# Kansas Administrative Regulations

## Department of Health and Environment

### Article 35.—Radiation—Part 4. Standards for Protection Against Radiation.

**28-35-212d. Determination of internal exposure.**

(a) When assessing the dose used to determine compliance with occupational dose equivalent limits, each licensee or registrant shall, when required pursuant to K.A.R. 28-35-217b, take suitable and timely measurements of any of the following:

(1) Concentrations of radioactive materials in the air in work areas;

(2) quantities of radionuclides in the body;

(3) quantities of radionuclides excreted from the body; or

(4) any combination of the measurements specified in paragraphs (a)(1) through (3).

(b) Unless respiratory protective equipment is used, as specified in K.A.R. 28-35-212g, or the assessment of intake is based on bioassays, the licensee or registrant shall assume that an individual inhales radioactive material at the airborne concentration in which the individual is present.

(c) If specific information on the physical and biochemical properties of the radionuclides taken into the body or the behavior of the material in an individual is known, the licensee or registrant may perform the following:

(1) Use that information to calculate the committed effective dose equivalent, and if used, the licensee or registrant shall document that information in the individual's record;

(2) before approval of the secretary, adjust the DAC or ALI values to reflect the actual physical and chemical characteristics of airborne radioactive material; and

(3) separately assess the contribution of fractional intakes of class D, W, or Y compounds of a given radionuclide to the committed effective dose equivalent.

(d) If the licensee or registrant chooses to assess intakes of class Y material using the measurements given in paragraph (a)(2) or (3), the licensee or registrant may delay the recording and reporting of the assessments for up to seven months, unless

otherwise required by K.A.R. 28-35-229a or K.A.R. 28-35-230a, in order to make additional measurements basic to the assessments.

(e) If the identity and concentration of each radionuclide in a mixture are known, the fraction of the DAC applicable to the mixture for use in calculating DAC-hours shall be either of the following:

(1) The sum of the ratios of the concentration to the appropriate DAC value, from appendix B published in "appendices to part 4: standards for protection against radiation," as adopted in K.A.R. 28-35-135a, for each radionuclide in the mixture; or

(2) the ratio of the total concentration for all radionuclides in the mixture to the most restrictive DAC value for any radionuclide in the mixture.

(f) If the identity of each radionuclide in a mixture is known but the concentration of one or more of the radionuclides in the mixture is not known, the DAC for the mixture shall be the most restrictive DAC of any radionuclide in the mixture.

(g) If a mixture of radionuclides in air exists, a licensee or registrant may disregard certain radionuclides in the mixture if all of the following conditions are met:

(1) The licensee or registrant uses the total activity of the mixture in demonstrating compliance with the dose limits in K.A.R. 28-35-212b and in complying with the monitoring requirements in K.A.R. 28-35-217a (d).

(2) The concentration of any radionuclide disregarded is less than 10 percent of its DAC.

(3) The total concentration of all of the radionuclides disregarded in the mixture does not exceed 30 percent.

(h) When determining the committed effective dose equivalent, the following information may be considered.

(1) In order to calculate the committed effective dose equivalent, the licensee or registrant may assume that the inhalation of one ALI, or an exposure of 2,000 DAC-hours, results in a committed effective dose equivalent of 0.05 Sv (5 rem) for radionuclides that have their ALIs or DACs based on the committed effective dose equivalent.

(2) For an ALI and the associated DAC determined by the nonstochastic organ dose limit of 0.50 Sv (50 rem), the intake of radionuclides that would result in a committed

effective dose equivalent of 0.05 Sv (5 rem), which is the stochastic ALI, is listed in parentheses in appendix B, table I in "appendices to part 4: standards for protection against radiation," as adopted in K.A.R. 28-35-135a. The licensee or registrant may, as a simplifying assumption, use the stochastic ALI to determine the committed effective dose equivalent. However, if the licensee or registrant uses the stochastic ALI, the licensee or registrant shall also demonstrate that the limit in K.A.R. 28-35-212a(a)(1) (B) is met.

(Authorized by and implementing K.S.A. 48-1607; effective Oct. 17, 1994; amended Dec. 30, 2005.)

***** Authenticated Kansas Administrative Regulation *****