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MIHS PRESIDENT'S MESSAGE

Professionals preparing for the future

Prepare your silken coat before it rains, and don't wait until you are thirsty to dig a well. - *Chinese proverb.*

Domestic Preparedness. Emergency Action Planning. Interoperability. Regional Response Team Networks. These are the catch phrases for today's work environment, post 9-11.

As local, state and federal agencies focus their efforts on improving interagency communications and preparedness planning for possible terrorist events or natural disasters; so too must all career professionals consider what these new workplace paradigms mean to the continued practice of the art of Industrial Hygiene and Occupational Safety.

The last year has proven to be truly challenging to many safety and health professionals through the United States. Some industries, such as the commercial airlines, have seen bankruptcies and wholesale downsizing in all their positions. Entire sectors of the our economy, such as the Automotive and Chemical Manufacturing, have seen their first significant business downturn in nearly a decade. Reduced tax revenues have had the double-edged effect of reducing employment numbers in the government sector while expanding the number of programs that government agencies have undertaken in an effort to better prepare for future assaults on the America and our economy.

As industrial hygienists and safety professionals, we too need to consider our preparation for unexpected changes within our career paths. We must continue to develop our personal and professional skills through what means are available to ensure our value in many workplace settings. We must recognize that our career planning of just a year ago may be significantly altered due to changes within our regional and national economy. Each of us must ask ourselves the question, "What values do I contribute to the organization which employs me?" and "What service or value can I add to my organization beyond that which I am currently employed?" Each professional must recognize that there are many organizations throughout the local or regional economy that have similar needs for services to that which we currently provide. All professionals need to maintain a sense of who else is providing these services and value? How are they employed? Where does their work take them? Are there increasing opportunities to provide these services in other organizations? What are the "Key Values" which are in demand or are developing into areas of new practice?

As your local section for the American Industrial Hygiene Association, the Michigan Industrial Hygiene Society (MIHS)

has placed significant effort this year in maximizing the benefits of participation to our members. As membership fees have continued to increase for AIHA, MIHS has held our fees at very reasonable levels while dramatically increasing the communications between our members via electronic messaging and our website. We have simplified your participation through online meeting registration and online payment. Our meetings and conferences have been professional, timely and have provided the most current technical information. Our joint meetings have provided exposure to other professionals such as safety engineers, occupational health physicians, community health practitioners, attorneys, toxicologists, and radiation health physicists.

As we close out our first 12 months, post 9-11, let us each consider how to prepare ourselves to be better positioned within our professional community. Consider taking advantage of the many opportunities MIHS offers each member to earn CM points locally, at lower cost to our employing organizations and at greater convenience to our families. For those members who aren't concerned about continuing maintenance of their certification, expect to learn a lot about what the key current issues are to local professionals.

Reinvigorate your participation in our organization - TODAY! Expect more opportunities to be better acquainted with other professionals working within our region or within your industry of expertise. Volunteer for the program committee and offer input on topics of interest to you and realize the recognition of your peers for presenting interesting topics and insightful meetings. Offer input in person or by email. Be active. Plan on participating. Plan on enjoying again your professional practice and the company of your peers.

Please consider how you can impact the growth not only of your own knowledge, but that of our local professional community. You are what makes the MIHS such a wonderful organization to belong to and participate in. Please share yourself with us over the next 12 months.

I wish each of you a Safe and Happy Holiday Season and look forward to seeing you all in early 2003.

Happy Holidays!

Timothy Kearney
MIHS President

Technical Article Review

by Andrew Berryman, MIHS Board

Recently, I had an opportunity to read the Technical Exchange article in the September 2002 edition of *The Synergist*, entitled, "Reducing Employees' Exposure to Carbon Monoxide." This article, written by Robert Weatherly (industrial hygienist with Weyerhaeuser Co.), outlines a containerboard production facility's recognition, evaluation and control of carbon monoxide exposure, within the shipping department. While the focal point of this article was the identification and implementation of an effective emissions-control system for LP gas-fueled forklifts, I have concluded that the company failed to anticipate excessive carbon monoxide exposure, through the periodic review of control methods. Several factors may have contributed to elevated concentrations of carbon monoxide, including an increase in overall production, poor forklift maintenance programs, seasonal changes, or ineffective dilution ventilation.

