Up With Life), Safety, Purchasing, plant management and employees. Lead by a core steering committee, a system was developed to implement an effective ergonomic program for over 7000 employees in various operating units throughout the division. Subcommittees within this group assume responsibility for team training, communications, new application of tools, computer use and engineering development.

Continuing efforts will be focused on employee education and awareness. Increasing the understanding of basic body mechanics, monitoring workplace incidence and implementing simple workplace modifications will help to minimize the number of injuries and reduce costs associated with ergonomic injuries.

474

EFFECT OF ROOF INCLINATION ON POSTURAL STABILITY AND PERCEIVED SENSE OF FALL R. Emerich, 24 Sesqui Drive, Rochester, NY 14624; A. Bhattacharya, P.A. Succop and A. Bagchee, Department of Environmental Health, University of Cincinnati Medical School, Cincinnati, OH 45267-0056.

The objective of this study was to develop a method of measuring postural sway on a sloped surface using a strain-gauge force platform and correlating the postural sway of the task being performed with the slope of the surface, the perceived risk (PR) of falling, and body sway. The sloped surface was used to simulate the roof surface. The force platform was used to measure the postural stability of the individual by measuring the amount of area (SA) traversed by the movement of the individual's center of pressure (CP). Various tasks were performed by fifteen subjects on both sloped surfaces and flat surfaces to simulate work tasks within the roofing construction and repair industry. For this study, slopes of 0°, 14° and 26° were chosen. The tasks were based on video data collected at a roofing site and motions commonly performed in the roofing industry. Tasks selected were forward lifts facing both up and down the slope, side-to-side lifts facing both up and down the slope, and standing erect and motionless. A questionnaire was developed to examine the correlation between perceived risk of fall and body sway and postural sway as measured by the force platform. The perceived risk was rated on a scale of zero to five. Zero was defined as no perceived risk and five as the riskiest. SA ranged from 0.8 cm^2 to 79.3 cm^2. A larger SA implied poorer balance. The average SA was 26.4 cm^2 and PR was 1.0. As the roof angle increased, the SA increased. PR showed a poor correlation with SA ($r = 0.23$, $p < .05$), implying that the subjects may not realize that they are near their Stability Boundary (SB) and may be in greater danger of falling. Repeated measures analysis of variance was used to study task effects, incline effects, and the interaction of tasks and inclines. All effects were significant ($p < .0001$). As the slope of the surface increased, so did proximity to SB. This also depended on the task. When standing still, both the SA and proximity to SB were worse for facing down the slope than facing up. For the side-to-side lifting task, the proximity to SB was closest and SA was highest. The forward reaching task showed that the subject's CP was closest to their SB facing up the slope, but that the SA was largest when facing down the slope. These results indicate that worker stability is dependent on the surface slope on which they stand and the task being performed. It is not true that the worker will always be able to sense when they are at an increased risk of falling.

476

A METHOD TO MAXIMIZE THE EFFECT OF LIMITED RESOURCES TO REDUCE THE RISK OF VDT--RELATED MUSCULOSKELETAL STRESS AT SITES WITH 1000's OF VDT WORKSTATIONS M.P. Hubbell, McDonnell Douglas Space Systems Co., 5301 Bolsa Ave., A3-316-12-1, Huntington Beach Ca., 92647.

A simple, computer-based, risk assessment survey method has been developed to identify and prioritize video display terminal (VDT) workstations with ergonomic deficiencies, to identify and prioritize all employees needing training on VDT ergonomic risk factors and proper workstation adjustment, and to identify those employees with current, significant discomfort and those employees with a history of previous wrist or hand surgery or treatment from any cause. By extraction of selected response data, workstations likely to pose significant risk and those VDT users at highest risk for injury or repeat-injury can be identified for initial allocation of resources.

This assessment tool incorporates the basic steps in the evaluation for potential ergonomic risk areas as seen in current proposed CalOSHA regulation. It also provides a method for employers to project budget needs for a multi-phased VDT workstation upgrade program. The survey incorporates 12 questions and response time is about 3 min. per employee. Each Dept. clerk inputs her group's data so survey manager receives only completed diskette. Results of this survey have verified the reported high incidence of musculoskeletal discomfort found among VDT users and demonstrates the correlation of discomfort with poor workstation arrangement and with average daily hours at the VDT.

