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UPDATE

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The Newsletter of the Council for Accreditation in Occupational Hearing Conservation

Prevention Through Design

J. Adin Mann, III, PhD

Prevention through Design (PtD) is a new initiative that was developed in July 2007 at a workshop in Washington DC convened by the National Institute for Occupational Safety and Health (NIOSH). PtD is based on the philosophy that the most effective way to prevent and control occupational injuries, illnesses, and fatalities is to design equipment and processes that eliminate dangers. The workshop included professionals from the hearing conservation industry, insurance, academics, and government covering seven economic sectors and featured presentations by industry leaders in implementing PtD. Topics included practice, examples, and developing a business case for PtD within large corporations.

The meeting had structured discussions in four functional areas: Research, Education, Practice, and Policy. The discussions and recommendations were published in the Journal of Safety Research (2008) and are available on the NIOSH website. http://www.cdc.gov/niosh/topics/ptd

The report from the education group pertains to the CAOHC mission. The strategy described includes education for workers at the front line all the way to executives making business decisions in both large companies and small businesses. The following ideas are presented to inspire ideas for your own work. We hope that you will share ideas on how CAOHC can further fulfill our and your educational missions.

PtD Education Overview

Education, per the PtD program, focuses on all constituents needed to make PtD successful. The constituents vary by economy sector and the education requirements vary for the constituents within each sector. Therefore, an education strategy is developed with an overall approach and a set of resources which is then tailored to the sector. Particular concern is placed on developing effective education strategies for executives, communities, and small business owners. The discussion is divided into several key themes.

Classify Education Action

At the stage of designing an educational action, it is critical to first establish if the goal of an activity is to create capability or awareness.

Capability includes:

- Engineers using tools to apply PtD in the early stages of design
- Nurses and engineers knowing how to effectively communicate each other's ideas
- Safety officers being able to develop the business case for safety
- Small machine shop owners being able to assess the business cases for purchasing old equipment without proper safety guards or purchasing more expensive equipment with all the recommended safety features

Awareness includes:

- CEO's knowing that there is a business case for safety and setting an expectation that safety will always be evaluated
- Engineers knowing that they need to communicate with people using products in order to understand safety and gather potential solutions
- If, for example, there is a safety certification created for home repair companies, that consumers know to look for the certificate
- Prospective employees understanding the risk of taking a job in a business that has not met minimum safety requirements on equipment

Educate the Whole Product or Process Team

All contributors to the design of a product or process need to be schooled in PtD concepts. PtD educational programs should be developed to include those involved in implementing the process or as end users of the product. For example, construction company owners and financiers need to be educated in PtD concepts. Likewise, in the health care setting, a wide range of hospital personnel, including physicians, nurses, administrative, and housekeeping, should be represented in the design process and trained in the principles of PtD.

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CAOHC®

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Payment must accompany request:

555 E. Wells Street / Suite 1100
Milwaukee, WI 53202-3823
Phone (414) 276-5338
Fax (414) 276-2146
E-mail: info@caohc.org

- ***Editor and Publications Committee Chair***
  Ted K. Madison, MA CCC-A
- ***Committee Members***
  Robert D. Bruce, PE, INCE. Bd. Cert.
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Chair's Message

By Mary M. McDaniel, AuD CCC-A CPS/A

In the last issue of Update, I described what I like to call "the synergistic seven". I said that without the implementation of all the elements of a hearing conservation program, the best you could hope for would be compliance, not effectiveness. I sincerely believe that! For a Hearing Loss Prevention Program (HLLP) to actually do what it says, you must:

- measure the noise and control it, if feasible
- monitor workers' hearing
- provide hearing protectors and enforce proper use
- train the exposed worker, and
- maintain records of the program

Along with these requirements, program evaluation will help move you from a compliant program to an effective program.

That being said, I'm now in a position to opine that what I've been preaching for all these years is, very likely, the *wrong* approach. Recently I've spent a good deal of time preparing and delivering management and employee training sessions. This is where it's at, folks! This is where we can all make a difference. As our respected colleague and friend, Don Gasaway, used to say, "to prevent noise-induced hearing loss - aim between the ears".

As you read this edition of *Update*, we are celebrating the 26th anniversary of the OSHA Hearing Conservation Amendment. We've lived and worked with this regulation for lo these many years and, *still* ,we're fighting the noise-induced hearing loss battle.

What's wrong with this picture? We've been assessing noise. We've done millions of hearing tests. The HPD manufacturers keep giving us new and improved products and assessment tools. Don't get me started on the hoops we're jumping through to keep records! Yet, we continue to document hearing loss deemed to be "work-related". **With all the money and effort going into hearing loss prevention, why aren't incidence rates dropping?**

I've started to add a new "focus" in all of the training programs I deliver. I tell them, "OSHA can't protect your hearing. NIOSH can't protect your hearing, WISHA (in Washington we have a state OSHA program) can't protect your hearing, your manager/supervisor/foreman/lead can't protect your hearing, I can't protect your hearing. What we can do is provide you with the information, motivation, rationale, tools, and encouragement to protect your own hearing. **Hearing loss prevention is a personal, lifelong commitment!"** This I believe with all my heart. And this is the only way we will ultimately succeed.

The other elements of the HLPP are important and play a vital role. However, these elements will work only if the individual recognizes the importance of preserving and protecting his/her most precious sense of hearing.

