

Environmental Defense Institute

News on Environmental Health and Safety Issues

March 2014

Volume 25 Number 3

“Stuck in Second” – Low Internal Dose Cancer Risk

By Tami Thatcher

Natural and manmade radiation exposures can be from external or internal radiation. Internal radiation comes from breathing or ingesting radioactive material. Our bodies have evolved the ability to cope with normal natural background levels of radiation. The problem is that weapons test fallout and nuclear accidents like Chernobyl and Fukushima have spread manmade radioactive materials into the environment and our food. And the more radiation, the more difficult it is for our bodies to repair the biological damage.

The nuclear industry uses the International Commission on Radiological Protection dose conversion and cancer risk factors to assess the excess risk of cancer from radiation.¹ The ICRP risk model estimates of the effect of low internal doses are largely based on extrapolation of the effect of high external radiation doses.

The widely used ICRP model in the nuclear industry is a matter of life and death. And it is difficult to prove that the death was caused by radiological contamination.

Until the early 90s, the cancer epidemic caused by weapons fallout prior to the 1963 Test Ban Treaty was studied by the agency responsible for the fallout, now called the “Department of Energy” as it fought legal battles against cancer victims in nearby Utah. The plaintiffs won the case but lost on appeal.

“Sovereign immunity” allowed the government to shower its people with cancer-causing fallout while assuring them that there was no danger. Years after the fallout and many tragic early cancer deaths, Congress passed the Radiation Exposure Compensation Act of 1990.²

With each epidemiology study that finds increased numbers of cancers, the typical response is “based on the ICRP risk model, the high increase in cancers cannot be due to such low levels of radiation.”

¹ International Commission on Radiological Protection, “Compendium of Dose Coefficients Based on ICRP Publication 60,” ICRP Publication 119, Volume 41 Supplement 1 2012.

<http://www.icrp.org/docs/P%20119%20JAICRP%2041%28s%29%20Compendium%20of%20Dose%20Coefficients%20based%20on%20ICRP%20Publication%2060.pdf>

² Fradkin, P. L., *Fallout – An American Nuclear Tragedy*, Johnson Books, Boulder, Colorado, 2004.

This is now being said about the increased thyroid cancers in the Fukushima Prefecture.³

The problem, according to independent researchers, is that the ICRP risk model underestimates the cancer risk from certain low dose internal emitters like Tritium, Strontium-90, and Uranium sometimes by a factor 100 or more.⁴

The ICRP risk model underestimates the biological effects of Strontium-90 because it does not recognize the high affinity for DNA or its knock-out punch delivered by the subsequent decay of Yttrium-90 while the same cell is in the repair stage.⁵ Damaged DNA elevates the cancer risk and the risk of passing genetic defects to offspring. Natural radioactive Potassium-40 in bananas does far less damage to cells and has never been found to be carcinogenic like Strontium-90.

Along with airborne releases, Fukushima's three melted cores are leaching undetermined amounts of Strontium-90 and other radionuclides into the Pacific ocean.^{6 7} And the impact will be higher than the nuclear industry is going to telling you.

"Truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident." – A. Schopenhauer (1788-1860)

Regarding the need to update the ICRP *internal* radiation risk models – and we seem to be stuck in the second stage.

This article appeared in the Idaho Falls Post Register 3/12/14. Thatcher is a former nuclear safety analyst at INL and a nuclear safety consultant.

³ "Cancer cases rise in Fukushima but experts unsure on the cause," *Japan Daily Press*, December 23, 2013. <http://japandailynews.com/cancer-cases-rise-in-fukushima-but-experts-unsure-on-the-cause-2341371/>

⁴ Chris Busby, Rosalie Bertell, Inge Schmitz-Feuerhake, Molly Scott Cato, Alexey Yablokov, "ECRR 2010 Recommendations of the European Committee on Radiation Risk – The Health Effects of Exposure to Low Doses of Ionizing Radiation," Regulators' Edition, Green Audit, August 2010. <http://www.euradcom.org/2011/ecrr2010.pdf>

⁵ Busby, C., "Aspects of DNA Damage from Internal Radionuclides," *InTech*, 2013. <http://www.intechopen.com/download/get/type/pdfs/id/44596>