477

AN ERGONOMIC STUDY OF VDT WORKSTATIONS IN OFFICE H. Lu, Department of Industrial and Manufacturing Systems Engineering, Louisiana state University, Baton Rouge, LA 70803; J. Caylor, Corporate Safety & Industrial Health Department, Freeport McMoRan Inc., New Orleans, LA 70112 ; F. Aghazadeh, Department of Industrial and Manufacturing Systems Engineering, Louisiana state University, Baton Rouge, LA.

In order to determine the extent of musculoskeletal illnesses among workers at VDT workstations and to prevent health problems, an ergonomic study of workstations was conducted among 190 clerical employees. A survey was designed with the intent of collecting information on users' background, health state, VDT tasks, VDT workstations, and work environment. Upon receipt of the completed questionnaires, observations, interviews and measurements at workplace were conducted. One hundred seventeen employees responded to the questionnaire; a response rate of 62 percent. The operators who participated in this survey were full time employees with an average working time of 8.2 hours per day, ranging from 7.75 to 10 hours per day. Ninety percent of clerical employees spent more than 4 hours per day working with VDTs. Types of VDT work included data entry, word processing, information retrieval, and telephone directory. The survey results indicate that thirty percent of operators experienced frequent or constant neck discomfort and headaches. Lower back pain, fatigue, and eye strain constituted the rest of complaints. On the other hand, the study revealed a lack of knowledge of workstation adjustment among the clerical workers. Interviews and observations at workplace showed that auxiliary workstation products such as the document holders, back rests, wrist rest, and anti-glare screens were effective in increasing the comfort and in reducing the symptoms at VDT workstations. It is concluded that the musculoskeletal disorders, visual symptoms, and stress among VDT operators can be reduced through better workstation design and training of VDT users. The training of VDT users on the basic ergonomics knowledge, workstation adjustment, the use of auxiliary products, and ways of working with VDTs is strongly recommended.

478

ERGONOMICS AND CONSTRUCTION: A REVIEW OF POTENTIAL HAZARDS IN NEW CONSTRUCTION S.P. Schneider and P. Susie, Occupational Health Foundation, 1126 Sixteenth St., NW, Washington, DC, 20036 .

Ergonomics is a growing field within occupational safety and health. Ergonomic hazards are those where the design of the work or workplace causes injury, e.g. musculoskeletal problems. Injury rates attributable to ergonomic hazards are skyrocketing, accounting for the majority of "occupational diseases" in the 1989 annual survey by the U.S. Bureau of Labor statistics. While interest and attention has been growing, most of the focus has been on industrial and office workers. Almost no research has been done in the U.S. on ergonomic problems of construction workers. This paper is a review of potential ergonomic hazards in construction work. It summarizes the findings from published literature reports as well as findings from a year-long investigation of health hazards on a new construction site in suburban Washington, D.C. The review is structured to follow the sequence of events in the construction of a new building. The review will also, simultaneously, refer to ergonomic solutions that exist, where they have been developed or devised. This review will only deal with the hazards of new construction. Renovation of existing structures, the segment of the work which is growing, is not discussed here. Many of the same problems and principles apply however.

Papers 479–487
Indoor Air Quality

479

CARBON MONOXIDE LEVELS IN SMOKING AND NON-SMOKING ESTABLISHMENT CASINOS: J. D. PAZ, and L. Walker, J & L, Inc., P.O. Box 33036, Las Vegas, Nevada 89133.

An indoor air quality survey was conducted of smoking and non-smoking gaming establishments. Surveys were performed because of recent newspaper articles which raised concerns about health effects of smoking on non-smokers and gaming employees.

Personal Short Term Exposure Levels (STEL) for carbon monoxide were conducted using a passive dosimeter, Model L, manufactured by Advance Optchemical Research, Inc. Area monitoring for CO, and 02 were performed in taverns with gaming, using PHD Biosystem Monitor.

