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Project #:

Subject:

Comments: Matthew - Here is an abstract from a report in which the simple Gaussian model (the ISC model, which uses EPA σ's) is compared with field data and with predictions of more complicated models.

After checking around a bit, I conclude that there has not been a specific evaluation of Briggs' σ curves with field data in the 10 to 50 Km range. Our "good feeling" about the model at those distances is the result of (1) a few experiments such as the one in the attachment, and (2) thousands of applications to industrial sources in which the results were "reasonable" at $x \sim 10$ to 100 Km.

There are more field data in the $x > 100$ Km range (for long-range acid rain problems) than in the $10\text{Km} < x < 100\text{Km}$ range!

Steve

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EARTH TECH

FAX

NRC FORM 335 (11-81) U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

1. REPORT NUMBER (Assigned by DDC)
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ARAP Report No. 505

4. TITLE AND SUBTITLE (Add Volume No., if appropriate)
Comparison of the 1981 INEL Dispersion Data with Results from a Number of Different Models

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3. RECIPIENT'S ACCESSION NO.

7. AUTHOR(S)
W.S. Lewellen, R.I. Sykes and S.F. Parker

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MONTH January YEAR 1985

9. PERFORMING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code)
Aeronautical Research Associates of Princeton, Inc.
50 Washington Road
Post Office Box 2229
Princeton, New Jersey 08540

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8. (Leave blank)

12. SPONSORING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code)
Division of Radiation Programs and Earth Sciences
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16. ABSTRACT (200 words or less)
Results from simulations by 12 different dispersion models are compared with observations from an extensive field experiment at the Idaho National Engineering Laboratory in July,1981. Comparisons were made based on hourly ground-level SF_6 samples,out to approximately 10 km from the 46 m release tower, both during and following 7 different 8-hour releases. Comparisons are also made for total integrated doses collected out to approximately 40 km. Within the limited range appropriate for Class A models this data comparison shows that neither the puff models or the transport and diffusion models agree with the data any better than the simple Gaussian plume models. The puff and transport and diffusion models do show a slight edge in performance in comparison with the total dose over the extended range appropriate for Class B models. The best model results for the hourly samples show approximately 40% calculated within a factor of two when a 15° uncertainty in plume position is permitted, and it is assumed that higher data samples may occur at stations between the actual sample sites. This is increased to 60% for the 12 hour integrated dose and 70% for the total integrated dose. None of the models reproduce the observed patchy dose patterns. This patchiness appears to be consistent with the inherent uncertainty associated with time averaged plume observations.

17. KEY WORDS AND DOCUMENT ANALYSIS

17a. DESCRIPTORS

atmospheric dispersion
concentration patterns
dispersion models
Gaussian plume models
model evaluations
puff models

17b. IDENTIFIERS/OPEN-ENDED TERMS

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