As industrial hygienists, we are charged not only with controlling occupational exposures to hazardous materials or physical agents, but also with periodically reviewing the effectiveness of the controls we implement. The containerboard company eventually succeeded by

communicating with the occupational nurse, evaluating the exposure and implementing effective, engineering controls. However, they may have failed to anticipate elevated levels of carbon monoxide, by failing to consider the effects of increased forklift traffic, use of forklifts during winter months, or by determining the overall effectiveness of their dilution ventilation controls. For example, additional buildings or structures may have been constructed adjacent to the production facility, thus, reducing ambient winds and the amount of dilution ventilation.

Had the containerboard company anticipated the elevated concentration of carbon monoxide, effective control methods, such as the forklift emissions-control system, could have been implemented sooner. This would have prevented the adverse health effects experienced by the shipping department employees. No action was taken to evaluate the effectiveness of plant ventilation until the occupational nurse began to notice a pattern of headaches. Anticipation, or acting in advance so as to prevent, must be a fundamental component of every company's occupational health and safety program.

Reducing Employees' Exposure to Carbon Monoxide

By Robert Weatherly



A recent problem with CO exposures led to some creative thinking. Robert Weatherly shares

- Steps taken to find the source of the CO problem
- Various control measures adopted
- Encouraging results from an emissions-control system

Indoor air quality issues are receiving increasing attention from the media, as well as the scientific community. Today's workers

are more aware than ever of indoor air contamination issues and of the health effects these contaminants may produce. Management's job of providing an acceptable indoor environment for workers is increasingly complex.

One of the most common of these indoor air contaminants is carbon monoxide, a gas that has no warning properties. Incomplete combustion of hydrocarbons is the usual means by which carbon monoxide is produced. CO has an extremely high affinity for hemoglobin and will reduce the blood's ability to carry oxygen, proportional to the amount of CO in breathing air. Symptoms of CO exposure can include headache, sleepiness, fatigue and central nervous system effects. The OSHA standard for CO exposure in industrial environments is 50 ppm, eight-hour time-weighted average. The ACGIH standard is only 25 ppm, eight-hour TWA.

LP gas (propane) fired engines are very common in manufacturing plants, particularly in forklifts. Poorly-tuned LPG engines may produce 10 percent or more carbon monoxide in the exhaust.

Well-maintained LPG engines can be expected to produce 0.3-1.0 percent carbon monoxide at the tailpipe, so even clean-running LPG engines can produce a CO exposure problem, particularly for the driver.

An Exposure Problem

At Weyerhaeuser's Pine Hill, Ala., operations, an experience with elevated exposure to carbon monoxide in the shipping warehouse led us to a search for solutions, in which several remedies were tried until exposure was reduced dramatically. The Pine Hill operation produces more than 800,000 tons of containerboard each year. LP gas-fueled lift trucks are used in the shipping warehouse to transport and load large rolls of paper for shipment to our customers. Four lift trucks operate simultaneously, 24 hours a day, in our 90,000 square foot shipping warehouse. Ventilation in the warehouse is provided by ambient winds, through louvered panels on the sides of the building and from roll-up doors at the ends of the building. The doors are frequently closed during cold weather.

Several years ago, the plant occupational nurse began to notice a pattern of headaches and other symptoms from employees in the shipping department. This writer measured CO exposures of the lift truck drivers using NIOSH method 6604. This method uses a calibrated electrochemical monitor with datalogger, which records the instantaneous reading once per minute. These immediate readings are used to produce time-weighted averages and short-term exposures, and the monitor will produce graphs of gas measurements over time. The exposure monitoring results quickly showed that carbon monoxide was the likely source of the employee complaints, as some exposures exceeded the OSHA standard, and many exposures exceeded the lower ACGIH standard. Mill management began looking for ways to reduce the exposures, and one of the first reactions was the installation of large fans in the gables of the building. While a logical move, this turned out to be only minimally effective at reducing the CO exposure of the drivers. The reason for the small return on investment is that the lift truck drivers are constantly moving rolls of paper from the well-ventilated warehouse floor into railcars and trailers for transport. It is not feasible to increase air movement inside the railcars and trailers, and so these areas remain enriched in CO. This movement into the poorly ventilated areas accounts for the CO peaks seen on the datalogger graph (Figure 1).