"Alliances: Leading the Way Together"

American Industrial Hygiene Conference & Exposition '93

May 15 - 21, 1993

Ernest N. Morial
Convention Center
New Orleans, Louisiana

ABSTRACTS

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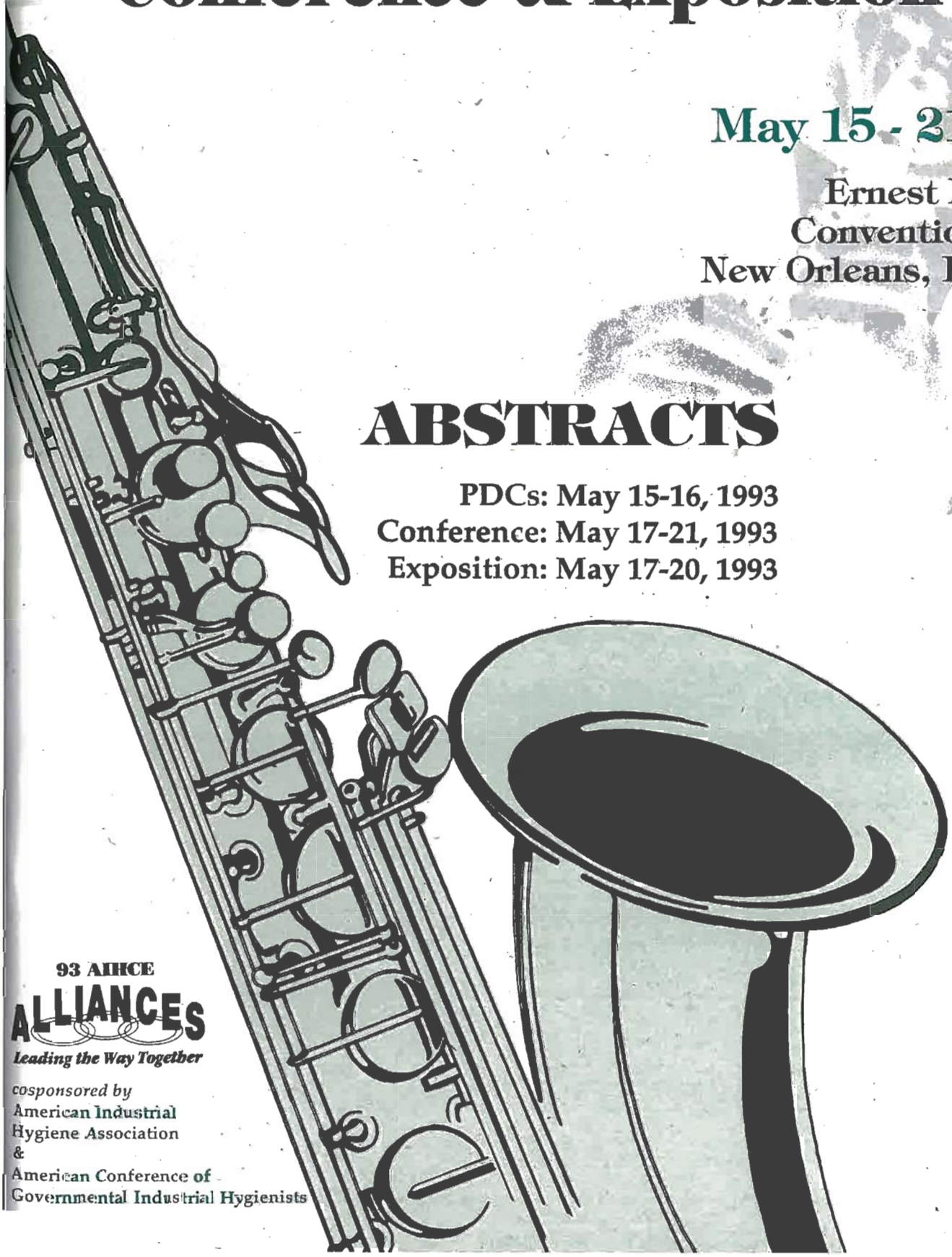

93 AIHCE
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