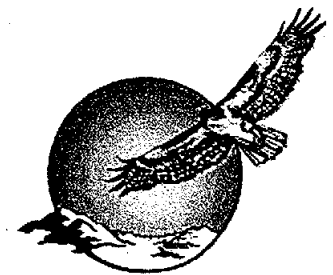


# Tri-Valley CAREs

## Communities Against a Radioactive Environment

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*Peace Justice Environment  
since 1983*

October 31, 2001

NIOSH Docket Office,  
Robert A. Taft Laboratories; M/S C34  
4676 Columbia Parkway  
Cincinnati, OH 45226

11-06-01P01:02

National Institute of Occupational Safety and Health

Re: Tri-Valley CAREs comments on EEOICPA dose reconstruction

Tri-Valley CAREs (Communities Against a Radioactive Environment) was started in 1983 by a group of neighbors and laboratory workers of the Lawrence Livermore National Laboratory. We wish to submit the following information as part of the Department of Labor's (DOL) formal comment period regarding how dose reconstructions will be done.

We strongly advocate for the integration of stakeholder and worker input throughout all stages of dose reconstruction because conditions in and between facilities can vary so significantly, as can the interaction of radiation with the worker's body. Worker and stakeholder input can help to customize what is measured and how it is measured to ensure a higher level of dose reconstruction accuracy as opposed to standardized measurements based on inadequate data. For instance, worker input could describe how their exposure was due to carrying "hot" materials on their left side, yet their dose badges were always pinned to their right pocket and, therefore, may not have recorded the exposure.

We suggest that worker participation be coordinated through cooperation with the union(s) and by using both one-on-one interviews and open meetings. Workers should be able to provide an affidavit to NIOSH based on their knowledge and that is part of the administrative record. Where significant data gaps exist for an individual, we hope that NIOSH will group workers based on job categories, department or building information to assist in dose estimation. Air monitoring data, dose badge re-reading, neutron exposures, isotopes and ionizing radiations, radiation surveys, work practices, co-located worker exposure data should all be considered in reconstructing the dose.

Past DOE conflict of interest problems would be detrimental if they resurface in implementation of the current legislation. For that reason we recommend that individuals or companies not be placed in the position of reviewing, re-estimating or needing to critique their current or former radiation dosimetry work. If there is a potential liability associated with radiation exposure or if the individual or company has been retained by

the DOE or its contractors to serve as experts in ongoing litigation that involves radiation, these individuals or companies should not receive contracts to perform dose estimates for NIOSH.

The revised radioepidemiological tables and the supporting interactive computer program (IREP) should be modified to address weaknesses. The tables need to be tailored to better account for the experiences of workers in the nuclear weapons complex. We suggest tailoring tables to include results of epidemiological studies of workers so that the tables reflect low-dose exposures typically received over a working lifetime and internal exposure to alpha particles—the largest sources of radiation dose at many DOE sites.

There are assumptions built into the IREP model that need to be adjusted to truly reflect the atomic bomb survivor data and the conditions at DOE nuclear facilities. One assumption in the IREP model—the effectiveness of radiation at causing cancers decreases at low doses—needs to be changed. In the analyses of the atomic bomb survivor data—the quantitative basis for the tables—atomic bomb survivor data suggests that there is no reduction in effectiveness at causing solid cancers at low doses. In addition, the epidemiological tables are applied to workers who were exposed to alpha and neutron radiation typical at the DOE facilities, not just gamma radiation, which was typically the type of radiation exposure that atomic bomb survivors received. These incorrect assumptions cause the IREP model to be programmed with a dose and dose-rate effectiveness factor (DDREF) value that is distributed around 2 and which is too high for solid cancers.

National Research Council studies published in the National Academy Press in 1999 of exposure to alpha-radiation among miners suggest an inverse exposure rate effect (that is, radiation effects were of larger magnitude when doses were accrued at lower dose rates). Also, an International Agency Research on cancer study published in 2000 concluded that there is no evidence of a reduction in effectiveness of neutrons at low dose or low dose rates, and that effects may be larger for neutron doses accrued at lower rates.

A 1997 study by the National Council on Radiation Protection and Measurements suggests that the simple inflation of all doses by a fixed correction factor is an inadequate assumption about the distribution of measurement error. The study suggests that further investigation of measurement techniques for evaluating the contribution of the neutron component of dose in each city, and at varied distances, is needed to understand the error distribution.

The decision to divide the lung cancer radiation risk estimate approximately in half for all workers who ever smoked should be questioned. We recommend that NIOSH apply the multiplicative approach for all cancers. The assumption that a multiplicative relative risk model is valid has been argued in much of the literature on radiation effects.


Furthermore, the multiplicative model would give the benefit of the doubt to the claimant in a situation where there is scientific uncertainty

The assumption built into the current radioepidemiological tables is that the probability that an adult worker's cancer was caused by radiation tends to be lower for workers exposed at older ages than younger ages. Recent occupational epidemiological studies, however, indicate the opposite is true. Richardson and Hoffman report in the *Occupational Medicine: State of the Art Reviews 2001* that older adults are more vulnerable to the cancer causing effects of ionizing radiation than young adults. The work of Kaplan and Haan in the 1999 *Annual Review of Public Health* and the work of Cohen in *Cancer* published in 1994 find a similar pattern of increasing vulnerability in later life in most studies of other chemical and physical hazards.

We hope that the recommendations and suggestions above will influence how dose reconstruction will be done, the assumptions built into the radioepidemiological tables, and the IREP model. Without these revisions we believe that many sick nuclear workers will be denied compensation in direct conflict with the goals and objectives of the Energy Employees Occupational Injury Compensation Program Act.

We appreciate the opportunity to provide our comments.

Sincerely,



Marylia Kelley  
Executive Director

MK:pao