recognize the risk. The presentation will include a review of what these organizations have done. There is not a quick fix to this issue. The answer requires engaging employees in a process that develops understanding and buy-in for the need to understand and change. For some of the factors identified peer-to-peer interaction is often required.

83

A MANAGEMENT APPROACH TO CREATING ENVIRONMENT, SAFETY AND HEALTH WORKPLACE PARTNERSHIPS TO REDUCE COSTS AND IMPROVE PERFORMANCE. K. Grant, Air Force Institute for ESOH Risk Analysis, Brooks AFB, TX; J. Garland, U.S Air Force School of Aerospace Medicine, Brooks AFB, TX.

An approach to creating workplace partnerships between environment, safety and occupational health (ESOH) professionals and industrial shop management, for the purpose of reducing costs and ESOH risks and improving performance, is described. The approach was demonstrated in a corrosion control shop at Robins AFB, GA. Shop management became interested in working with ESOH experts to reduce costs when preliminary studies showed that 39% of costs associated with stripping and painting aircraft components were linked to ESOH policies and requirements. By presenting as consultants rather than inspectors; establishing up-front goals, deliverables, and timelines; and providing assurances of data confidentiality, ESOH professionals were successful in gaining access to and cooperation from shop personnel. Efforts began with a review of current work practices and ESOH concerns in the shop. This endeavor resulted in a brainstorm list of 293 improvement ideas, focusing on personal protective equipment use, hazardous waste disposal, and ergonomics. After review and discussion with the shop, 54 of these ideas were targeted for further examination and development. Subsequent work focused not only on developing the additional technical information required to implement the idea, but also on providing cost-benefit data to justify implementation to shop management. Ideas were categorized into three groups (green, yellow and red) based on the ease of implementation and the potential to reduce costs. Again, the information was provided to the shop for review, discussion and further refinement. As a result, the shop has accepted seven recommendations for immediate implementation, and is considering an additional twenty for execution in the near-term. More importantly, by establishing themselves as problem solvers and "honest brokers," ESOH professionals continue to work with the shop and to influence long-term planning and investment decision-making activities. A similar approach may be helpful to other organizations seeking to effect ESOH changes in the workplace.

84

SAFETY AND HEALTH IN A GROUP OF MEXICAN INDUSTRIES: THE POINT OF VIEW OF THE MANAGERS. H. Tovalin, SPHUT, UNAM-MEXICO, Houston, TX.

OBJECTIVES

The objectives of this study was to get from a group of managers an evaluation of safety and health conditions in their plants and their proposals of control. A survey was applied during 1998 as part of the research project "NAFTA's impacts in six industrial activities in Mexico," to managers of 198 plants of the automobile, shoes, cement, textile, groceries and glass industries, located in the cities of Mexico, Puebla, Monterrey and Guadalajara.

METHODS

The sample size of each activity in the different cities was calculated in base to the industrial census. First the Human Resources Managers of each plant were contacted by phone, and the questionnaires were sent by mail. Special trained surveyors were sent to those plants that did not return the questionnaire to talk with the managers.

RESULTS

The most frequent health and safety problem reported by the managers were accident; no one identified the presence of occupational diseases. Most of the managers related the occurrence of injuries with equipment in bad state, lack of use of PPE, bad supervision and inadequate work stations. Less than 50% of the plants had occupational health preventive programs, and 20 to 40% of the plants had professional safety and health personnel. The investment in safety and health was analyzed in releation to the total production costs. The expenses of PPE were 1% to 5% of the total production costs, the purchases of safety equipment were 1% and the payments of primes by injuries and illnesses were 1%.

CONCLUSIONS

These results show that most of the interviewed managers could not identify the safety and health problems in their plants, never had applied health and safety policies, preventive programs or have professional personnel. The lower investment in safety and health equipment and materials is related with this managerial attitude.

Occupational Epidemiology Papers 85–95

85

EVALUATION AND CONTROL OF WORKERS' EXPOSURES IN THE COLLECTION AND PRESERVATION OF HISTORIC ARTIFACTS. G. Burroughs, NIOSH, Cincinnati, OH; K. Makos, Smithsonian Institution, Washington, DC; T. Radtke, Dept. of Interior, Denver, CO.

NIOSH, the Smithsonian Institution, the Department of Interior, and several other partners are conducting a study of the exposures of museum employees to toxic substances in the collection and preservation of historic artifacts. Based on recommendations from knowledgeable individuals, professional associations, prior studies and internal research interests, three categories of exposures were selected for investigation. These categories include heavy metal pesticides, silica and dust, and solvents. The professional societies and experts mentioned above not only provided support in defining the scope of the study, but also assisted in selecting sampling sites based on criteria developed cooperatively, and subsequently aided in establishing contacts within those sampling sites to facilitate testing. In many instances the facilities in which the evaluations were conducted also provided valuable assistance in the collection of data, a resource found to be of great significance when it was determined that even in large museums it was common for a small number of employees to be performing the tasks of interest at any given time. Data developed in this work indicate: · a high degree of variability in the duration of exposures, ranging from a few minutes to several hours per day · a generally low level of exposure to all substances investigated, in many instances <10% of the TLV for TWA exposures · some short duration high level exposures, up to 30 mg/m3 respirable dust estimated to contain 25 to 30% quartz · biological measures of dose less than half of the BEI for pesticides · occasional short-term exposures to solvents exceeding the STEL. Results indicate that this type of cooperative planning and testing provides several organizational and financial benefits, and the employees' exposures were shown to be well controlled in most of the testing conducted.