The value of being a CAOHC Certified Occupational Hearing Conservationist is the breadth of your training. You were not merely taught how to operate an audiometer or fit an earplug. You were provided valuable supporting information, making you qualified to speak about the importance of the compliance issues but, more importantly giving you a degree of passion about hearing loss prevention. Make it your goal to motivate the people you work with to:

- respect and treasure their hearing;
- not 'give their hearing away' to noise;
- follow the tenets of their company's program – not from a compliance stand point, but rather from a quality of life focus.

You have the tools, skills, and ability to impact a person's existence. My goal for the next 26 years is to inspire people to value their hearing and to take care of it. CAOHC has prepared you to have a similar goal. I hope you'll accept the challenge and remember….CAOHC, there is no equal.

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Executive Education

During the NIOSH PtD workshop, several speakers from large corporations described how PtD principles were implemented throughout a company once the company leadership understood PtD and the positive impact PtD has on business profit. The challenge is reaching these company leaders to educate them about PtD. One example is a CEO education model in Ontario, Canada, called the "CEO Health & Safety Charter." It was reported that meetings have been attended by CEOs from roughly 200 companies.

Other approaches should be pursued such as printing articles in trade journals and business-oriented publications such as the Wall Street Journal, which are read by company executives. Newsletters from MBA programs can also provide unique access to company leaders. Such articles should focus on successes of PtD approaches and should be written from executives' perspective and in language that will appeal to them.

Secondary and Post-Secondary Education

Within secondary and graduate education, the disciplines of engineering, architecture, and business most frequently are identified for PtD education. In the business field, PtD could be linked to such course content as corporate social responsibility to connect PtD to other matters of corporate good citizenship. Many other fields, including health care, hotel and restaurant management, industrial technology, and food science, are examples of additional targets for PtD educational efforts. Where possible, PtD concepts should be tied to other design concerns such as sustainability and environmental issues.

Continuing Education

Continuing education is being considered as formal education provided to people who are no longer full-time undergraduate or graduate students. The training may lead to post-secondary degrees or certificates or may be needed for maintenance of existing certification or licensure. Course work for continuing education could be the best opportunity for multi-disciplinary approaches to PtD.

One idea for a non-traditional distance course is in the area of health care where it has been stated that engineers need to better understand how health equipment is used and nurses need to better understand what engineers can do in the design stage and how to effectively communicate their ideas. A training program could provide opportunities for engineers to shadow nurses in their hospital work so that the engineers see first hand how equipment is used and also provide opportunities for nurses to be better aware of the type of design alternatives that engineers could develop and to learn how to effectively communicate their ideas to engineers.

Community Education

The community is one of the potential drivers for PtD being implemented by small businesses and in consumer products. For example, if people in the community knew about PtD, they could ask contractors performing work the correct questions to be sure that safety principles would be considered in the work to be done. In this way, people could assess the PtD qualifications of the contractor.

It is recommended that a rating system for PtD be developed for products and processes that an individual or small group in a community would be concerned with. Such a rating system could be modeled after the Carolina STAR program. The PtD rating system would need to be accompanied with a community level education program and a means for small business to be trained on the rating system.

Small Business

Addressing small businesses is likely to be a challenge with no easy solutions. In comparison to small businesses, large and mid-size companies can use a smaller percentage of total resources to focus on education and implementation of PtD. For example, it may be exceedingly difficult for the owner of a three-person machine shop to attend a weeklong PtD training course, never mind expecting the employees to also attend.

While required PtD certification or compliance is one of the drivers for small businesses to become educated in and to implement PtD, there are non-mandatory training programs that have been successful at attracting small business owners, such as safety education efforts in Ontario, Canada.

Resource Development

A critical component of creating an educational foundation for PtD is to develop and maintain a database of resources for PtD education. The database would include lecture modules, case studies, and lesson plans that can be used at both the secondary and continuing education levels. The content should be tailored for courses ranging, for example, from engineering, to architecture, to business, and to the service sector. Educational materials should be "turn-key" and easy to integrate into existing courses.

Drivers for Education Change

Education is currently taking place at many levels of every economy sector. Education is either mandatory to gain entrance to the job market, advance in the job market, or to maintain access to a job market. In professions and trades where continuing education is considered essential to obtaining and maintaining a license or certification, the credentialing organizations can drive PtD education by requiring some portion of the training to include PtD concepts. For example, the engineering license could contain PtD content, which would drive individuals to learn PtD and generate a greater need for PtD training.

At universities, change can be generated from the top down, but often more permanent changes are generated from the faculty. One of the strongest agents for quick change is an alumnus who is a CEO of a large corporation. Companies, through their hiring, represent key change agents if they make it clear that specific material is making some students more attractive for internship or permanent hiring. If this happens, then many university faculties will include the material in their curriculum. An example is the current demand driven changes in MBA programs throughout the country to include more course work on social responsibility.

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OHC Corner

OHNs Make Great OHCs!

Diane S. DeGaetano, RN BSN COHN-S COHC

Did you know that over 50% of all occupational hearing conservationists (OHCs) are occupational health nurses (OHNs)? CAOHC is supported by the American Association of Occupational Health Nurses (AAOHN), the professional occupational nursing organization. I am proud to be one of two members of AAOHN with expertise in hearing conservation who serve on the CAOHC Council. The other is Madeleine Kerr, Ph.D. RN, associate professor at the University of Minnesota School of Nursing. The experience and participation of AAOHN members helps to further the mission of CAOHC, "to promote the conservation of hearing by enhancing the quality of occupational hearing conservation programs."

