

DIESEL-POWERED VEHICLE EXHAUST VOLUMES IN U.S. ARMY MAINTENANCE FACILITIES. G. Berckman, U.S. Army CHPPM-North, Fort George G. Meade, MD.

The currently-used guidance for local exhaust ventilation (lev) design in diesel-powered vehicle maintenance facilities was extrapolated from empirically determined data collected at some point in the past. Diesel technology has come a long way since these standards were written, especially with the advent of the wide-spread use of turbochargers, and it is unclear whether these currently-used designs are adequate for proper contaminant removal. The first step in validating the efficacy of the current designs (or in devising new ones) is to determine exhaust flow volumes from the vehicles whose emissions we are attempting to control. This volumetric flow data can be used to validate currently-used design criteria or to prepare new lev standards for such vehicle emissions. Based upon the data collected during this project, the currently-used criteria for lev for turbocharged diesel-powered vehicles in Army maintenance facilities is excessive. Such criteria should be revised downward to a lev flow rate of 1320 cfm for most facilities which service commonly used vehicles such as commercial utility cargo vehicles, high-mobility military vehicles, and M816 wreckers. For shops that service larger equipment, such as M916 20-ton tractors, the required lev flow rate should be revised to 1740 cfm. It is the author's intent that these data will be used, as stated above, to validate currently-used design criteria, or, failing that, to prepare new lev standards for such vehicle emissions.

257

AIRPORT "CHECKED BAGGAGE" SCREENER EXPOSURE TO INTERNAL COMBUSTION ENGINE EXHAUST PRODUCTS. M. Methner, NIOSH, Cincinnati, OH; L. Delaney, NIOSH, Atlanta, GA.

The Transportation Security Administration (TSA) requested the National Institute for Occupational Safety and Health (NIOSH) to evaluate airport "checked baggage" screeners' exposure to diesel particulate matter (DPM), carbon monoxide (CO), nitric oxide, nitrogen dioxide, and other products of combustion. Exposures were believed to be related to internal combustion baggage tug engines operating near the screeners. Four international airports (Palm Beach, Miami, Baltimore-Washington, and Dulles) were selected for air monitoring studies. The selection criteria included the following: (1) prior complaints from TSA workers regarding exhaust emissions; and (2) the location and arrangement of the check baggage stations (open versus enclosed screening areas). Each airport study was designed to collect the same information so that air monitoring data could be compared across airports. Personal breathing zone (PBZ) and ambient air samples were collected and analyzed in accordance with

appropriate NIOSH methods. All PBZ measurements were compared to their respective occupational exposure limits. No respiratory protection was worn by any worker in any of the airports studied. Only 2 of the 72 (3%) DPM samples exceeded 20 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), (the former ACGIH exposure limit and the current California limit for DPM). Average DPM values ranged from 6–14 $\mu\text{g}/\text{m}^3$. Average CO levels ranged from 0.6 to 5.3 parts per million (ppm), well below the NIOSH Recommended Exposure Limit of 35 ppm. Samples collected for other substances of interest ranged from very low to nondetectable. Exhaust emission testing on tugs at two airports found high levels of hydrocarbons and CO, which was related to poor maintenance.

258

NOISE EXPOSURE ASSESSMENT OF AIRPORT SCREENERS DURING CHECKED BAGGAGE SCREENING.

L. Delaney, NIOSH, Atlanta, GA; R. Tubbs, M. Methner, NIOSH, Cincinnati, OH.

Background. Beginning in 2003, Transportation Security Administration (TSA) employees began inspecting all airline passengers and property for explosives and incendiaries. Most checked passenger bags are screened in the ramp area of the airports in areas previous not occupied by employees for a full eight-hour shift. A series of conveyor belts deliver bags to the various baggage areas where TSA employees manually load them onto a conveyor that routes each bag through an Explosive Detection System. After examination, airline personnel transfer the bags to carts attached to tugs for delivery to the aircraft. TSA employees and management were concerned about exposures to high noise levels generated from tugs, jets, conveyor belts, and baggage carousels in the checked baggage screening area. **Methods.** Four airports were selected for inclusion in the study based on size, location of screening areas, and baggage screening volume. Full-shift personal noise monitoring was conducted in the areas of concern and area noise measurements were collected to characterize the noise source. **Findings and Conclusions.** Of the 56 personal full-shift samples for noise, none exceeded the Occupational Safety and Health Administration's Permissible Exposure Limit. There were 12 instances where the 8-hr TWA exposures exceeded the National Institute for Occupational Safety and Health criterion. Generally, the noise exposures to which TSA employees were subjected during their work activities did not pose a risk for occupational noise-induced hearing loss. Major noise sources identified were the ventilation system, aircraft, airline tugs and carts, and the movement of luggage from conveyors onto the screening machines and from the machines to tables for additional inspection, or onto the airlines' conveyors for delivery to the aircraft. Recommendations to further reduce noise levels were provided to attempt to help improve communication between employees.

259

DETERMINING SOUND ATTENUATION CHARACTERISTICS OF HPDS EXPOSED TO IMPULSE NOISE. D. Carpenter, P. Parrish, D. DeCamp, S. Purdy, I. Rycbczynski, R. Shumate, A. Wells, AFIOH, San Antonio, TX.

