standards addressing abatement of hazards associated with lead in buildings. The scope of E06.23 is "to develop standards that address the identification, reduction, and elimination of hazards associated with lead in paint, dust, soil, and airborne particulates found in and around buildings." Since 1991, the Subcommittee E06.23, which presently has about 80 members, has developed 26 standards. The work is performed under the direction of 13 Task Groups and covers a range of subjects including sampling and analysis, visual evaluation of paint condition, encapsulants, risk assessment, and management of lead in buildings, and terminology. Most recently, the Subcommittee has been reviewing lead-hazard evaluation standards that have been issued, or are under development, for consistency with the EPA rule issued under Section 403 of the Title X Act. Two E06.23 standards, E1728 (Dust Wipe Sampling) and E1792 (Dust Wipe Specification) are referenced in the rule.

268.

BLOOD LEAD EXPOSURE AMONG U.S. WORKING POPULATION. A. Yassin, J. Martonik, U.S. DOL/OSHA, Washington, DC

Data from the Third National Health and Nutrition Examination Survey (NHANES III, 1988-1994) (n = 11,228) of U.S. working population aged 18-64 years were used to determine the mean blood lead levels in selected occupations, industries and socio-demographic factors. The overall mean blood lead level for all the U.S. working population aged 18-64 years was estimated at 2.43 µg/dl, with 95% confidence interval [CI]= (2.27, 2.59). Among U.S. workers, vehicle mechanics had mean blood lead levels 5.13 µg/dl, and 0.07% of the U.S. workers in the metal industry had blood lead levels ≥ 50 µg/dl. Construction laborers had blood lead levels 4.30 mg/dl, and 4.69% of these construction laborers had elevated blood levels ≥ 25 µg/dl. Ordinary least square regressions demonstrated that repair services, mining and construction industries were significantly associated with elevated blood lead level ($p \leq 0.05$). Results from logistic regression analyses indicated that workers with blood lead levels ≥ 5 µg/dl are more likely to report weakness/paralysis on face, arm, leg for more than five minutes than do those workers with blood lead levels < 5 µg/dl (adjusted odds ratio [OR] =1.25, 95% confidence interval [CI] = (0.87, 1.78)). Although there were low blood lead levels for the entire working population, the results showed that there were still high blood lead levels in certain occupations and industries.

269.

EARLOBE SAMPLING FOR LEAD SURVEILLANCE: AN EVALUATION OF THIS SAMPLING TECHNIQUE WITH OCCUPATIONALLY-EXPOSED ADULTS. L. Taylor, A. Kevin, J. Deddens, NIOSH, Cincinnati, OH; R. Jones, NCEH, Atlanta, GA; L. Kwan, University of California at Los Angeles, Los Angeles, CA

Employees who are monitored for lead exposure must routinely have a venipunciture sample taken, which is both uncomfortable and normally collects more blood than needed for analysis. Capillary sampling is less invasive but introduces the possibility of surface contamination. The objective of this study was to compare venous and capillary (earlobe) blood lead samples obtained from occupationally exposed individuals. Phlebotomists with specific training for the collection of blood lead samples, collected two venous blood samples and two capillary earlobe samples from each participating employee. Prior to the capillary draw, the employee's earlobe was cleaned with an alcohol wipe in an effort to remove potential lead contamination. A second alcohol wipe was then used to sterilize the lancing area and was retained for lead analysis. Both the venous and capillary blood lead samples were analyzed by graphite furnace atomic absorption spectrometry (GFAAS) in a CDC laboratory. The venous blood lead results were considered the reference collection method. A total of 126 paired, earlobe and venous samples were collected and analyzed. Capillary earlobe sampling was preferred to venous sampling by 54% of the employees. The mean difference between the capillary and venous results was 38.8 mg/dL ± 48.1. Earlobe blood lead concentrations were more than twice the venous results in over half (64/126) the samples. Despite a simple cleaning with an alcohol wipe and no visible lead contamination, 94% of the earlobe wipe samples contained lead contamination greater than 0.3 mg lead per wipe sample. Even low levels of contamination significantly alter the blood lead concentration as a sample contamination of 0.3mg lead in a 200mL blood sample would cause a 150mg/dL elevation. Until satisfactory cleansing techniques are identified and evaluated, this study suggests capillary earlobe sampling should be avoided as a means for occupational blood lead surveillance.

PF 135. Computer Applications in Industrial Hygiene

Papers 270–280

270.

THE NET PRESENT VALUE APPROACH TO EH&S INVESTMENT. D. Tietjen, TRW, Clearfield, UT

The paper will explain the preparation of EH&S project requests in terms of Net Present Value, using basic data such as numbers of employees, square footage, totals of HazMat usage, and permit numbers to extrapolate the value of EH&S information management investment to the enterprise. Current software such as the ROCHE model will be used with actual data sets to demonstrate the Net Present Value justification process. Basic accounting principles will be applied to a fictitious EH&S system investment to exemplify how the enterprise can transform present day capital expenditures into long-term corporate assets.