The main goal of an OHC/OHN is to contribute to the prevention of occupational hearing loss by implementing hearing conservation best practices, such as those developed by CAOHC and the National Institute for Occupational Safety and Health (NIOSH). Education and training of noise-exposed workers are key components of the hearing conservation program (HCP) and the OHC/OHN often plays an important role. Not only must the OHC/OHN teach employees about hearing conservation, they must also motivate them to believe that hearing is valuable and take action to protect it.

It is essential for the OHC/OHN is to be visible to employees. One method of accomplishing this is to conduct walk-though audits of noisy areas on a routine basis. OSHA lists three items in its compliance audit that are related to noise:

- Hearing protection signs are displayed where appropriate in all areas of the plant where noise levels exceed 85 dBA
- Employees are trained and educated in the use of noise control measures
- Hearing protection equipment is provided and used as needed by EVERYONE

Whenever an employee reports a complaint involving hearing conservation in an area, the OHC/OHN should visit the area soon afterward. During the walk-through of the area, the OHC/OHN can use the NIOSH hearing conservation checklist to evaluate how well the program is being implemented. By investing the time and energy to evaluate the issue in a particular work area, and responding to the employees' concerns, the OHC/OHN builds trust and confidence of the employees. Follow-up with the employee and the supervisor is critical for continuing an effective hearing conservation program.

Another way to add credibility to a program is to include others as members of the hearing conservation team such as, people from human resources, safety, employee groups, industrial hygiene, occupational medicine, maintenance, and manufacturing. The OHN should also work closely with the audiologist or physician who serves as their professional supervisor (PS) for the audiometric component of the HCP. When the OHN and the PS work as a team, with clearly defined expectations, policies, & procedures, the potential for success is enhanced.

Most OHCs working in an occupational health clinic are considered "trust-worthy." Employees usually feel more comfortable sharing concerns with the "company nurse," than with their supervisor, manager, or even co-workers. An open-door environment can be used to complete on-the-spot training, a value-added activity. Even though employees may visit the clinic to discuss a personal health issue, the nurse may ask if hearing protection is being used or some personal question about the employee's health, such as, "are you over the sinus infection which delayed your annual audiogram?"

The concept of credentialing is well-respected within the occupational health community; AAOHN encourages certification in hearing conservation, spirometry, case management and safety management. Nurses can become a certified occupational health nurse (COHN) or a certified occupational health nurse specialist (COHN-S). CAOHC provides workshops leading to certification of course directors (CDs), who then develop and offer courses for OHNs and others wishing to become certified OHCs. In addition, CAOHC offers seminars and specialty recognition for audiologists and physicians who work as a professional supervisor in a HCP.

The CAOHC website offers interactive teaching tools, listings of approved OHC, PS and CD courses as well as the criteria for each certification. Visitors to the CAOHC website can also purchase copies of the Hearing Conservation Manual, written by Alice Suter, Ph.D., one of the most highly regarded experts in the field.

Becoming a certified OHC is one of the best ways for the OHN to demonstrate the value s/he brings to the employer and the employees who are most effected by workplace noise.

Online Resources

http://www.caohc.org

http://www.deltaenvironmental.com.au/management/Environment_safety/OH_S_audit_form.htm

http://www.cdc.gov/niosh/topics/noise/solutions/ hearingchecklist.html

Diane S. DeGaetano, a certified Occupational Health Nurse – Employed with Merial, Limited (International Animal Health Company, headquartered in Duluth, Georgia), as the Occupational Health Manager for North America.

Assessing a Non-Standard Day

Peter Zymanczyk, London Fire Brigade

Measuring and assessing the noise exposure of workers in some industries, such as construction and firefighting, is not as straightforward as in a factory. The difficulty in assessing noise exposure in these circumstances will be examined using the Fire and Rescue Services (FRS) as a case study. The requirement for a swift response to an emergency call means there is no 'standard' work day in this industry in spite of structured shift patterns, programmed routines, and planned tasks such as training and fire prevention duties. This makes it difficult to explain incidents of noise induced hearing loss (NIHL) that appear to be work-related in the absence of data supporting overexposure to noise on the job.

Background

Extensive studies over more than 20 years in the USA, most notably those published by R. L. Tubbs and S. N. Kales, have identified that firefighters had better hearing than the general population at the time they were recruited but, towards the end of their careers, the hearing of the firefighters was consistently poorer than that of a non-fire fighting population of a similar age. The results of numerous investigations into this dramatic hearing loss were puzzling, as the measured daily exposure levels were within, and in many cases below, the occupational hygiene recommendations for noise. Further investigations into the lifestyle and off-duty activities of firefighters did identify a number of noisy activities but they were neither consistent across the group nor done for extended periods of time. The hearing loss within the firefighter population was relatively consistent (estimates ranging from ½ dB per year of service to 5 dB in six years of service) and the only conclusion that could be reached was that the hearing loss was occupationally related.

A more recent, and contrary, study (Clark and Bohl, 2005) suggested that firefighters were not at risk of occupational NIHL and commented that, generally, they had robust hearing. However, both fire departments involved in this study had well established hearing conservation programmes, which suggests that even in industries where there is an unpredictable exposure to noise, hearing can be protected.