Impulse noise presents unique problems for hearing protection use. Current hearing protective devices (HPDs) are typically assigned an attenuation rating (Noise Reduction Rating or NRR) for use in determining the attenuation characteristics with continuous noise levels. Regulatory guidance has identified impulse levels that are considered to be hazardous. However, there are no established attenuation values (NRR) for HPDs tested against an impulse noise stimulus and no defined method for the selection of appropriate HPDs for a given impulse noise level.

This study utilized an acoustic manikin (B&K Type 4128C) to measure the attenuation values of various HPDs, including earmuffs and earplugs. The manikin was exposed to controlled presentations of impulse noise in an outside environment. The HPD attenuation levels were determined by measuring the differences in sound pressure levels (SPLs) at the manikin's eardrum microphone with and without the HPDs in place. The SPLs were captured and analyzed by use of a high-speed data acquisition board utilizing software that simulates a digital storage oscilloscope, producing "snapshots" of the noise pulses. The results of this study characterized the manufacturer reported NRR of various HPDs to continuous and impulse noise.

260

ASSESSING HEALTH AND SAFETY OF HEALTH CARE WORKERS—EVALUATION OF SURVEY METHODS IN A REGIONAL MEDICAL CENTER.

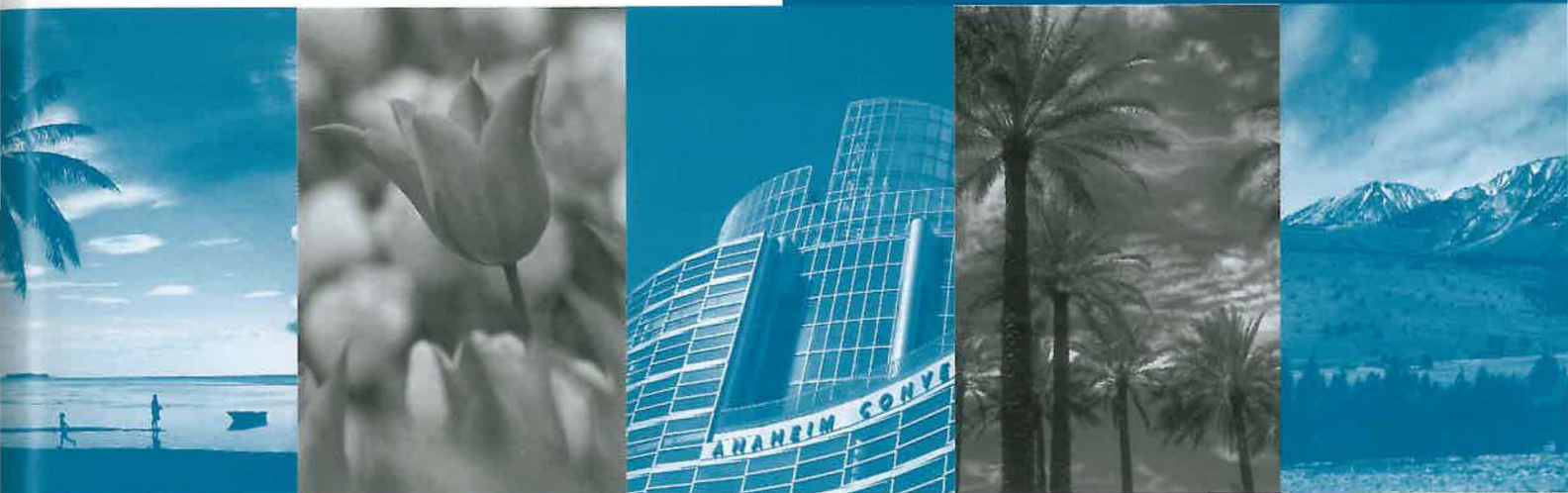
G. Piacitelli, J. Boiano, K. Sieber, NIOSH, Cincinnati, OH; J. Catalano, N. Heyer, B. Payn, Battelle, Seattle, WA.

The National Exposures at Work Survey is intended to collect descriptive data from employees regarding occupational health and safety practices and perceptions, potential exposures, and interventions. The feasibility of collecting this information within the health care industry using a self-administered employee questionnaire was evaluated in a medical center. The questionnaire consisted of a core module addressing general issues (e.g., violence, stress, sharps) and 10 hazard-specific modules (e.g., hazardous drugs, anesthetic gases, sterilants). The questionnaire could be completed using either a multimodule paper version or a seamless web-based version. Approximately 750 employees were divided into three groups. "Targeted" employees (Group 1, n = 295), determined *a priori* to have potential exposure to targeted hazards (e.g., oncology nurses to hazardous drugs), received a letter with a core module and one or more hazard modules in

Abstract Book AIHce

May 21-26, 2005
Anaheim, California

Celebrating Innovation



Co-sponsored by AIHA and ACGIH®



The Premier Conference and Exposition for Occupational
and Environmental Health and Safety Professionals

www.aiha.org/aihce.htm