271.

TRIALS AND TRIBULATIONS OF THE INTEGRATED DATA QUEST. S. Moss, TRW, Clearfield, UT

The session is designed to demonstrate, through actual examples, the issues encountered while implementing Environmental, Health and Safety information technology. Data verification and validation challenges will be discussed along with the burdens of data stewardship responsibility. The paper will detail the real cost associated with cross media data validation and the theoretical and actual cost savings achieved. Relative value of single-set data management verses multi-set data management will be analyzed and ranked. Benefits in terms of system and manpower costs will be discussed as they relate to the issues arising from change and standardization. Autonomy and decentralized management concerns, relating to system and data standardization projects, will be reviewed with open comment participation.

272.

MAXIMIZING THE USE AND BENEFITS OF USING INDUSTRIAL HYGIENE DATA TO SUPPORT THE JOB HAZARD ANALYSIS PROCESS. J. Sherrill, T. Ford, BWXT Y-12, L.L.C., Oak Ridge, TN

This presentation demonstrates the processes, experience and benefits of integrating Industrial Hygiene (IH) data to support a site wide Automated Job Hazard Analysis (AJHA) system. The integration of IH data such as sampling, exposure assessment, hazard inventories, material safety data sheets and chemical inventories with the AJHA program gives the IH and non-IH job planner the ability to quickly answer many questions they could not otherwise accurately and safely answer. This presentation covers the real experience, costs, successes and challenges of implementing this type of highly integrated computerized information system at a site. In addition, it discusses the importance of meeting this integration challenge to make the field of Industrial Hygiene an important part of the site safety strategy rather than just an obscure and often under-funded group of people who does some OSHA monitoring and a few permits.

273.

IMPROVING THE QUALITY AND EFFICIENCY OF SELF-ASSESSMENTS FOR EHS IN A HOSPITAL WITH HAND-HELD COMPUTERS. D. Malter, Malter Associates, Inc., Woodridge, IL; A. Galat, Northwestern Memorial Hospital, Chicago, IL

Hospital employees are required to perform a substantial number of EHS, infection control and accreditation and licensure assessments. As a result, staff is constantly collecting surveys and preparing reports, with little time to assist with the development or follow-up of corrective actions.

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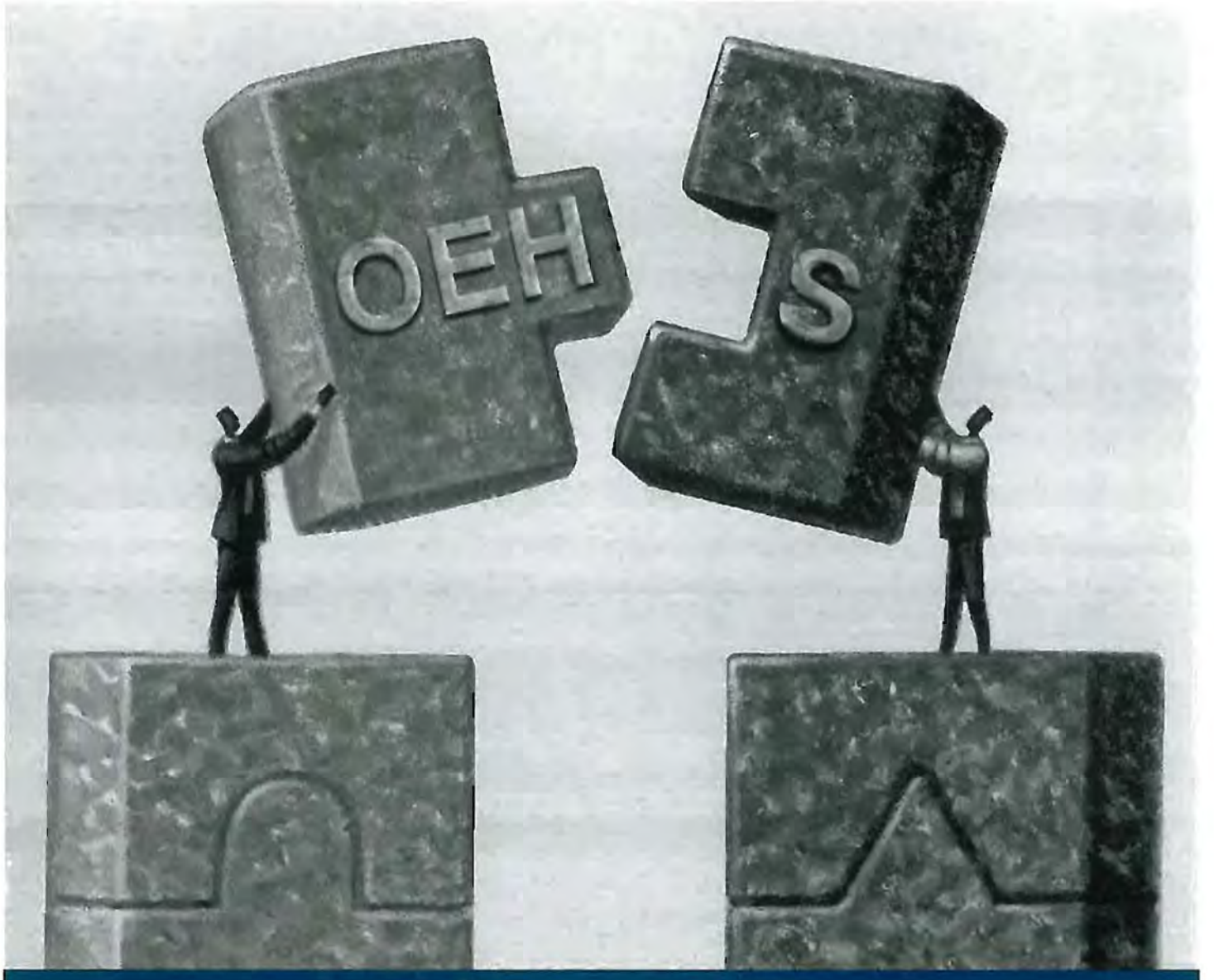