⁶ Buesseler, K.O. 2014. "Fukushima and ocean radioactivity." *Oceanography* 27(1):92–105. <http://dx.doi.org/10.5670/oceanog.2014.02>. or http://www.tos.org/oceanography/archive/27-1_buesseler.pdf

⁷ Casacuberta, N., et al, "Sr-90 and Sr-89 in seawater off Japan as a consequence of the Fukushima Dai-ichi nuclear accident," *Biogeosciences*, 2013. <http://www.biogeosciences-discuss.net/10/2039/2013/bgdc-10-2039-2013.pdf>

Whistleblower Fired After Voicing Safety Concerns at Nuclear Site

Donna Busche, who repeatedly cited dangerous conditions, is not first forced from job at leak-prone nuclear waste dump

Sarah Lazare reports 2/19/14 in *Common Dreams*: “The person responsible for overseeing the cleanup of the former nuclear weapons site in Hanford, Washington—the [most contaminated](#) in the United States—was fired on Tuesday after blowing the whistle on the dangerous conditions at the facility.

Donna Busche—manager of Environmental and Nuclear Safety for the San Francisco-based URS Corporation, a Hanford cleanup subcontractor hired by the federal government — is at least the third senior official who has been fired or forced out after raising the alarm about lack of safety at the site, [according to](#) the *Los Angeles Times*. She said executives told her she was being fired for “unprofessional conduct.”

“The Energy Department’s overall safety culture is broken and all they are doing now is sitting idly by,” Busche [declared](#) on Tuesday.

While URS [claims](#) Busche was not punished or retaliated against, Busche says she was “absolutely” targeted.

Busche, who had repeatedly charged that the clean-up company was steamrolling safety protections and ignoring dangerous technology flaws, had previously filed a lawsuit and a U.S. Labor Department complaint charging that URS was attempting to repress and fire her for speaking out.

“When people stand up and say something is unsafe and, as a result of that, they get fired, it sends a message to everyone else that to protect your career you should say nothing,” said Tom Carpenter, Executive Director for the watchdog organization Hanford Challenge, in an interview with *Common Dreams*.

He added, “I feel extremely disappointment that the federal government, who hires these contractors, has failed to hold this company to account.”

The Hanford facility, which was built by the federal government during the 1940s, has long been central to the U.S. military’s nuclear arsenal, including the development of the atom bomb, production of plutonium for the bomb dropped on Nagasaki, and other nuclear weapons.

The massive facility, which is now mostly decommissioned, is home to [more than 53 million gallons](#) of extremely radioactive sludge held in troubled tanks that have previously leaked. An estimated 1 million gallons of radioactive fluid has already spilled at the site, threatening the nearby Columbia River.

The Energy Department is engaged in a multi-billion dollar effort to transform this radioactive waste into a glass-like substance for permanent underground storage. Yet several high-ranking scientists and officials at the site have warned the technology is unsound and the process reckless.

Although they were also fired, the previous warnings by whistleblowers prompted work stoppages and a federal investigation into dangers at the site—including the [possibility](#) of a hydrogen explosion.”

“Tom Carpenter, Executive Director of Hanford Challenge, testified along with Hanford whistleblowers Donna Busche and Dr. Walter Tamosaitis in a Roundtable discussion with Senators McCaskill, Ron Johnson (R-WI) and Ron Wyden (D-OR). Carpenter stated, “The pattern of reprisal at Hanford is historical, well-documented, and has gotten progressively worse. It is not just about individual employees who get wrongfully terminated. It is about a broken nuclear safety culture that, if unaddressed, risks silencing employees who might otherwise reveal a nuclear safety defect that could lead to loss of life, contamination of the environment, or lead to a nuclear catastrophe.”

Senator Ed Markey (D-MA) submitted testimony that stated, “The safety issues that Dr. Tamosaitis and Ms. Busche raised have all been independently validated by GAO, the Defense Nuclear Facilities Safety Board, DOE’s Inspector General and DOE itself ... If the Department takes no action to halt these retaliatory actions, hold those responsible for them accountable, and limit the reimbursement of contractors’ legal fees in these cases, its efforts to improve safety culture at WTP and throughout the DOE complex will, quite simply lack all credibility.”

The Senators expressed interest in taking measures to address the reimbursement of contractor attorney fees to fight whistleblower cases, and to consider external oversight of the DOE when it comes to nuclear safety.”

