Deposition Velocity Estimation with the GENII2 Computer Code

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In 2010, the Department of Energy (DOE) Chief of Nuclear Safety and Office of Health, Safety and Security (HSS), with the support of industry experts in atmospheric sciences and accident dose consequences analysis, performed detailed analyses of the basis for the deposition velocity (DV) values used in the MACCS2 computer code. As a result of these analyses, DOE concluded that the MACCS2 default DV values of 1 centimeter/second (cm/s) for unfiltered/unmitigated releases and 0.1 cm/s for filtered/mitigated releases may not be reasonably conservative for all DOE sites and accident scenarios.

HSS recently issued Safety Bulletin 2011-02, *Accident Analysis Parameter Update,* recommending the use of the newly developed default DV, 0.1 cm/s for an unmitigated/unfiltered release. Alternatively site specific DV values can be developed using GENII version 2 (GENII v2) computer code.

Key input parameters for calculating DV values include surface roughness, minimum wind speed, particle size, and particle density. This paper will include reasonably conservative inputs, and a truncated parametric study.

In lieu of the highly-conservative recommended DV value (0.1cm/s) for unmitigated/unfiltered release, GENII v2 has been used to justify estimated 95th percentile DV values. Also presented here are atmospheric dilution factors (χ/Q values) calculated with the MACCS2 code using the DV values form GENII v2, χ/Q values calculated directly with GENII v2, and a discussion of the benefits of each method.

This paper will give an overview of the process of calculating DV with GENII v2 including a discussion of the sensitivity of input parameters.