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June 28, 2015

Ms. Annette Vietti-Cook
Secretary of the Commission
U.S.N.R.C.
Washington, D.C. 20555

Re: Docket ID: NRC-2009-0279

Dear Ms. Vietti-Cook:

The proposal to bring the NRC into greater conformity with the standards of the ICRP is a welcome development and indeed long overdue. Unfortunately, in recent decades the NRC has fallen out of synch with international standards. While the rest of the world tightened its regulations in light of information on radiation effects gleaned from Chernobyl, the NRC, though well aware of that data, was moving in the opposite direction, loosening its standards and producing what is now a wide gap between American and world norms.

A key step in this process occurred in the 1990's, when the NRC, acting on a petition for rulemaking from Dr. Carol S. Marcus, enacted a sweeping deregulation of nuclear medicine, with the result that for patients released with large quantities of I-131 in their systems, the U.S. now has laxer radiation protection standards than those of Europe, Japan, Indonesia, Iran, etc.

To those with mainstream views of radiation, as well as to anyone who cares about the credibility of the NRC, the idea of the United States as an outlier in the world radiation protection community should be deeply troubling. Dr. Marcus, on the other hand, in her comments on this ANPR, proudly embraces the term "outlier," and urges the NRC to become more of one, not less. She also points out that the NRC has three recent rulemaking petitions pending before it that would abolish the principle of ALARA (as low as reasonably achievable) and instead endorse "hormesis," the notion that radiation in low doses, far from being presumptively harmful, is a positive benefit to health. She argues that the existence of these petitions is a basis for the NRC not to proceed down the path outlined in the ANPR.

I disagree. First of all, Dr. Marcus fails to mention that she herself filed one of the three petitions, and that the others closely resemble hers. Since the NRC has issued a notice of the receipt of the three petitions, with an opportunity for public comment, at 80 FR 35870 (June 23, 2015), I will reserve my detailed comments on them for that docket.

There are many who take issue with the Linear No-Dose Threshold (LNT) theory, but to go further, and make the leap to a belief in hormesis, is quite a different matter. It is noteworthy that in its comments on the ANPR, the Health Physics Society, which has questioned the validity of the Linear No-Dose Threshold Theory (LNT), does not disagree with the general proposition that NRC standards should be closer to those of the ICRP.

Mainstream science, as exemplified by the National Academies of Science in BEIR VII, regards hormesis as fallacious. BEIR VII explicitly considered the writings of two prominent hormesis advocates, Dr. Myron Pollycove and Dr. Ludwig Feinendegen (the latter a signatory

to the third petition), and rejected them, explaining the flaws in their reasoning.¹ The hormesis advocates argue, however, that the notion that radiation should be presumed harmful is a scientific fraud, first sold to a gullible world by a Nobel Prize winner's acceptance speech in 1946, then covered up by a distinguished geneticist of that era, and perpetuated ever since by regulatory agencies and scientific bodies afraid that if the secret that radiation is a health benefit ever gets out, they and their jobs will become redundant. To the hormesis partisans, the fact that the NAS rejects the theory proves nothing, since in their cosmos, the Academies are a principal villain, driven by self-interest. Nor is the NRC exempt from suspicion. The third petition declares that the NRC is too self-interested to be entrusted with decisions related to hormesis, and asks for the issue to be turned over to an "independent committee."² One can readily imagine the petitioners' idea of the composition of such a committee.

There is no need to belabor the point. The notion of a continuing international 68-year conspiracy to conceal scientific truth is just too far-fetched to deserve extended comment, no matter if there are thousands of papers touting it in the movement's own publications.³

Where is mainstream science on these issues today? I am indebted to Dr. Jan Beyea, now of Consulting in the Public Interest (CIPI), for alerting me to a very recent (May 2015) paper by five co-authors from the National Cancer Institute, "A New Era of Low-Dose Radiation Epidemiology."⁴ Its conclusion includes the following:

The last decade has introduced a new era of low-dose radiation epidemiology. Record linkage studies have suggested for the first time that pediatric CT scans may increase cancer risk, and that natural background radiation may contribute to childhood leukemia. Large

¹ The late Dr. Pollycove was the NRC's scientific advisor on the 1997 deregulation of radioisotope treatments and a consultant to the agency for many years. He was a kindly, gentle soul, unfailingly warm and friendly, regardless of whether you shared his views on radiation.

