximum of 100 mSv/year) for extra pay. I also recommend an end to scare tactics on diagnostic imaging, as radiation risks from such procedures are nil compared to benefits. While I believe the science is with hormesis, I feel a threshold rule is more palpable to the public at this time.

To illustrate the craziness of LNT, around 2000, I characterized accelerator concrete shielding blocks for disposal. Because of LNT, any concrete containing DOE-added radioactivity (due to activation) needed to be disposed of as radioactive material. Our sensitivity was such that we could detect amounts of DOE-added Co-60 or Eu-152 at much lower levels than the naturally-occurring background isotopes of U, Th, and K. Thus, blocks with activity lower than natural ended up being sent from California to Nevada by truck. I had the nightmare vision of one of these trucks crossing the yellow line and killing a mom and her van-full of soccer players. I wrote my boss that continuing this job was unethical for a professional nuclear physicist and never worked on it again.

We also analyzed "legacy waste," typically minuscule research samples known to be radioactive, but unknown in terms of isotope and chemistry. We expended great effort to characterize these when they should have simply been placed in glass containers and buried deep underground, e.g., at WIPP.

Similarly, arguments against the Yucca Mountain Repository verge on the ridiculous. As I understand it, there is concern that the million year isotope I-129 will escape confinement, pass through thousands of feet of potentially binding chemistry, and several atoms will appear in the buffet dinner in Las Vegas in the year 1,000,2015. This stretches even my imagination! Currently, we put more U, Th, and K into people's lungs via fly ash than can ever escape Yucca Mt.

The LNT theory is based on erroneous premises: The view that radiation damage is not reversible is clearly wrong now that we understand about repair mechanisms in cells that routinely handle millions of DNA errors per day, and as long as radiation-caused DNA breaks are few enough to be repaired, radiation damage is not cumulative. Even assuming small real risks of radiation-induced cancers, say one-in-a-million, there is no statistical certainty that for each million persons exposed, one cancer will

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result. A million persons taking one aspirin each is not the same as one person taking one million aspirins. In addition, dose-rate is significant, as small chronic doses are different from acute doses (because of repair), making the Japanese Atomic Bomb Survivor's data less significant as a scientific basis than radiation-worker data and Beagle dog data.

The social cost of this false theory has been enormous and will be even greater if it is not replaced with something that makes sense soon. This badly-misplaced fear has stifled the development of nuclear power plants and led to the reliance on coal as a source for electricity. The U, Th, and K radioactivity in fly-ash is a more significant hazard than normal effluents from nuclear plants, and even more significant than the release from Fukushima. Renewable electricity, particularly from solar panels, is a distraction from long-term sustainability as these panels are mainly built in China by burning coal, and return little energy over their energy-cost of manufacturing. Solar energy is possibly more harmful to climate change than burning coal alone because the carbon-expense for solar energy is all up-front whereas the benefit only accrues over 25 years. At least in their present incarnation, renewable sources are at best a distraction from finding real solutions to provide electricity to sustain a population of 9 Billion by the middle of the century.

Looking into the future, with conventional oil reserves running out, transportation (particularly large trucks, agricultural equipment, and construction equipment) will need some replacement for oil products, and the best hope of providing replacement in time (15 years) would be synthetic carbon-neutral liquid fuels made by Fischer-Tropsch (or other) chemistry utilizing the heat from a nuclear reactor and feed-stocks of water and carbon-dioxide. Since the feed-stocks are the same as the combustion products, these fuels are carbon-neutral.

In summary, I strongly support changes to radiation protection rules to base safety practices on scientific evidence other than the atomic bomb survivors data and accept a threshold of 10mSv/year (or higher) for the general public and 50mSv/year (or higher) for radiation workers and eliminate the concept of ALARA, except when doses are expected to surpass thresholds. I also support reviews of radiation exposure data to look for both thresholds and hormesis effects, and to use this review to formulate future rules. I do not support more research on these issues as there is presently enough data provided it is properly and honestly interpreted.

Sincerely,

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