These investigations confirm that there may be a problem in assessing the effect of occupational noise exposure in industries where there is no standard working day. In the case of the FRS, Tubbs (1995) suggested three possible mechanisms might be at work:

- Noise exposure at the same time as exposure to chemicals acts synergistically to cause greater-than-anticipated damage to hearing;
- Exposure to higher frequency noise might be more damaging to hearing than anticipated; and
- Long quiet periods at fire stations, disrupted by short periods of very loud noise from sirens and vehicle engines etc., may be more damaging than exposure to constant noise levels.

The possible interaction between noise and chemicals as a factor in firefighter hearing loss is an interesting one. Generally, firefighters are unlikely to be exposed to chemicals occupationally with one possible exception: carbon monoxide—a known ototoxic substance (Prasher et al., 2002). However, the increased use of breathing apparatus over the past 20 years should have reduced exposure to carbon monoxide. Therefore, if CO were a factor in firefighter hearing loss, an overall reduction in NIHL might have been observed over the time of previous studies. Since no such trend has been observed, it seems unlikely that chemical exposures play a significant role in firefighters' NIHL.

The second and third mechanisms suggested by Tubbs (1995) can be found in any environment where the pattern of noise exposure is inconsistent. However, these mechanisms challenge the principle of equal energy; the direct relationship between the sound pressure level (SPL) and exposure duration. If there is evidence to support the suggestion that sudden exposure to high volume and/or high frequency noise might in some way cause a damaging shock to the hearing system, the hearing loss risk faced by firefighters may be significant given that noise exposure patterns found in the FRS are often of that type.

Recent background noise measurements at UK fire stations fell between 45 and 68 dB(A) while personal noise dose meter readings were evenly distributed between 77 and 92 dB(A) before any allowance is made for microphone bumps or knocks. A number of noise sources and tasks were identified during the working day that had a wide variation in both exposure level and duration, including: sirens, automatic fire alarms, casualty extrication tasks, and engines/generators running. Most of these exposures were short, between 5 and 45 minutes, in an otherwise quiet working day. Although these episodes of short duration, very high level noise may make a major contribution to the daily noise exposure, they may be effectively camouflaged when averaged over an extended work period. This is not the first time this has been identified. The American College of Occupational and Environmental Medicine (2002) has commented: "measures to estimate the health effects of such intermittent noise are lacking." In the United Kingdom, the Health and Safety Executive (2000) has suggested that if, "no single day or other period of time can be considered to be representative of noise exposure ... it will be impracticable or of little use to make an accurate measurement of $L_{EP,d}$ for these workers."

Alternative Approaches

There are two possible approaches to assessing noise exposure in these circumstances. The first method requires that noise from all activities is measured and assessed against estimates of duration from attendance data at incidents or actual durations of training activities. From this information, models of different working days/weeks could be constructed to enable an overall assessment of noise exposure. However, irrespective of how well this modelling process is done, there remains wide potential for exposure to noise in ways not

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considered. This being the case, what use is modelling?

The second method is a more pragmatic approach which attempts to account for the potentially disproportional effect that high frequency or short duration noise episodes might have on hearing. Rather than try to assess noise in relation to a reference 8-hour working day, why not assess each activity and its potential contribution towards the total daily noise dose? The idea is to effectively set a maximum contribution any noise source could make to the total daily dose, either by actual measurement or estimate of exposure. When this level is exceeded, action must be taken. However, any limit would need to be reasonably low, bearing in mind Tubbs' view about noise exposure after a long quiet period. An action level of 30% of the daily exposure limit (85 dB L_{Aeq}) is suggested for firefighters.

The daily noise dose corresponding to the exposure level and duration of exposure are shown in Table 1. The first column is the equivalent A-weighted sound level of a noisy activity. The duration of the exposure in hours is shown across the top. Note that a 100% dose in this table is defined as an L_{Aeq} of 85 for 8 hours and the dose doubling rate, often referred to as the exchange rate, is 3 dB. As a result, a 4-hour exposure at 85 dBA results in a noise dose of 50%.

We can use this table to easily identify the action level for limiting the noise dose associated with short, high level noise exposures. The dark shaded values in this table correspond to a noise dose of 30% or more of the daily exposure limit (85 dB L_{Aeq}). Intervention to reduce noise exposure is recommended whenever this action level is reached or exceeded.

Table 1. Noise Dose and Suggested Action Levels for Very High Short Term Noise Exposures *

Sound Level L_{Aeq} (dB)	Duration of exposure (hours)							
	0.25	0.5	1	2	4	8	10	12
105	320	625	1250					
100	100	200	400	800				
97	50	100	200	400	800			
95	32	65	125	250	500	1000		
94	25	50	100	200	400	800		
93	20	40	80	160	320	630		
92	16	32	65	125	250	500	625	
91	12	25	50	100	200	400	500	600
90	10	20	40	80	160	320	400	470
89	8	16	32	65	130	250	310	380
88	6	12	25	50	100	200	250	300
87	5	10	20	40	80	160	200	240
86	4	8	16	32	65	130	160	190
85		6	12	25	50	100	125	150
84		5	10	20	40	80	100	120
83		4	8	16	32	65	80	95
82			6	12	25	50	65	75
81			5	10	20	40	50	60
80			4	8	16	32	40	48
79				6	13	25	32	38
78				5	10	20	25	30
75					5	10	13	15

Action to reduce noise exposure required

Noise exposure broadly tolerable

*Adapted noise exposure ready-reckoner from HSE guidance (2005)
Based on 3 dB dose doubling rate

Table 1 shows that noise exposure between 94 and 95 dB(A) for as little as 15 minutes (such as might be expected during an attendance at a fire alarm actuation) in a working day is likely to require an intervention. On the other hand, intervention is not necessary for a noise exposure between 85 and 86 dB(A) (such as operating a fire pump) until the predicted noise exposure is likely to last for two or more hours. Table 1 also provides a means of ranking hazards: the higher the dose value, the higher the priority. In cases where different hazards generate the same number, the actual/estimated number of exposures (emergency calls in the case of the FRS) to a particular hazard can be used to further determine priority; those occurring most frequently being addressed first.