² They write: "Considering that the LNT model originated in the 1950s due to the self-interest motivation of members of advisory bodies (32), as mentioned in the petition by Dr. Marcus, similar motivation cannot be ruled out for its continuing support by later advisory bodies, since they have failed to respond to accumulating evidence against the LNT model and have continued to support the use of the LNT model. Regulatory agencies such as EPA and NRC also have a self-interest motivation for the continued use of the LNT model, since the model justifies the current regulations relating to low radiation doses, and the use of a threshold model would reduce and eliminate these regulations, resulting in a tremendous downsizing of the regulatory agencies and their scope. Hence, petitions which ask for the discontinuation of the use of the LNT model should not be dealt with by NRC directly, but by an independent committee set up external to the NRC, in order to avoid major conflict of interest issues."

³ Dr. Edward J. Calabrese, whose CV includes a list of publications some 115 pages long, is the author of such articles as "How the US National Academy of Sciences misled the world community on cancer risk assessment: new findings challenge historical foundations of the linear dose response." Arch Toxicol. 2013 Dec;87(12):2063-81. See also his article: "Muller's Nobel Prize Lecture: when ideology prevailed over science," Toxicol Sci. 2012 Mar;126(1):1-4 .

⁴ Cari M. Kitahara, Martha S. Linet, Preetha Rajaraman, Estelle Ntowe, and Amy Berrington de González, Curr Envir Health Rpt, DOI 10.1007/s40572-015-0055-y.

pooling projects of occupational cohorts have provided additional insights into the risks from protracted radiation exposure, and also raised questions about the risk of other stochastic effects after low-dose exposures including cardiovascular disease and cataracts. There are potential sources of bias in all of these populations, but the case for causality is strengthened by the evidence of a dose–response and consistency with the existing evidence at higher doses. In the next decade, integrated characterization of both germline and somatic alterations (including inherited mutations, somatic, and epigenetic changes) in populations with well-characterized exposure to ionizing radiation could propel our understanding further regarding thresholds, radiosensitivity of population subgroups and individuals, and the mechanisms of radiation carcinogenesis.

In short, the filing of the three petitions is no reason for the NRC to delay the process of bringing the U.S. into greater conformity with current scientific knowledge and international norms. This agency should become less of an outlier, not an even more extreme one, as urged by Dr. Marcus.⁵ Only in that way can the NRC begin to reclaim its rightful position of leadership in the world radiation protection community.

Respectfully submitted,

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⁵Why Dr. Marcus should even care what the NRC says is hard to understand, given her oft-repeated opinion of its credibility, e.g.: “The Commission, with its oversimplifications of medical and pharmacy practice, required willing pawns to do its work. A sort of Darwinian evolution took place in which the scientifically unfit, a few individuals with very poor attitudes, and several cowards inherited the duty.... In order to support the Commission's desires, and advance their own power agendas, the present staff uses fraud in any convenient form. Data are misrepresented, omitted, ignored, or manufactured for convenience. ... The recent humiliation of NRC by staff of OMB when NRC's fraudulent version of the ‘Quality Management Rule’ was uncovered is astounding but predictable. Instead of NRC's upper management retracting the material and apologizing, a delegation of NRC staff and management went into frenzied, paroxysmal ‘superlying’ to cover the original lying, and earned the contempt of all concerned. Some of the statements made in writing by NRC staff to justify the Rule describes actual deaths of patients caused by physicians which in fact did not occur. This would itself constitute a libel suit, but in this case has no point; **no damage will be done because no one believes the NRC anyway.** Pitiful, isn't it?” (Letter to NRC Secretary Samuel J. Chilk, January 24, 1992.) [Emphasis added.]