ABSTRACTS

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2002 Abstract Index by Session Topic

PF 101 Agricultural Health and Safety

Papers 1–6

1.

RELATIONSHIPS BETWEEN WORK EXPOSURE AND RESPIRATORY OUTCOMES IN POULTRY WORKERS.

S. Kirychuk, J. Dosman, P. Willson, L. Dwernychuk, University of Saskatchewan, Saskatoon, SK, Canada; J. Feddes, A. Senthilselvan, C. Ouellette, University of Alberta, Edmonton, AB, Canada

A pilot study was conducted on 74 poultry barn workers in Western Canada during the winters of 1998–2000. General respiratory health, current, chronic and work related respiratory symptoms; general work duties, and work-site factors were ascertained, pre-exposure, by questionnaire. Personal airborne exposure levels and changes in symptoms and lung function were measured across the work-shift for all workers. Workers were classified according to the type of poultry operation (floor based, n=53; cage based, n=13) in which they worked. There was no significant difference in daily hours spent in the barn between those who worked with caged poultry (5.41±2.35 hours) and those who worked with floor-based poultry (4.42±2.48 hours). Age of birds was 47.10±58.36 days for floor based versus 155.91±63.01 days for cage based facilities. There were no significant differences in personal environmental measurements between cage-based and floor-based facilities (ammonia 13.22±13.70 ppm, 17.34±16.35 ppm; total dust 5.74±4.85mg/m^3, 10.01 ±8.84 mg/m^3; endotoxin 6046±6089 EU/m^3, 5457±5934 EU/m^3 respectively). There were no significant differences in across work-shift change in pulmonary function indices between workers from cage and floor-based operations. For the entire sample total dust dose (work hours/day x total dust) significantly correlated with across-shift change in FEV_1, whereas endotoxin dose and ammonia dose did not. Stocking density was significantly correlated with average ammonia (ppm, p=0.002) and ammonia dose (ppm x work hours/day; p=0.004) in floor based operations and with total dust (particles/ml, p=0.002) in cage based populations. Stocking density was also significantly correlated with chronic cough (p=0.003) and across work-shift cough (p=0.05) and chest tightness (p=0.06) for workers from floor based operations; and with phlegm when working (p=0.018) and chest tightness across the work-shift (p=0.004) for workers from cage based operations. Type of poultry production operation and therefore type of work exposures appear to significantly impact symptoms experienced by workers exposed to these atmospheres.

2.

DUST GENERATION SYSTEM FOR AGRICULTURAL SOIL DUST.

K. Lee, R. Domingo-Neumann, R. Southard, UC Davis, Davis, CA

Agricultural workers are prone to exposure to mixed dust of inorganic and organic compounds. Diverse working conditions and operations in agriculture make direct measurements of the mixed dust exposure difficult. This study was conducted to develop a new dust generation system to determine possible exposure potency indicators of soil samples. The dust generator consists of a blower, a rotating chamber and a settling chamber. The rotating chamber has inner baffles to provide sufficient agitation of the samples while the chamber is rotating. A blower provides air into the rotating chamber, and the suspended dust is moved to the settling chamber through a perforated pipe. A small fan inside the settling chamber helps maintain suspension of the dust. Various size fractions of dust are sampled on filters suspended in the chamber via outlet ports and attached pumps. Air pressure is released through a filter plate mounted on the wall of the settling chamber. Various operating conditions were evaluated: air intake from blower, speed of rotation, soil mass and sampling time. To evaluate the characteristics of dust from the system, we collected dust samples from agricultural fields while the soil was prepared for