Following the disappointing results obtained using ventilation to lower the CO exposures, other measures were tried. All of the lift trucks received a tune-up, under the guidance of a factory representative. We also used a commercially available propane fuel additive, which contains oxidizers and emulsifiers that make the engine run more efficiently. We were able to make some gains using these methods, but management had set a goal of lowering the exposure numbers to consistently below 25 ppm, and this target was not being achieved.

Encouraging Results

Our lift truck supplier subsequently recommended that we try using a tailpipe emission control system, which is a catalytic converter commercially sold under the name Terminox®. The Terminox manufacturer claims this three-way closed loop emission control system will reduce fuel consumption, as well as provide huge reductions in the emissions of carbon

monoxide, hydrocarbons and oxides of nitrogen. We ordered our first kit in June 1999, at a cost of \$1,000. Our mill maintenance department installed it with guidance from the equipment supplier. We obtained several "before installation" carbon monoxide exposure numbers, then obtained "after installation" numbers for the driver of the same lift truck. Figure 2 shows that the improvement in carbon monoxide TWA exposure is fairly dramatic, from 25.9 ppm before installation to 6.6 ppm after.

With these very encouraging results in hand, management decided that all lift trucks used in the shipping warehouse would be equipped with emission control systems. We completed an agreement with our equipment supplier to lease lift trucks fitted with the Terminox system.

We are now nearing three years into this program, and almost all of the lift trucks are now equipped with Terminox. The system has reduced the carbon monoxide exposure of the drivers by more than 80 percent. Average CO exposure before was 27.5 ppm; it is now 5.1 ppm. There have been no maintenance or other reliability issues with the system, nor is the operation of the truck impaired in any way. Service life of the system was expected to exceed 6,000 service hours, but there has not yet been a failure.

Employees in the shipping department seemed to appreciate the fact that management was concerned about their working environment, as shown by the amount of work that went into solving this problem. And the project was a good fit with Weyerhaeuser's principle of "Safe From the Start"-design safety into the production process whenever possible.

Weatherly is an industrial hygienist with Weyerhaeuser Co., Pine Hill, Ala.

This article was from the September 2002 edition of The Synergist, and was reprinted with the permission of AIHA.

