retained on various surfaces of the body. Interception and retention fractions are derived from measurements of accumulation of ash particles on the ground surface and on different parts of the body following volcanic eruptions. These fractions are adjusted to account for an enhancement in retention when hair and moisture are present on skin. Retention of particles on skin decreases with increasing particle size for particle diameters greater than 50 microns. Since skin preferentially retains small particles, the specific activity of retained material is enhanced compared with the specific activity of material incident on the body when radionuclides are distributed on the surface of particles. Skin contamination due to resuspended material increases with increasing wind speed and exposure duration. We present example calculations of skin doses obtained using uncertainty analysis techniques for specific exposure scenarios at the Nevada Test Site and Pacific Proving Ground. For exposure to descending fallout or resuspended material, electron doses to skin from dermal contamination can be a significant and sometimes dominant contributor to the total skin dose from all exposure pathways.

TPM-C.10

DEVELOPMENT OF IMPROVED METHODS OF DOSE RECONSTRUCTION FOR ATOMIC VETERANS. D.C. Kocher, A.I. Apostoaei, and J.R. Trabalka (SENES Oak Ridge, Inc., 102 Donner Drive, Oak Ridge, TN 37830)

This presentation gives an overview of work for the Defense Threat Reduction Agency (DTRA) that was undertaken in response to a review of DTRA's dose reconstruction program for atomic veterans by a National Research Council committee. The main purpose is to provide DTRA with improved methods of estimating credible upper bounds (at least upper 95% credibility limits) of radiation doses to atomic veterans for use by the Department of Veterans Affairs (VA) in adjudicating claims for compensation for cancers. We generally evaluate uncertainty in dose assessment models using probability distributions of model parameters to represent their uncertainty and Monte Carlo sampling techniques to propagate parameter uncertainties and generate probability distributions of model output. Specific areas of work include (1) an evaluation of options for reporting atomic veterans' doses to facilitate use by the VA of the Interactive RadioEpidemiological Program (IREP) to estimate upper 99% credibility limits of probability of causation (PC) of cancers; (2) development and evaluation of models to estimate contamination of skin and clothing by descending or resuspended fallout or by contact with contaminated ground or other surfaces and resulting electron doses to skin; (3) an analysis of potential effects of fractionation of radionuclides in fallout on estimates of dose from inhalation or ingestion or from external exposure to contaminated ground; (4) an analysis of uncertainty in estimates of inhalation dose in scenarios involving resuspension of previously deposited fallout by the blast wave produced by a nuclear detonation; (5) development of screening doses corresponding to a PC of 50% at the upper 99% credibility limit for all cancers considered in IREP to facilitate streamlining of dose reconstructions; and (6) development of tools to communicate information to atomic veterans on radiation risk, PC, and use of dose estimates in adjudicating claims for compensation.

TPM-C.11

TARGET ORGAN SELECTION ISSUES FOR DOSE RECONSTRUCTION UNDER THE ENERGY EMPLOYEES OCCUPATIONAL ILLNESS COMPENSATION PROGRAM ACT. B.A. Ulsh, R.W. Henshaw, T.D. Taulbee, and D.E. Allen (National Institute for Occupational Safety and Health, 1186 Emery Ridge Drive, Batavia, OH 45103)

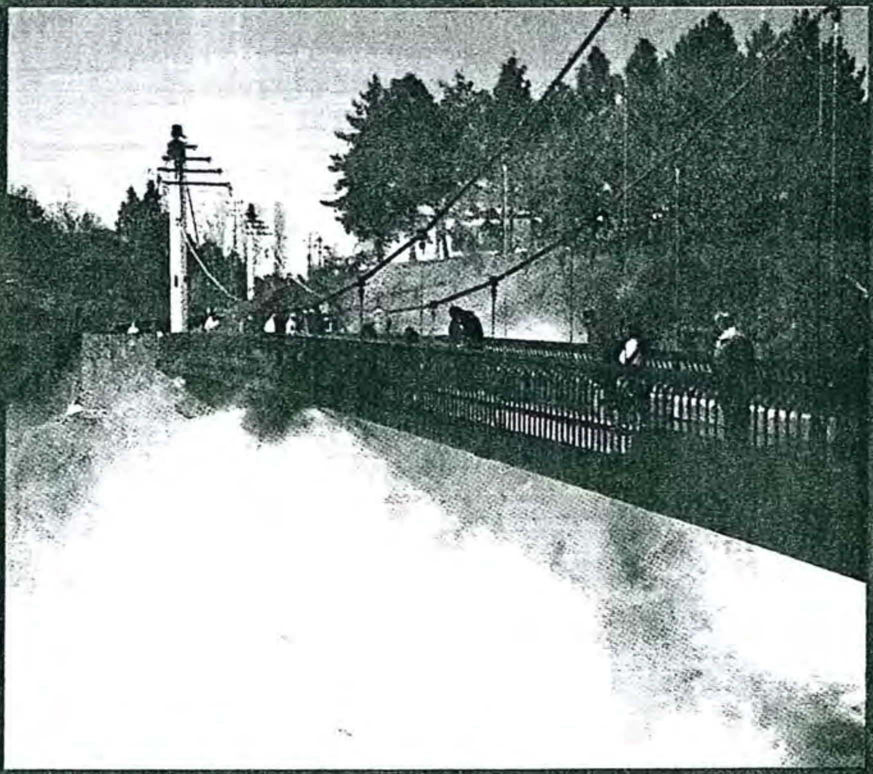
The National Institute for Occupational Safety and Health (NIOSH) has been charged with the responsibility of reconstructing doses received by U.S. nuclear weapons workers who have developed cancer and filed claims for compensation under the Energy Employees Occupational Illness Compensation Program Act of 2000 (EEOICPA). One of the first tasks facing the dose reconstructor is selection of the appropriate target for calculation of organ doses. This selection is determined largely by the cancer diagnosis and is fairly straightforward for solid tumors, with a few notable exceptions. These exceptions include issues related to the use of surrogate organs for calculation of organ doses from external sources, for example the use of the urinary bladder for the prostate gland and the use of the stomach for the liver, gall bladder, and spleen. Target organ selection is not so straightforward for some cancers involving the hematopoietic and lymphatic systems, such as lymphoma. For these cancers, NIOSH is investigating the relationship between the site of cancer occurrence and the site of the original radiation injury. Once the target organ has been selected, NIOSH uses current ICRP methodologies for converting whole-body external doses to the appropriate organ dose, and for modeling organ doses resulting from uptakes of internally deposited radionuclides. The calculation of the probability that a claimant's cancer was caused by occupational exposure to radiation is based on the relevant organ dose and type of cancer, and this calculation informs the compensation decision made by the Department of Labor.

VOL. 89, NO. 1, JULY 2005
SUPPLEMENT TO

HEALTH PHYSICS

THE RADIATION SAFETY JOURNAL

The Official Journal of
the Health Physics Society



Abstracts of Papers
Presented at the
Fiftieth Annual
Meeting of the
Health Physics Society
Spokane, Washington

LIPPINCOTT
WILLIAMS & WILKINS

www.health-physics.com