Table 2 presents a comparison between the suggested action levels in Table 1, which are based on an 85 dBA exposure limit and a 3 dB exchange rate, and the maximum allowable exposure time corresponding to a 30% noise dose using the OSHA 90 dBA exposure limit and 5 dB exchange rate. Intermittent noise exposures longer than those described in Table 2 would exceed the recommended action level of 30% of the daily exposure limit and should trigger intervention.

Table 2. Suggested Action Levels

LAeq	Table 1 Duration (hrs)	OSHA Duration (hrs)
95	.25	1.2
92	.5	1.8
89	1.0	2.8
86	2.0	4.2
83	4.0	6.3

Hearing Protection Considerations

Making an assessment is not the end of the process. The dynamics of the FRS environment adds another dimension; the need to hear what is going on – particularly instructions and/or warnings. Consequently, when considering hearing protection, some method of preserving or enhancing voice communication must be included. Ideally, firefighters would be able to choose devices that can do so without compromising the effective protection; for example, sound restoration hearing protectors. With regard to hearing protector selection, several important questions arise, including:

- Should different types of hearing protection be provided for different situations?
- Is it right to attempt to afford reasonable protection from most noise sources if this leads to a situation where only limited protection is afforded in some circumstances?
- If control measures take the "edge" off noise during actual operations, will rigid enforcement of hearing protection during training activities be enough to prevent permanent hearing damage?

Conclusions

In keeping with many other articles on this topic, there are no immediate answers to these questions. My hope is to stimulate debate about how best to assess the noise exposure of workers who experience inconsistent noise exposures from day-to-day and how to choose hearing protectors that

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BLS Occupational Hearing Loss Report for 2007

Lee D. Hager

The US Bureau of Labor Statistics (BLS) has released summary occupational injury and illness data for 2007. Hearing loss has been a separate category in BLS reporting since 2004 under the OSHA regulation 29CFR1904.10, allowing analysis and tracking separate from other workplace illnesses.

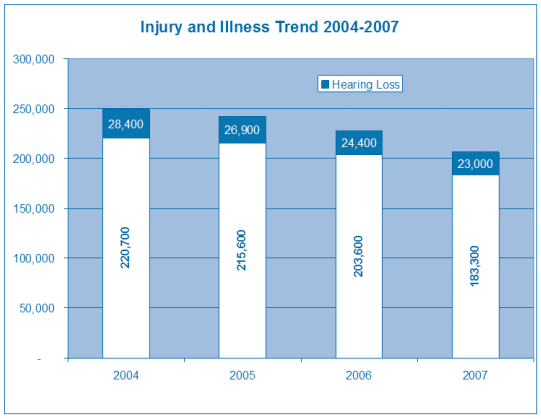
The information provided by BLS is not a direct summary of the OSHA Form 300 reports provided by employers each year. Instead, BLS sends a secondary request to a select group of employers and uses the information obtained from that inquiry to estimate the overall scope of workplace illness and injury in the US. According to BLS, how this sample is constructed has a significant bearing on the projected findings. In 2006, for example, BLS surveyed about 176,000 establishments, representing 0.6% of US employers and 3% of employers who report having employees. According to BLS, "… the sample used is one of many possible samples, each of which could have produced different estimates."

OSHA asks for specific information on four common occupational illnesses: hearing loss, skin disorders, respiratory illnesses, and poisonings. Every illness that does not fall into one of these categories (including cumulative trauma and repetitive strain) is classified as "all other."

BLS data reflect private employers in the US, and do not include workers covered under the Mining Health and Safety Administration (MSHA), Federal Railroad Administration (FRA), or Longshoremen. Health and safety and injury/illness reporting is managed separately for each of these groups.

2007 Results

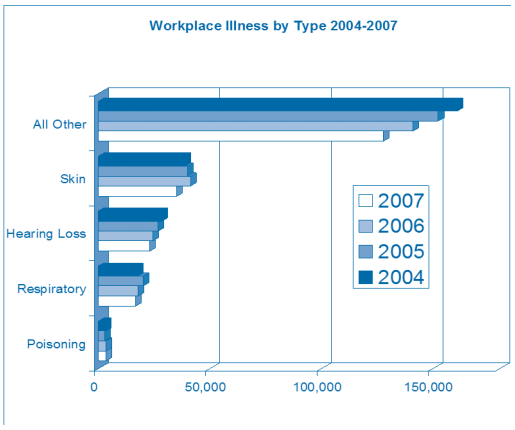
While the overall trend for hearing loss closely matched the reduction in overall illnesses reported, BLS estimated that 23,000 workers were found to have permanent, irreversible hearing impairment on the job in 2007 (fig 1). Hearing loss accounted for about 11% of total illnesses reported, consistent with previous years.