86

EXPOSURE SURVEILLANCE OF MUSEUM WORKERS TO RESIDUAL PESTICIDES ON COLLECTIONS. K. Makos, Smithsonian Institution, Washington, DC; G. Burroughs, NIOSH, Cincinnati, OH.

From the 18th century to the mid-20th century, a variety of pesticides were commonly applied to organic specimens in museum and academic collections as a preservative and insecticide. Two of the most widely used chemicals were inorganic arsenic, primarily arsenic trioxide, and mercuric chloride. Residual particulates from these compounds, as well as sublimated mercury vapor, pose potential occupational exposures for conservators, collections managers, and research scientists whose jobs include the study, handling, and care of treated collections. As part of a joint project to characterize industry-wide exposures among museum employees, NIOSH and the Smithsonian Institution analyzed over 50 breathing zone air samples, 85 dermal wipe samples, and 25 total dose urine specimens for arsenic and mercury. Airborne arsenic levels and mercury vapor levels were reported at less than half the recommended maximums of 10 micrograms per cubic meter and 25 micrograms per cubic meter, respectively. Airborne mercuric chloride particulate was not detected. Total dose urine results have been below the respective BEIs and typically within their expected clinical range for the general population. Results suggest the effectiveness of gloves, careful specimen handling, use of HEPA-filtered vacuum cleaners for routine specimen and storage case cleaning, judicious use of ventilation to purge cases before specimen access, and employee awareness training in controlling exposures to residual pesticides in a museum environment.

87

MONTE CARLO ANALYSIS — A VALUABLE TOOL FOR ASSESSING HISTORIC AND FUTURE EXPOSURES. L. Birkner, McIntyre Birkner and Associates, Inc., Thousand Oaks, CA; J. Rasmuson, Chemistry and Industrial Hygiene, Inc., Wheat Ridge, CO.

When applied to exposure assessment, the goal of Monte Carlo Analysis (MCA) is to characterize, quantitatively, the uncertainty and variability in estimates of exposure and risk. Additionally, MCA can help identify the primary variables in a workplace that contribute to the overall variance of exposure. Such analysis can be useful for conducting epidemiologic studies, estimating future exposures in a new or modified workplace, or where exposure estimates can be helpful in the adjudication of a compensation or tort claim. MCA can be used as a framework to retrospectively model and estimate the most likely and range of possible exposures for a job or in a workplace when there is little or no exposure monitoring data available for the specific exposure under consideration. MCA is a stochastic computerized simulation process that permits years of exposures to be simulated and estimated. To successfully conduct

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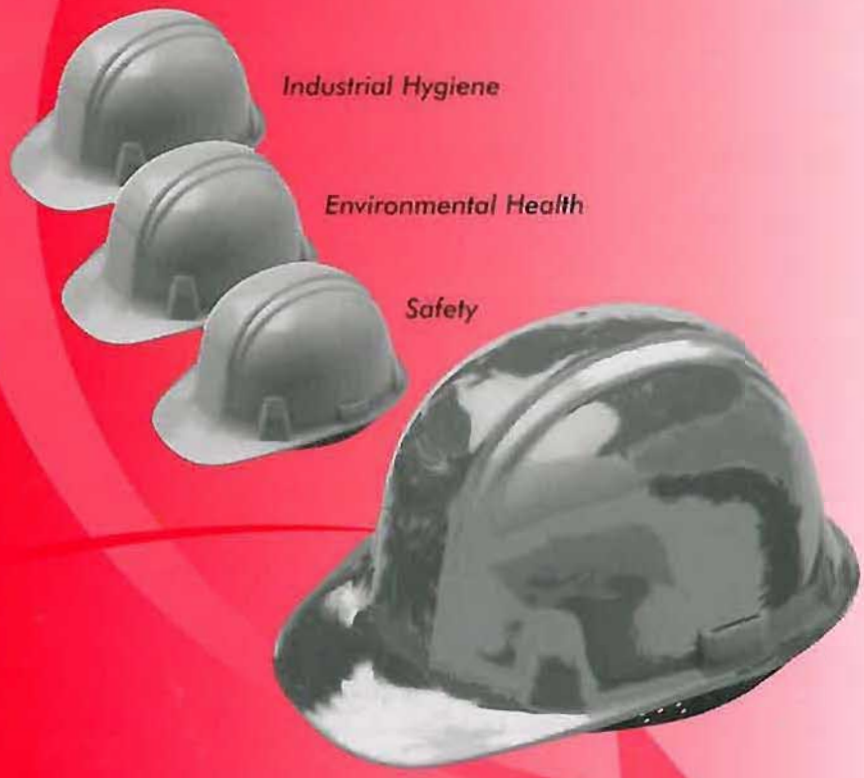

ABSTRACTS