satisfactory high, and the variation was small. This method was applied to a research of background Pu level in Rokkasho, Aomori where the first commercial nuclear fuel reprocessing plant in Japan is now being constructed. The mean recovery rate for 50 soil samples is 70 ± 8 %.

TAM-C.10

SMOKING AS A CONFOUNDER IN ECOLOGIC CORRELATIONS OF CANCER MORTALITY RATES WITH AVERAGE COUNTY RADON LEVELS. J.S. Puskin (United States Environmental Protection Agency, Office of Radiation and Indoor Air, 11103 Old Coach Road, Potomac, MD 20854)

The correlation between U.S. cancer mortality rates and measured average radon concentrations by county is examined. In general, quantitatively similar, strongly negative correlations are found for cancers strongly linked to cigarette smoking, weaker negative correlations are found for cancers moderately increased by smoking, whereas no such correlation is found for cancers not linked to smoking. The results indicate that the reported negative dependence of lung cancer mortality on average radon level by county can largely be accounted for by a negative correlation between smoking and radon levels across counties. Hence, the observed ecological correlation provides no substantial evidence for a protective effect of low level radon exposure. Evidence is provided that the negative correlation between radon and cancer mortality is diminishing over time as geographic differences in smoking prevalence are reduced.

TAM-C.11

LUNG CANCER RISK IN NON-SMOKERS FROM RESIDENTIAL RADON: REVIEW OF CASE-CONTROL STUDIES. J.S. Neuberger[1] and T.F. Gesell[2] ([1]University of Kansas School of Medicine, Department of Preventive Medicine and Public Health, Mail Stop 1008, 3901 Rainbow Boulevard, Kansas City, KS 66160; [2]Idaho State University)

Case-control studies of the relationship between lung cancer and residential radon usually include a preponderance of smokers or former smokers in the cases. Since the number of non-smoking cases is often small, the major focus of the analysis is usually on smokers and non-smokers combined, with adjustment for smoking. However, since tobacco smoke is a much stronger carcinogen than radon and adjustment for smoking may not be completely adequate, residual confounding may occur. A more straightforward approach is to concentrate on non-smokers, thus avoiding the need for smoking adjustment in never smokers and allowing for a more precise adjustment for ex-smokers (e.g., including both pack-years and time since quitting). We performed a critical review of published case-control studies of residential radon exposure and lung cancer with particular focus on non-smokers, which includes studies not available for our previous review published in the Health Physics Journal. Our criteria for reviewing a study included 1) publication in a peer reviewed journal, 2) including non-smokers, and 3) analyzing at least 100 lung cancer cases. Fifteen such studies were found. Of these, several are discussed to illustrate methods, problems, and results. Twenty studies did not meet the criteria for inclusion. Problems found in the accepted studies include lack of discussion of QA/QC procedures, inferred radon exposures, less than annual radon measurements, proxy reporting of occupational and other exposure variables, and lack of independent outcome assessment. Out of the 15 studies, two found a statistically significant increase in risk for non-smokers with increasing radon exposure, and seven found non-significant increases in risk with odds-ratios generally in the range of 1.1-1.2. The meta-analysis, which found a slight, non-significant increase in risk, included study designs that were not similar, or that had some methodological problems. An additional meta-analysis and a pooling of results found no significant increase in risk. Issues with combining these data in a meta-analysis are discussed. We recommend more complete reporting of results for non-smokers in individual studies and discuss the potential need for a large, original, case-control study in non-smokers.

DOSE RECONSTRUCTION UNDER THE ENERGY EMPLOYEES OCCUPATIONAL ILLNESS COMPENSATION PROGRAM

Tuesday, 22 July 2003
Pacific 3
8:30 am–Noon

TAM-D.1

AN OVERVIEW OF THE ENERGY EMPLOYEES OCCUPATION ILLNESS COMPENSATION PROGRAM (EEOICPA). L.J. Elliott (National Institute for Occupational Safety and Health, 4676 Columbia Parkway, Cincinnati, OH)

In October 2000, the United States Congress passed the Energy Employees Occupational Illness Compensation Program Act (EEOICPA), P.L. 106-398 " 3623. On 7 December 2000, the President issued E.O. 13179 assigning roles under EEOICPA to the U.S.