[Figure 1: Occupational Hearing Loss Cases Compared to All Other Workplace Illness Cases from 2004-2007. U.S. Bureau of Labor Statistics]

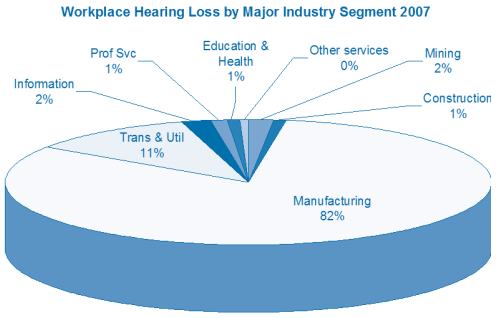
In the four years since OSHA has required separate reporting of hearing loss on Form 300, the hearing of over 100,000 US workers has been permanently impaired on the job. For reference, that is more than the entire population of Erie, Pennsylvania or Green Bay, Wisconsin.

Hearing loss was again the 2nd highest specific reported illness, after skin disorders (fig 2).



[Figure 2: Workplace Illnesses in 2007 by Type. U.S. Bureau of Labor Statistics]

Hearing loss was concentrated in the manufacturing and transportation sector and the utilities sector. Transportation and utilities showed an increase in hearing loss cases of about 4%. Hearing loss cases doubled in mining workers not covered by MSHA, from 200 to 400 cases.



[Figure 3: Occupational Hearing Loss in 2007 by Major Industry Sector. U.S. Bureau of Labor Statistics]

Using the Data

Information in the BLS report is organized by the North American Industry Classification System (NAICS) code. NAICS organizes industries from large view to small view as the number of digits in the code increases from 2 to 3, 4 or 5. For example, NAICS code 11 is Agriculture; 112 is Animal Production; 1121 is Cattle Ranching and Farming; and 11211 is Beef Cattle Ranching. This organizational system allows analysis of information in the depth of detail appropriate for individual users.

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BLS Occupational Hearing… – continued from page 7

Benchmarking of local hearing loss rates and cases to the national summary can be a useful measure of comparative program effectiveness, with the understanding that the source data may be subject to significant sample bias as the groups grow smaller and the NAICS codes more precise.

In addition to injury and illness data, BLS reports include information about average employment per NAICS code which allows for the easy development of prevalence statistics, which may be of more value than the simple count of cases or incidence finding as shown in the table.

NAICS		Hearing Losses	Incidence per 1000	% of total
331	Primary Metal	1,400	3.0	7%
311	Food	3,600	2.4	19%
321	Wood Product	1,200	2.2	6%
313	Textile	400	2.2	2%
336	Transportation Equip	3,400	2.0	18%
322	Paper	900	1.9	5%
332	Fabricated Metal	2,200	1.4	12%
327	Nonmetal mineral	700	1.4	4%
333	Machinery	1,400	1.2	7%
326	Plastics & Rubber	900	1.2	5%
337	Furniture	600	1.1	3%
312	Beverage and Tobacco	200	1.0	1%
323	Printing	600	0.9	3%
324	Petroleum & Coal	100	0.9	1%
335	Electrical	300	0.7	2%
314	Textile Product	100	0.6	1%
339	Misc	300	0.5	2%
315	Apparel	100	0.4	1%
325	Chemical	300	0.3	2%
334	Comp & Electronics	100	0.1	1%
316	Leather		0.0	0%
	Overall	18,800	1.3	

[Figure 4: Occupational Hearing Loss Cases and Incidence Rates in 2007 by NAICS code. U.S. Bureau of Labor Statistics]

The table, for example, reflects total employment and hearing loss cases for the manufacturing sector by 3-digit NAICS code. While the food sector had the highest number of cases, the incidence of hearing loss was greatest in the primary metal sector. Using incidence per 1000 full time equivalent employees rather than comparison of total cases may be a better tool when benchmarking.

Overview injury and illness reports are available from the BLS website at http://www.bls.gov/iif/oshwc/osh/os/ostb1911.pdf; detailed reports by NAICS code are at http://www.bls.gov/iif/oshwc/osh/os/ostb1914.pdf

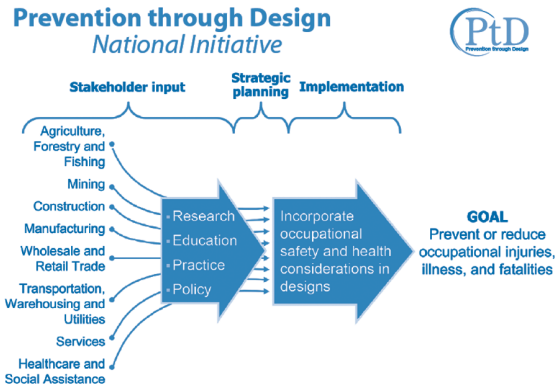
Lee Hager serves as Hearing Loss Prevention Consultant for Sonomax Hearing Healthcare, Inc. He has served as chair of the Noise Committee of the American Industrial Hygiene Association (AIHA), and currently represents AIHA on the Council for Accreditation for Occupational Hearing Conservationists (CAOHC).

Prevention Through Design… – continued from page 3

By educating customers on PtD, the customer can be the driver, seeking out small businesses that practice PtD methodologies. Customer demand has great potential to influence the practices and priorities of small businesses in the areas of construction, remodeling, repair, house maintenance, house cleaning, automotive repair, etc.

Conclusion

NIOSH (2008) has summarized the PtD national initiative this way, "The approach that will be used to develop and implement the PtD National Initiative will be framed by industry sector and within four functional areas: Research, Education, Practice, and Policy. As this diagram indicates, this process encourages stakeholder input through a sector-based approach consistent with the one used under the National Occupational Research Agenda (NORA)."



