Comparison of Parameters for Modeling Tritium Dispersion

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Consequences calculated for accident analysis scenarios involving large tritium releases (greater than one million Curies) are influenced by the selection of input variables. These include, among others, dispersion coefficients, chemical form, plume buoyancy and deposition velocity. When analyzing a deposition velocity for appropriate use, several processes are involved that can be described by an aggregate plume depletion velocity. The value of the aggregate factor selected for plume depletion may have enough impact to ultimately influence controls required for the facility. This paper includes a brief discussion of the implications of input variable selection and factors that make up an aggregate depletion velocity for tritium oxide. Conversion of the initial tritium gas source term by several energetic events into tritium oxide is evaluated by comparing the dose from a tritium gas release to the dose for an equivalent tritium oxide release. Consequence values for a unit release considering different levels of plume depletion using Gaussian diffusion codes are compared. The impact of various dispersion coefficients on the final consequence values at an offsite receptor location is presented.