

From: Dr. Linda Marie Richards

Date: February 19, 2023

Subject: Testimony in opposition to HB 2215, SB 676, SB 831, and SB 832

I urge you to vote no on HB 2215, SB 676, SB 831 and SB 832. In June of 2019 the Oregon Legislature passed Senate Joint Memorial 5 (SJM 5). SJM 5 aligns Oregon with the aspirations of the UN Treaty on the Prohibition on Nuclear Weapons. SJM 5 states that every Oregonian has the “human right to live free from nuclear contamination.” The text also calls out the racial injustice and harm to human health caused by uranium mining on indigenous lands and by the Hanford Nuclear Reservation's contamination of the Pacific Northwest and the Columbia River.

Why and how it became legal to contaminate people and the environment with long lived radiation is the historical question I grapple with. I have a BS in Science (1991, Southern Oregon University) and a Doctorate in the History of Science from Oregon State University (2014). Some of my work is available at atomiclinda.com. I have studied radiation history in the published literature as well as in 27 archives, including the National Institute of Health's National Library of Medicine in Bethesda, the US National Archives, the UN, WHO, and the IAEA. I have also heard oral histories and co-edited two collections that show how damaging radiation exposure has been for just some individuals and communities. These include “Connecting to the Living History of Radiation Exposure” in the peer reviewed *Journal of the History of Biology* and a forthcoming edited volume. I also work with an international research team to decode how radiation regulations were standardized and put into place worldwide by UN agencies.

As a historian, I learned one reason why above ground nuclear weapons testing ceased with the first partial test ban in 1963 was because even pro-nuclear weapons testing scientists feared we had already passed their estimated “allowable” threshold of radiation contamination by the late 1950s. In the end, nuclear weapons states have “tested” the equivalent in kt of around 35,000 Hiroshimas underwater, underground, above ground, in the atmosphere and in space, disproportionately exposing indigenous and minority communities worldwide located near mining, production, testing and storage sites.

This pollution risks large scale harms, such as cancers, illnesses, spontaneous abortions, genetic changes and birth defects in the present and future populations. Radiation exposure also reduces immunity and creates comorbidities that may make exposed populations even more susceptible to COVID 19 and other future pandemics. This cries for redress. But instead of seeking repair, uranium mining companies, the nuclear industry and the US government continue to threaten communities, such as the Navajo Nation, where much of the uranium was mined in the past, with initiatives for new nuclear weapons and new nuclear power designs, such as this current effort by HB 2215 to overturn the 1980 moratorium that puts the safety of Oregonians first, before profits of large nuclear conglomerates.

I have many concerns about the dangers of nuclear power plants of any type as a historian of radiation health safety and human rights. My most recent paper, “1945- 1964 WHO's Right to Health?” was published in the peer reviewed European Journal *NTM*. It shows some of how radiation harm was underestimated by the US Atomic Energy Agency (US AEC). Radiation health safety standards were produced in a nontransparent process by scientists and regulators using top secret data. Their research questions, data and findings were used to justify continued nuclear weapons testing and driven by their

aspiration for nuclear technology to spread and succeed worldwide. These US AEC views of radiation contamination as an allowable, legal risk were then reproduced in the UN structure and globally.

Every nuclear power plant, no matter the size, during regular operations emits a “legal” amount of radiation into the atmosphere, environment and waterways. This is in addition to the still unsolved problem of pollution from, and remediation of, uranium mining sites. These irresolvable pollution challenges presented by nuclear power are compounded by the complex intergenerational problems caused by increasing the stream of long lived potent nuclear waste requiring isolation and storage. In fact, a new study by Stanford and University of British Columbia found that small modular reactors or SMRs will not solve this problem but exacerbate it.

An article about the study explains, “...most small modular reactor designs will actually increase the volume of nuclear waste in need of management and disposal, by factors of 2 to 30 for the reactors in our case study,” said study lead author Lindsay Krall, a former MacArthur Postdoctoral Fellow at Stanford University’s Center for International Security and Cooperation (CISAC). “These findings stand in sharp contrast to the cost and waste reduction benefits that advocates have claimed for advanced nuclear technologies.” “ (Shwartz, 2022).

Some of intergenerational tragedy of uranium mining is well known by now, available in documented, peer reviewed journals and academic published literature and books. Less well known, is how human-made radiation harm manifests. Navajo elder and scientist Perry H. Charley explains in his work, along with physical disease and harm, there are spiritual, mental and emotional wounds caused by radiological contamination. Radiation health safety standards and regulations currently do not take into account all the emotional, mental, spiritual and cultural harms caused by contamination nor the environmental justice aspects including the disproportionate or cumulative effects on subsistence cultures, indigenous peoples, women and children (Markstrom and Charley 2006; Folkers 2021; Mitchell 2021; Hamblin & Richards 2015, 2021; Richards 2013, 2014; Shrader-Frechette 2013, 2017; Pritikin 2020).

Another ongoing question I have is how it could be that the existing standards still do not factor in that women and girls are more susceptible to radiation harm than the “average male” which is the model for current radiation safety standards in the US. Women and girls, especially in subsistence communities are much more at risk than males. How can this be fair, or even good science? Another dramatically neglected topic is reproductive justice. Who studies the amount of spontaneous abortions or sterility that may be caused by exposure to radiation pollution?

All people deserve a healthy uncontaminated community. Nuclear power plants and uranium mining irrevocably contaminate our environment. Radiation can never be fully “remediated.” The future is counting on us to make the best decisions possible for our planetary health and survivability.

Thank you for your dedication to serving the future of Oregon.

Additional Readings

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Shrader-Frechette, Kristen 2017. How Some Scientists and Engineers Contribute to Environmental Injustice. *US National Academy of Engineering. The Bridge* (47/1): 36– 44.

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<https://news.stanford.edu/2022/05/30/small-modular-reactors-produce-high-levels-nuclear-waste/>