

SAWG Workshop to Discuss Issues Regarding Dispersion Modeling

Layout for Dispersion Modeling Discussion: Panel & Workshop

Panel Thursday, May 10, 9:45 – 12:00
Workshop Thursday, May 10, 1:00 – (as late as) 5:00

Panel Title: **Atmospheric Dispersion Modeling in Safety Analysis**

Description: The panel will address current issues and challenges in atmospheric dispersion modeling for site specific safety analysis application. This will include topics of deposition velocity as described in the recent HSS Safety Bulletin, codes such as MACCS and GENII, and choice and acceptance of conservatism's in particular parameters in modeling as well as within the overall modeling. It will discuss the various perspectives of the Department of Energy HQ, DOE field offices, contractors, and various experts. This will serve in conjunction with a number of papers presented in earlier sessions to feed an afternoon working session as support to DOE in establishing an integrated/coordinated approach for responding to the HSS Safety Bulletin and broader dispersion modeling issues.

Panel Members & Topics: Thursday, May 10, 9:45 – 12:00

Chair, Andrew Vincent, SRNS:	Panel Introduction, and SRS Experience
Caroline Garzon, EM-40 - DOE Lead	DOE Mission/Intent with respect to Dispersion Modeling; Germantown workshop introduction
Brian DiNunno, HSS & Dep Rep	Policy perspectives; Background on development of HSS Safety Bulletin; Related dispersion modeling parameters/philosophies (e.g. 25 Rem EG)
Ray Sartor, LANL	LANL Dispersion Data Comparison to MACCS Prediction
Nate Bixler, LANL	MACCS2 ; How χ/Q calculated; Parameters and their conservatism; Overall model conservatism and uncertainty; vulnerabilities; New version / Improvements
Jeremy Rishel, PNNL	Current Toolbox Models: GENII and GENII2 ; How GENII is used in DOE; How GENII calculates deposition velocity- Can this method be standardized, and should it be, if it is used?
Jorge Schulz, Bechtel	Relate WTP Experience
Bruce Wilson, BWXT Y-12	Oak Ridge experience
Potential DNFSB	Technical Perspectives

- Andrew Vincent Introduction
- Mukesh Gupta Summary of AA survey for dispersion modeling codes
- Summary of papers presented earlier in the workshop:
 1. Vincent – Dispersion Modeling Analysis for SRS
 2. Hope – Comparison of Parameters for Modeling Tritium Dispersion
 3. Cathey – Deposition Velocity Impact on the PNNL Radiochemical Processing Laboratory
 4. Schira – Deposition Velocity Estimation with the GENII2 Computer Code
 5. Wang – Application of ARCON96 and AERMOD for Onsite and offsite Doses
 6. Sartor – Requirements and Guidance for Generating MACCS2 Met Data Files

- All participants: **Discussion Topics**
 - Types of models (hit on CALPUFF and AERMOD); model uncertainty
 - MACCS2
 - MACCS2 Guidance Report tables, going entry by entry to have discussion about issues and potential path forward:
 - Table 4.1 Standard Practices and Assumptions
 - Table 6.1 Limitations of Gaussian Plume Model
 - Understanding of how MACCS2 calculates χ/Q
 - Discussion of parameters in MACCS2 and their conservatism
 - Overall conservatism and uncertainty in MACCS2
 - Identify other vulnerabilities in MACCS. When is it not an ideal tool?
 - New versions of MACCS2
 - What does it improve
 - How to get into the HSS Toolbox
 - How do we ensure a standardized, reasonably conservative approach in calculating dose?
 - Comparison of NUREG 1.23 and EPA-454 methodology
 - GENII and GENII2; How GENII is used in DOE; How GENII calculates deposition velocity- Can this method be standardized, and should it be, if it is used?
 - Can we develop a standardized approach to calculating deposition velocity? Or can we select a default value that will give all sites a reasonably conservative estimation of dose?
 - What are the implications of pursuing other models? (i.e. Lagrangian puff)
 - Validation
 - Appropriate guidance on which model to use when
 - Appropriate guidance resulting in consistent application
 - Guidance for use of deposition velocity outside of the limited DOE-STD-3009 setting
 - HSS Safety Bulletin
 - DOE Orders
 - Plans: MACCS2 Guidance Update, Accident Analysis Handbook
 - Range of parameters in overall dose calculation (including dispersion)
 - Options (NRC?)

SOME SITE-SPECIFIC ISSUES:

SRS:

- Deposition velocity of tritium
- Deposition velocity of particulates
- Surface roughness and how it applies to dispersion coefficients
- Dispersion coefficients- how to select the best set of coefficients for the site
- Meteorology input file- acceptable methodology for obtaining data (includes normalization of data)
- X/Q for 100 meter worker
- Possible change in controls
- SR looking to develop consistent multi-contractor meteorology base for dispersion – usable model for other sites?

Y-12:

- Reasonable conservative site-specific calculation for DV (includes appropriate parameters, etc)
- Possible impact of calculation from one facility affecting another- possible change in controls
- Dispersion coefficients- how to select the best parameterization for the site
- Extremely slow/calm wind speeds
 - If more than 5% of data is in calms, is MACCS accurate?
 - Is it conservative?
- DR and ARFxRF values sufficiently conservative.

HSS:

- Needs to update MACCS2 guidance
- How to incorporate in standards and handbooks
 - What level of detail in 3009
 - What to include in accident analysis handbook

OTHER:

- Future NSR&D efforts