For more information see: <http://www.hanfordchallenge.org/wp-content/uploads/2014/03/2014-03.11-Press-Release-Senate-Hearing-on-Retaliation.pdf>

Remember That Nuclear Dump Site That 'Was Never Supposed to Leak'?

Nation's only underground nuclear waste storage site, located in New Mexico, believed to be leaking radiation into air

Sarah Lazare reports in *Common Dreams* 2/25/14: “Waste Isolation Pilot Plant pictured December 2004 (Photo: Wikimedia / Creative Commons)A leak at the only underground nuclear waste dump in the United States is now believed to be releasing radiation into the air, the US Department of Energy (DOE) [announced](#) Monday, sparking alarm among residents near the southeastern New Mexico site.

"There's been radioactivity from nuclear waste released on the surface into the environment," said Don Hancock, Director of the Nuclear Waste Program at the [Southwest Research and Information Center](#), in an interview with *Common Dreams*. "This was never supposed to happen. That's a very serious thing. We don't know yet what caused this release, or how much has been released."

Samples taken near the federally-run Waste Isolation Pilot Plant (WIPP), 25 miles east of the town of Carlsbad, showed "slightly elevated levels of airborne radioactive concentrations, which are consistent with the waste disposed," [according to](#) the DOE.

"There is an awful lot more that should be known before we can assess the risk. The DOE has a long history of playing keep-away with the facts and promoting nuclear power."
—Arnie Gunderson, nuclear expert

WIPP holds plutonium-contaminated military waste, generated by nuclear weapons production across the United States, including Los Alamos National Laboratory in northern New Mexico. The waste is stored deep beneath the earth's surface in salt formations.

New Mexico Environment Secretary Ryan Flynn [stated](#) last week, “Events like this simply should never occur. From the state’s perspective, one event is far too many.”

Residents have [long complained](#) that WIPP, as well as nuclear waste transport across the state, puts local communities at risk, including the Native American reservations, school districts, and highways the waste passes through en route to the repository. Tewa Women United, an indigenous organization based in northern New Mexico, [slams](#) the "negative impacts that pollution and nuclear contamination have on our bodies, minds, spirits, lands, air and water" in a statement on their website.

The revelation of airborne radiation comes one week after the DOE [announced](#) detection of what they said was likely was an underground radiation leak at the facility — a leak that was [later confirmed](#). Radioactive shipments to WIPP have been halted since February 5th when a vehicle caught on fire underground, forcing the evacuation of the facility.

In their statement released Monday, the DOE sought to downplay the danger from airborne radiation, claiming that the "concentrations remain well below a level of public or environmental hazard" with a "potential dose of less than one millirem." They compared this to the typical chest x-ray, in which the patient is exposed to approximately 10 millirems.

Yet, Arnie Gundersen, former nuclear industry executive turned whistleblower, told *Common Dreams* that this comparison doesn't work. "The difference is that the x-ray is broadly distributed externally over a large piece of mass. On the other hand, the radioactivity in the air is in a particular form that can deposit in your lung. Radioactive material is attracted to your lung tissue. What you breathe in does not come out. This comparison does not take into account the internal exposure these people receive."

"Very serious... unfortunate, but it is what it is." —DOE Field Office Manager

[Approximately 300](#) concerned Carlsbad residents crowded into a public meeting Monday night to demand answers from WIPP officials.

"I'm just a mom," [said](#) Anna Hovrud, according to the *Associated Press*. "[A]nd my first reaction was to start praying. [...] Is there a chance we could be exposed to radiation, that we are being poisoned somehow, while we are waiting for these samples?"

The situation is "very serious" and "unfortunate," acknowledged Department of Energy Carlsbad Field Office Manager Joe Franco at the meeting, [according to](#) the *Carlsbad Current-Argus*. "But it is what it is," he added.

Yet, some attendees expressed doubt about the DOE's transparency. "I feel like they are not telling us everything," [said](#) area resident Leah Hunt, according to the *AP*.

Gundersen concurs. "The DOE is giving us one tenth of a percent of the information they really know," he said. "In fact there is an awful lot more that should be known before we can assess the risk. The DOE has a long history of playing keep-away with the facts and promoting nuclear power."

The DOE did not immediately respond to a request for an interview."