



Engineering Sciences Section – 2005

C43 Reconstruction of a Hazardous Material Release Using Real-Time Air Monitoring Data and Air Dispersion Modeling

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The goal of this presentation is to focus on the value of air monitoring data and air dispersion modeling to assess potential exposures, determine release rates for emergency planning purposes, and defend against unreasonable litigation claims. The conceptual use of such data will be drawn from specific experience in emergency responses.

This presentation will impact the forensic community and/or humanity by demonstrating real examples of accident reconstruction from a health-based perspective

After the spill of a hazardous chemical, questions invariably arise regarding the exposure of individuals impacted by the release. Various tools are used to assess the magnitude of such exposures. Atmospheric dispersion modeling allows estimation of concentrations in space and time over the potentially affected area. These estimated air concentrations can be coupled with exposure information for specific individuals (time of exposure, location of exposure, etc.) to estimate inhalation exposures. Historically, atmospheric dispersion modeling has been the tool of choice for reconstructing hazardous materials releases.

Geolocated air-monitoring data allow one to pinpoint specific concentrations at specific locations and times. Combining air-monitoring data with atmospheric dispersion modeling allows better estimation of chemical concentrations over large areas. These air monitoring “data checkpoints,” which are used to determine whether modeled concentrations match reality, vastly improves reconstruction of chemical exposures after the spill of a hazardous chemical. Uncertainties associated with each component will be discussed, and additional factors that will require additional research and development will be mentioned.

Reconstruction, Accident, Dispersion