



Sentinel Exposure Event Surveillance and Evaluation for DOE Sites

Purpose: To 1) develop a system of methods and integrated computer software for use at Department of Energy (DOE) nuclear weapons production plants, as well as plants undergoing decommissioning and decontamination, to systematically evaluate employees' potential occupational exposures to chemicals and ionizing radiation, and 2) identify important components of those systems and to develop strategies to resolve barriers that hamper their adoption. This effort involved the use of information from the Rocky Flats Environmental Technology Site (RFETS, also known as Rocky Flats or the Rocky Flats Plant). The study was conducted by outside researchers under a competitively awarded grant by the National Institute for Occupational Safety and Health (NIOSH) in the US Department of Health and Human Services (DHHS). The grant was funded under a Memorandum of Understanding between DOE and DHHS under a program to develop new scientific information that will help DOE to evaluate whether employees at nuclear weapons production plants are at potential risk of adverse work-related health effects from occupational exposures. Findings from the grant do not necessarily represent NIOSH policy or endorsement. NIOSH health effects research at DOE facilities affect the well-being of more than 600,000 workers in the U.S. and more than 10 million worldwide.

Findings: The research investigators report that the collection of job task descriptions and the integration of these data with exposure data is the most important standardized component of exposure surveillance. Organizational support for interpretation of exposure data is vital to reduce ongoing exposures for certain job tasks, even though exposures may be below regulatory limits. With modern computer hardware and software, the cost and time to implement such systems is relatively modest. Six articles were published presenting the work conducted under this grant. A brief description and citation for each of the published documents describing the grantees' work are provided below. The authors indicate that this system should be broadly applicable to DOE sites and in general industry.

Contact: For further information on this study, please contact the principal investigator, A. James Rutenber, Ph.D., at (303) 315-5627 or by email (jim.rutenber@uchsc.edu). For additional information on the exposure surveillance data system, or to obtain a copy of the database software, please visit <http://www.bernardino.colostate.edu/oedb/oedb.html>.

Publications:

Exposure Databases and Exposure Surveillance: Promise and Practice

This article emphasizes the utility of integrating occupational exposure databases and surveillance systems that electronically gather, store, manage and analyze data, and further guide occupational prevention efforts. A foundation for practical and effective exposure surveillance systems is proposed based on the integration of recent developments in electronic occupational exposure databases, the codification of exposure assessment practice, and the theory and practice of public health surveillance.

LaMontagne AD, Herrick RF, VanDyke MV, Martyny JW, Rutenber AJ [2002]. Exposure databases and exposure surveillance: promise and practice. *AIHA J*, 63:205-212.

Development and Piloting of an Exposure Database and Surveillance System for DOE Cleanup Operations

This case study of RFETS is presented in terms of the various steps required to develop occupational exposure database and surveillance systems in any work context: gaining organizational support; defining the purpose and scope of the system; defining database elements and how to code them (including potential exposure determinants); planning efficient analysis strategies; incorporating reporting capabilities; and anticipating communication strategies that maximize the probability that surveillance findings will feed back to preventive applications.

LaMontagne AD, VanDyke MV, Martyny JW, Simpson MW, Holwager LA, Clausen BM, Rutenber AJ [2002]. Development and piloting of an exposure database and surveillance system for DOE cleanup operations. *AIHA Journal*, 63:213-224.

Development of an Exposure Database and Surveillance System for Use by Practicing OSH Professionals

Health and safety professionals at RFETS needed a method to evaluate worker exposures and consequently, provide useful information for the development of preventive strategies. This article provides a thorough description of how a user-designed exposure database was created and implemented at the RFETS.

VanDyke MV, LaMontagne AD, Martyny JW, Rutenber AJ [2001]. Development of an exposure database and surveillance system for use by practicing OSH professionals. *Appl Occup Environ Hyg*, 16(2):135-143.



Integrating Workplace Exposure Databases for Occupational Medicine Services and Epidemiologic Studies at a Former Nuclear Weapons Facility

Complex data systems have been developed in the fields of industrial hygiene, occupational medicine, and epidemiology; however, further effort is needed to integrate this information for protecting worker health. Using the RFETS as an example, this paper identifies the benefits and problems related to occupational exposure databases, and illustrates how epidemiologic and industrial hygiene databases can be integrated. The authors demonstrate how a job exposure matrix database is used to estimate cumulative exposures over different time periods for epidemiologic studies and to provide notification and determine eligibility for a medical screening program developed for former workers.

Ruttenber AJ, McCrea JS, Wade TD, Schonbeck MF, LaMontagne AD, VanDyke MV, Martyny JW [2001]. Integrating workplace exposure databases for occupational medicine services and epidemiologic studies at a former nuclear weapons facility. *Appl Occup Environ Hyg*, 16(2):192-200.

Cleanup Worker Exposures to Hazardous Chemicals at a Former Nuclear Weapons Plant: Piloting of an Exposure Surveillance System

Independent researchers and industrial hygienists at the RFETS piloted an exposure database and surveillance system. This paper presents the feasibility of implementing an integrated occupational exposure database and surveillance system by practicing industrial hygienists employed in industry as well as the preventive potential and research uses of such systems. This exposure database and surveillance system – the central features of which are applicable in any industrial work setting – has enabled one of the first systematic quantitative characterizations of DOE cleanup worker exposures to hazardous chemicals.

LaMontagne AD, VanDyke MV, Martyny JW, Ruttenber AJ [2001]. Cleanup worker exposures to hazardous chemicals at a former nuclear weapons plant: piloting of an exposure surveillance system. *Appl Occup Environ Hyg*, 16(2):284-290.

Exposure Surveillance for Chemical and Physical Hazards

Hazard surveillance has a great potential to prevent detrimental health outcomes. This chapter explains the utility of hazard surveillance and provides a case study of RFETS to illustrate the development and piloting of an exposure surveillance system.

LaMontagne AD, Ruttenber AJ, Wegman DH [2000]. Exposure surveillance for chemical and physical hazards. In Maizlish N, ed. *Workplace Health Surveillance: Principles & Practice*. New York: Oxford University Press, pp. 219-234.

Disclaimer: Mention of any company or product does not constitute endorsement by NIOSH. The conclusions, recommendations, and opinions presented in grant reports and publications are those of the independent investigators conducting the work funded by the grant.

Further NIOSH Information

For a copy of the journal abstracts, call:

1-800-356-4674

For a summary of NIOSH research involving DOE workers visit: <http://www.cdc.gov/niosh/oerp>

NIOSH/HERB Contact Points for Further Information...

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