Testimony Re Senate Bill 990 - Oregon May 24 2017

Thank you Chair Helm and members of the committee.

I'm Dr John Pearson, a retired physician living in Portland and a member of the BOD of Oregon Physicians for Social Responsibility. I'd like to say a few words about the health risks from the spent fuel from nuclear reactors.

Spent fuel is very hot both radiologically and thermally and must first be cooled for a number of years before it can be handled for any kind of long term storage. Almost 90% of all the spent fuel **ever produced** still resides in cooling pools close to its parent reactor. Besides the uranium this spent fuel contains hundreds of radioactive isotopes, most of which are either short lived or insignificant in quantity. The most abundant are are Cesium 137, Iodine 131, and Strontium 90.

Cesium 137 behaves similar to sodium, the main ingredient in table salt. It forms a salt and is rapidly absorbed into all soft tissues. It has a half life of 30 yrs.
Strontium 90 behaves similar to calcium and is mistaken for calcium by the body and about 90% of it is deposited in bone marrow, some is also found in the deciduous teeth of young children. It has a half life of 20 yrs.
Iodine 131 with a relatively brief half life of 8 days is absorbed and concentrated in the thyroid as if it were simple iodine. High doses kill the thyroid and lower doses lead to the gland malfunctioning and can lead to thyroid cancer.

Once in the body these isotopes do their damage by emitting electromagnetic waves with sufficient energy to ionize, meaning they break apart, molecules in their path. We divide the spectrum of electromagnetic waves into alpha, beta and gamma waves. While they differ in level of energy they all share this ionizing ability. The disrupted, or ionized, molecules may fail to function, (say an enzyme will not be effective,) malfunction, or its cell may die. So, Strontium 90 in bone marrow may lead to the formation of leukemic cells and/or brittle bones. On occasion a cell may be repaired.

If these disruptions occur in genetically important cells subsequent generations may not be viable, or be malformed, or malfunction (have disease). Rapidly developing or growing tissue is more vulnerable than stable tissue. Thus the young are more vulnerable to these actions, the fetus being the most vulnerable.

Damage to spent fuel containers may lead to a massive release of these radioactive isotopes. Furthermore water seeping thru a cracked or damaged container will react violently with Cesium releasing free hydrogen which, when ignited, results in a significant explosion putting the nearby reactor at risk of damage and also increases the release of more radioactive isotopes from the spent fuel.

There will be a continuous production of spent fuel so long as we have nuclear reactors and the risks from spent persists regardless of the design or safety of the parent reactor.

Since we have no defense to ionizing radiation it seems the very least we can do is to limit the risk by not producing more of it.

Therefore I urge you to say “No” to Senate Bill 990.

thank you

John Pearson M.D.
BOD, Physicians for Social Responsibility