"The ultimate goal of the PtD Initiative is to prevent or reduce occupational injuries, illnesses, and fatalities through the inclusion of prevention considerations into all designs that impact workers. Along the way, intermediate goals will be identified to provide a path toward achieving the ultimate goal. NIOSH will serve as a catalyst to establish this Initiative, but in the end, the partners and stakeholders must actively participate in addressing these goals to make PtD business-as-usual in the 21st century."

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J. Adin Mann III, PhD, BS, is an Associate Professor and the Director of Graduate Education for Mechanical Engineering, Iowa State University. Dr. Mann's technical specialties are noise and vibration control. Much of Dr. Mann's work focuses on developing predictive models of noise. Current activities include cooling fan noise, control valve and piping noise, and supercharger noise.

Hear for the Future

Communities Urged to "Protect Their Hearing, Protect Their Health" on International Noise Awareness Day, Wednesday, April 29, 2009

"It is time to address the threat that noise poses to hearing, health, learning and behavior," says Amy Boyle, Director of Public Education at the League for the Hard of Hearing. This year the League is once again spearheading a special effort to inform the public of the necessity of creating a quiet home, school and recreational environment.

Continuous exposure to noise above 85 decibels can be harmful to hearing and lead to physiological changes in blood pressure, sleep, digestion and other stress-related disorders. Studies exist documenting the harmful effects of noise on children's learning and behavior. "It is time" Boyle says, "that we take responsibility to quiet our surroundings and create a healthy environment for us and our children."

Among the many activities planned during **International Noise Awareness Day**, Wednesday, April 29, 2009 sponsored by the League for the Hard of Hearing, the public will be asked to observe the Quiet Diet - one minute of quiet, regardless of their location, from 2:15 P.M. to 2:16 P.M.

Other activities planned include:

Free Hearing Screenings - Private audiologists and speech and hearing clinics will help to celebrate International Noise Awareness Day by providing free hearing screenings to the public.

Dissemination of Hearing Protection - Hearing protection will be distributed on International Noise Awareness Day at hearing screenings, town meetings, and various places of business and college campuses.

Town meetings to "Sound Off on Noise" - Town meetings will be scheduled in various communities on International Noise Awareness Day to provide a forum for community residents to voice their concerns about noise. Local police departments, representatives from the Department of Environmental Protection and local politicians will be invited to attend these meetings.

Publicity - Participants in International Noise Awareness Day will hold press conferences in their local areas. Press releases and public service announcements on television and radio stations will involve the media and help to promote the important message that noise hurts.

City/State Proclamations - Mayoral and Gubernatorial Proclamations in celebration of International Noise Awareness Day will be obtained.

Community Outreach - Develop your own anti-noise group and speak out about the harmful effects of noise in your community. Analyze (or develop) your local noise code and follow the Noise Center's steps in handling a noise complaint.

Additional information on International Noise Awareness Day and how you can participate is available at the Noise Center website at www.lhh.org/noise or by contacting Amy Boyle via email at aboyle@lhh.org.

Assessing a Non-Standard Day… – continued from page 6

will adequately reduce the wearer's noise exposure without overly impairing communication and situational awareness. The starting point of which must be that reliance on an 8-hour reference period may, in some circumstances, be contributing to concealing a problem.

Although this paper has addressed the unique patterns of firefighter noise exposures, there may be other jobs where employees are exposed to very high level noise for short periods of time and experience greater hearing loss than might be expected with more steady noise exposures over long periods.

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UPCOMING OHC CERTIFICATION AND *RECERTIFICATION COURSES* 2009

This list is current as of March 1, 2009. New courses are added daily.
Please visit our website for an updated list at www.caohc.org.