Department of Health and Human Services (HHS), the U.S. Department of Labor (DOL) and the U.S. Department of Energy (DOE). The role assigned to HHS included the promulgation of two regulations central to the adjudication of cancer-related claims and to consider procedures for the evaluation of petitions for adding classes of workers to the Special Exposure Cohort. The first of these rules, 42 CFR Part 81, establishes guidelines to determine whether an individual with cancer shall be found "at least as likely as not" to have sustained that cancer from exposure to ionizing radiation in the performance of duty for nuclear weapons production programs of the U.S. Department of Energy (DOE) and its predecessor agencies. These "probability of causation" guidelines will be used for the adjudication of cancer claims by the U.S. Department of Labor (DOL), which has lead responsibility to administer this federal compensation program. The second of these rules, 42 CFR Part 82 , establishes the methods by which HHS will estimate the doses of radiation incurred by individual employees of nuclear weapons production programs. This presentation discusses 1) the approach NIOSH has taken to implement its roles and responsibilities under the EEOICPA; 2) NIOSH's interaction with the DOL and DOE; and 3) the overall status of the program.

TAM-D.2

IMPLEMENTATION OF THE DOSE RECONSTRUCTION RULE—42 CFR PART 82. J.W. Neton (National Institute for Occupational Safety and Health, 4676 Columbia Parkway, Cincinnati, OH 45226)

In May of 2002, NIOSH published 42 CFR Part 82, Methods for Conducting Dose Reconstructions Under the Energy Employees Occupational Illness Compensation Program Act (EEOICPA) of 2000. These methods are being used by the National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC) to conduct dose reconstructions for covered employees seeking compensation for cancer, other than as a member of the Special Exposure Cohort, under EEOICPA. The rule provides guidance as to how dose reconstructions are conducted to characterize the radiation environment to which workers were exposed. A hierarchy of methods is used, depending on the nature of the exposure conditions and the type, quality, and completeness of data available to characterize the environment. The methods employed are based on approaches similar to that used in traditional occupational dosimetry, but achieve efficiency by substituting scientific, reasonable, and fair assumptions in the place of extensive data collection. This allows for an increase in claims processing efficiency, which is essential for an effective compensation program, without compromising the accuracy of the final compensation decision.

TAM-D.3

THE APPLICATION OF DOSE RECONSTRUCTION RESULTS TO NIOSH-IREP (NIOSH'S VERSION OF THE INTERACTIVE RADIO-EPIDEMIOLOGICAL PROGRAM) IN ESTIMATING THE PROBABILITY OF CAUSATION OF RADIOGENIC CANCER. R.W. Henshaw and L.J. Elliott (National Institute for Occupational Safety and Health, 4676 Columbia Pkwy, Cincinnati, OH 45226)

NIOSH-IREP is an online, interactive software program created specifically for use in adjudicating cancer claims under the Energy Employees Occupational Illness Compensation Program Act (EEOICPA), as promulgated by 42 CFR, Part 81, "Guidelines for Determining Probability of Causation." To qualify for compensation, EEOICPA stipulates that an individual's cancer has to have been "at least as likely as not" caused by exposure to ionizing radiation while in the performance of covered duties. This presentation provides an overview of NIOSH-IREP and its application of reconstructed radiation doses and other variables to calculate the statistical probability, according to the provisions of EEOICPA, that a worker's cancer was induced by occupational exposure to ionizing radiation. Examples of the types of radiation exposures that are likely to be compensated are presented, as well as those not likely to result in compensation. To calculate the unique probability of causation (PC) for each claim, NIOSH-IREP incorporates probability distributions derived from uncertainties associated with cancer risk models, radiation exposure, dose-response assumptions, and personal attributes, employing Monte Carlo simulations to propagate these uncertainties. Individual dose reconstruction results are factored into the calculations via inputs for radiation type and exposure rate, organ dose in cSv, and year of exposure. In order to provide the benefit of doubt to each claimant, a claim is considered compensable if the PC result is 50% or greater at the upper 99th percentile credibility limit.

TAM-D.4

CREATION OF A DOSE RECONSTRUCTION ORGANIZATION.* R.E. Toohey (Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831)

Upon award of the NIOSH dose reconstruction project, ORAU and its partners, MJW Corp. and Dade

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On the cover: A panda at the San Diego Zoo. Photo courtesy of the San Diego Convention and Visitors Bureau.

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