

coupled with historical meteorology, to estimate, radionuclide-specific airborne concentrations for ^3H , ^{131}I , ^{41}Ar , $^{238/239/240}\text{Pu}$, and $^{234/235/238}\text{U}$. Air concentration calculations included spatial and release height considerations for source terms from two separations and five reactor areas at the Savannah River Site. The 50th and 95th percentile air concentrations were estimated for these source term areas as well as other populated areas. The utilization of residual soil activities has also been implemented in the Technical Basis Document.

*(Work supported by the National Institute for Occupational Safety and Health under contract no. 200-2002-00593.)

TPM-D.4

CONSTRUCTION OF A SECURE ONLINE ENVIRONMENT FOR DOSE RECONSTRUCTIONS.* L.V. Wierowski,¹ P.W. Wallace,² and M.D. Wierowski¹ (¹MJW Corporation Inc., 338 Harris Hill Road, Suite 208, Williamsville, NY 14221; ²Oak Ridge Associated Universities)

The performance of dose reconstructions under the Energy Employees Occupational Illness Compensation Program Act involves a team of health physics professionals working together from locations across the country. This unique workforce configuration presents numerous information management challenges, most notably, providing high-speed access to data in a variety of formats in a secure environment. A secure environment is required because all data related to a claim is protected under the Privacy Act. To facilitate efficient processing of each claim, the dose reconstruction staff needs access to the original claim documents, the telephone interview(s), all dosimetry records, and the technical basis document(s) for the relevant site(s). This information is primarily stored in electronic documents. Staff also need access to a variety of databases and to controlled versions of the software tools used for totaling internal and external exposures and determining the probability of causation, and a mechanism for collaborating on an individual claim via on-line discussion. The claims tracking staff requires a project management system to monitor each step involved in the processing of a claim. Due to the volume of claims in the program, the system must allow the project staff to indicate their individual progress. This system must be able to support concurrent users in a Web environment and provide automatic notifications as milestones are reached and/or problems identified. A combination of in-house developed applications, commercial software and Internet technologies such as virtual private networking, have been brought together to create a secure environment. This environment enables

the dose reconstructor to access all data and tools necessary to perform the dose reconstruction and communicate with other team members. The system also helps to automatically track the progress of each claim through the dose reconstruction process.

*(Work supported by the National Institute for Occupational Safety and Health under contract no. 200-2002-00593.)

RISK ANALYSIS

Tuesday, 22 July 2003

Pacific 3

4:00-5:15 pm

TPM-D.5

TOTAL RISK OF CANCER FROM INGESTION AND INHALATION OF MULTIPLE RADIONUCLIDES. A.I. Apostolaci, B.A. Thomas, and F.O. Hoffman (SENES Oak Ridge, Inc., 102 Donner Drive, Oak Ridge, TN 37830)

In cases of ingestion or inhalation of multiple radionuclides (e.g., by a member of the public exposed to releases from a nuclear facility) each organ of the body receives a different radiation dose. The risk of cancer can be calculated only for the organs for which a dose response has been determined. However, there are some remainder organs for which a cancer is potentially radiogenic but for which no individual dose response is available. To assess the overall impact of exposure to multiple radionuclides, an estimate of the total risk is desired. However, the sum of the individual organ risks underestimates the total risk, since not all organs have a predetermined dose response. This paper introduces a method by which the total risk can be estimated and presents results obtained for offsite exposure to releases of radionuclides from the Oak Ridge Reservation. The basic estimates of dose response rely on the Japanese A-bomb survivor data for solid tumors. The objective is an estimate of the excess lifetime risk of cancer incidence. The method presented here is based on the existence of a risk coefficient for all solid tumors combined, and it is similar in concept to using the effective dose for estimating the total risk. A weighting factor is determined for each organ of the body, starting from the number of cancers observed for that cancer type and the total number of cancers for all solid tumors. A weighted dose is then calculated using the weighting factors and the doses for each organ, and the total risk is determined using the weighted dose and the risk coefficients for all solid tumors. The risk of leukemia (often reported separately from risk of solid tumors) is added to the total

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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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