Figure 1

**Clamp Truck #70 - Driver Personal Sample Before Terminox Installation
TWA = 25.9 ppm 8/5/99**

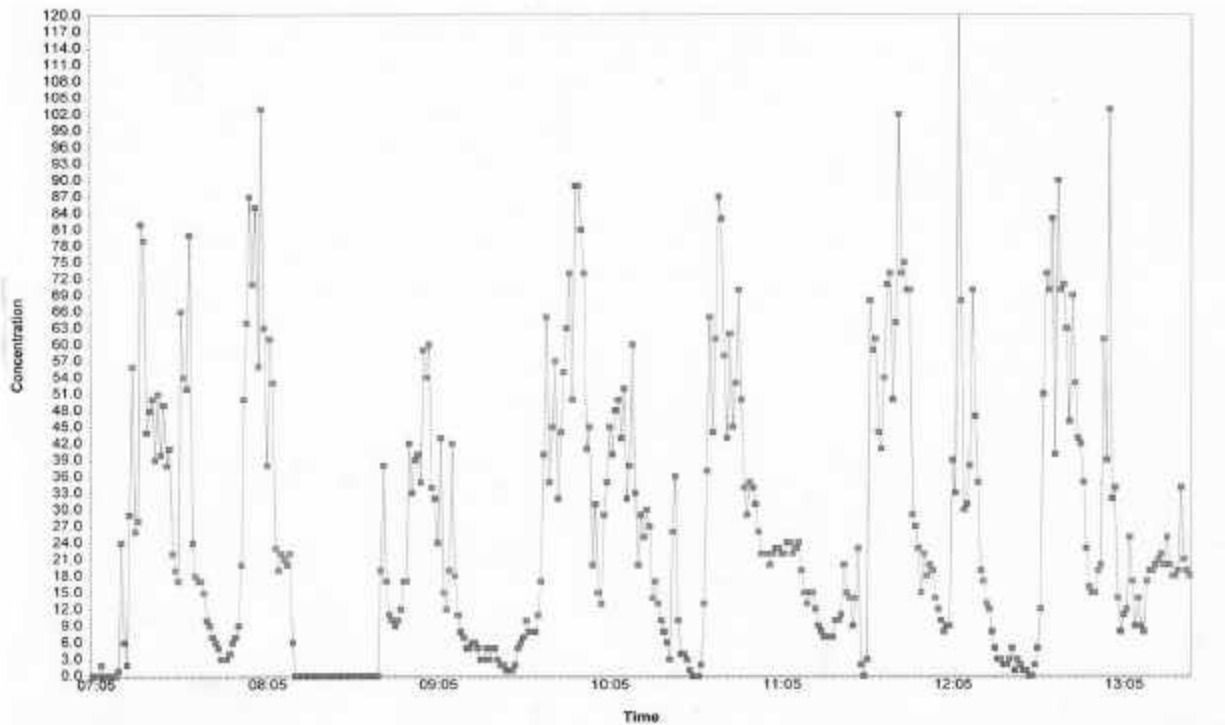
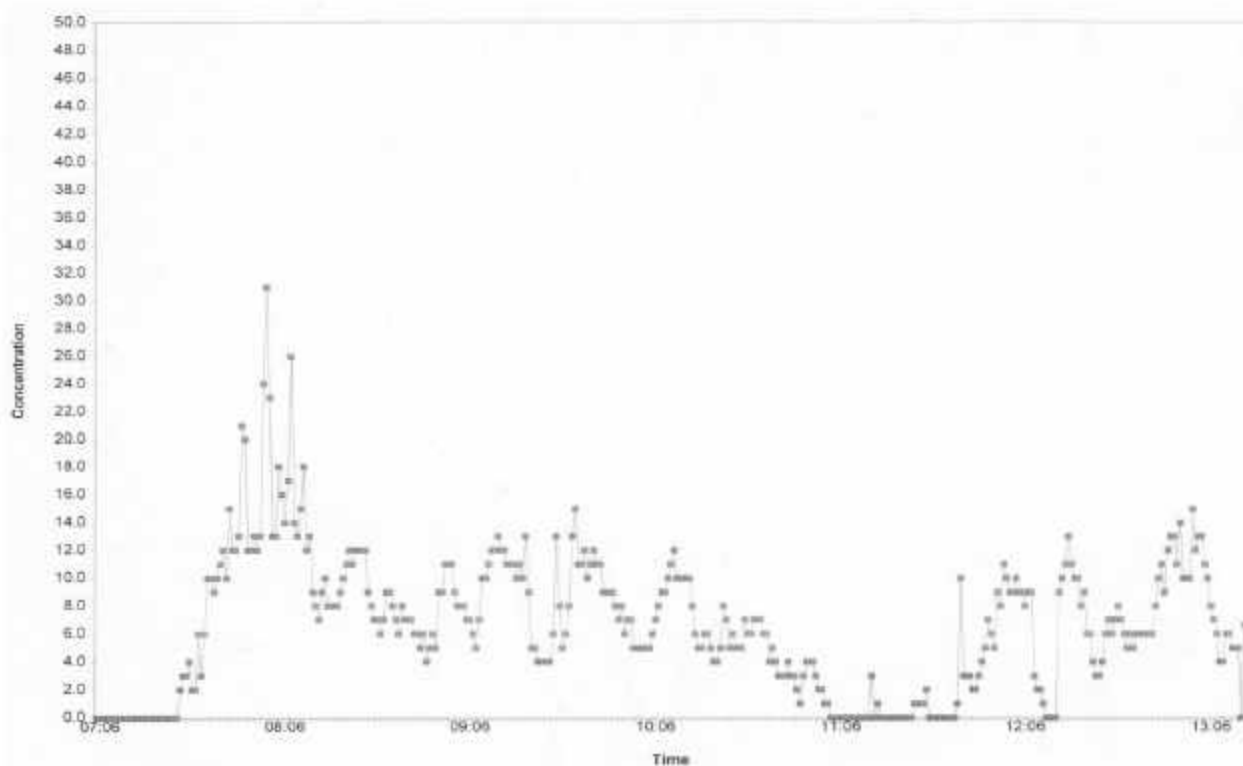


Figure 2

**Clamp Truck #70 - Driver Personal Sample After Terminox Installation
TWA = 6.6 ppm 10/1/99**



V I S I T O U R W E B S I T E . . .

Please visit our website www.MIHSweb.org to view the Event Calendar so your can mark your calendar for upcoming meetings. Click on Event News to see how successful our previous meetings were. Click on the Matching Grants side bar link to find out how you can contribute to the Matching Grants to Universities Program. We hope you find the website a useful resource!



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