Begin Date	State	City	Course Director	Phone
23-Mar-09	KS	Lenexa	Diane L. Bachman, MS CCC-A	913-748-2063
*24-Mar-09	MN	Minneapolis	Ted K. Madison, MA CCC-A	612-625-2443
*24-Mar-09	CA	Sacramento	Kirsten R. McCall, AuD CCC-A	425-254-3833
25-Mar-09	OH	Dayton	Chris M. Pavlakos, PhD	937-436-1161
25-Mar-09	TX	Houston	Johnny L. Sanders, MA CCC-A	800-869-6783
25-Mar-09	TX	Corpus Christi	John H. Elmore, AuD MBA CCC-A	800-357-5759
25-Mar-09	CA	Sacramento	Kirsten R. McCall, AuD CCC-A	425-254-3833
25-Mar-09	PA	Pittsburgh	Roger M. Angelelli, PhD	412-831-0430
*26-Mar-09	TX	Houston	Johnny L. Sanders, MA CCC-A	800-869-6783
*26-Mar-09	TX	Corpus Christi	John H. Elmore, AuD MBA CCC-A	800-357-5759
*27-Mar-09	OH	Dayton	Chris M. Pavlakos, PhD	937-436-1161
*27-Mar-09	PA	Pittsburgh	Roger M. Angelelli, PhD	412-831-0430
01-Apr-09	MA	Mansfeld	Pamela J. Gordon-DuPont, MS CCC-A	860-526-8686
01-Apr-09	NJ	Newark	Johnny L. Sanders, MA CCC-A	800-869-6783
01-Apr-09	OR	Portland	Rodney M. Atack, PhD	503-614-8465
01-Apr-09	PA	Pittsburgh	Timothy A. Swisher, MA CCC-A	412-367-8690
01-Apr-09	GA	Atlanta	Michele Alexander, MS CCC-A	336-834-8775
01-Apr-09	WI	Milwaukee	James J. Jerome, MA CCC-A	317-841-9829
01-Apr-09	AL	Birmingham	Georgia W. Holmes, AuD CCC-A	205-934-7178
*02-Apr-09	MA	Mansfield	Pamela J. Gordon-DuPont, MS CCC-A	860-526-8686
*02-Apr-09	NJ	Newark	Johnny L. Sanders, MA CCC-A	800-869-6783
*02-Apr-09	OR	Portland	Rodney M. Atack, PhD	503-614-8465
*02-Apr-09	PA	Pittsburgh	Timothy A. Swisher, MA CCC-A	412-367-8690
*02-Apr-09	GA	Atlanta	Michele Alexander, MS CCC-A	336-834-8775
*02-Apr-09	WI	Milwaukee	James J. Jerome, MA CCC-A	317-841-9829
*02-Apr-09	AL	Birmingham	Georgia W. Holmes, AuD CCC-A	205-934-7178
08-Apr-09	MA	Auburn	Steven R. Fournier, AuD CPS/A	508-832-8484
08-Apr-09	TX	San Antonio	John H. Elmore, AuD MBA CCC-A	800-357-5759
*09-Apr-09	TX	San Antonio	John H. Elmore, AuD MBA CCC-A	800-357-5759
*09-Apr-09	AL	Birmingham	Georgia W. Holmes, AuD CCC-A	205-934-7178
13-Apr-09	FL	West Palm Beach	Herbert J. Greenberg, PhD CCC-A	678-352-0312
*14-Apr-09	FL	West Palm Beach	Herbert J. Greenberg, PhD CCC-A	678-352-0312
14-Apr-09	CA	Ontario	Kirsten R. McCall, AuD CCC-A	425-254-3833
15-Apr-09	VA	Glen Allen	Thomas H. Cameron, PhD CCC-A CPS/A	919-459-5255
15-Apr-09	TX	Dallas/Ft Worth	John H. Elmore, AuD MBA CCC-A	800-357-5759
*15-Apr-09	CA	Ontario	Kirsten R. McCall, AuD CCC-A	425-254-3833
15-Apr-09	NC	Greensboro	Cheryl S. Nadeau, MEd FAAA	336-834-8775
*16-Apr-09	VA	Glen Allen	Thomas H. Cameron, PhD CCC-A CPS/A	919-459-5255
*16-Apr-09	TX	Dallas/Ft Worth	John H. Elmore, AuD MBA CCC-A	800-357-5759
*16-Apr-09	NC	Greensboro	Cheryl S. Nadeau, MEd FAAA	336-834-8775
22-Apr-09	KY	Owensboro	Joseph E. Etienne, PhD CCC-A	270-926-0418
22-Apr-09	IL	Chicago/ Schaumburg	Thomas D. Thunder, AuD FAAA INCE Bd.Ct.	847-359-1068
*22-Apr-09	IL	Chicago/ Schaumburg	Thomas D. Thunder, AuD FAAA INCE Bd.Ct.	847-359-1068
22-Apr-09	TX	Dallas	Johnny L. Sanders, MA CCC-A	800-869-6783
*22-Apr-09	KY	Owensboro	Joseph E. Etienne, PhD CCC-A	270-926-0418
*23-Apr-09	TX	Dallas	Johnny L. Sanders, MA CCC-A	800-869-6783
27-Apr-09	MN	Minneapolis	Ted K. Madison, MA CCC-A	612-625-2443
27-Apr-09	ME	Watervillel	Anne Louise P. Giroux, AuD CCC-A	207-872-0320
29-Apr-09	AZ	Phoenix	Kathryn M. Deppensmith, MS CCC-A	800-369-6783
29-Apr-09	MD	Baltimore	Timothy A. Swisher, MA CCC-A	412-367-8690
29-Apr-09	WA	Seattle	Gaye Chinn, MS CCC-A FAAA CPS/A	206-764-3330
*30-Apr-09	AZ	Phoenix	Kathryn M. Deppensmith, MS CCC-A	800-869-6783
*30-Apr-09	WA	Seattle	Gaye Chinn, MS CCC-A FAAA CPS/A	206-764-3330
*05-May-09	ME	Waterville	Anne Louise P. Giroux, AuD CCC-A	207-872-0320
05-May-09	TN	Chattanooga	Melette L. Meloy, MS CCC-A	678-363-9897
06-May-09	MA	Auburn	Steven R. Fournier, AuD CPS/A	508-832-8484
06-May-09	TX	Houston	Johnny L. Sanders, MA CCC-A	800-869-6783
06-May-09	MI	Detroit	John H. Elmore, AuD MBA CCC-A	800-357-5759
06-May-09	GA	Roswel	Jason M. Feld, MCD CCC-A	770-475-2055
06-May-09	MO	St Louis	James J. Jerome, MA CCC-A	317-841-9829
06-May-09	OH	Cleveland	Carol Snyderwine	216-491-6104
*07-May-09	OH	Cleveland	Carol Snyderwine	216-491-6104
*07-May-09	TX	Houston	Johnny L. Sanders, MA CCC-A	800-869-6783
*07-May-09	MI	Detroit	John H. Elmore, AuD MBA CCC-A	800-357-5759
*07-May-09	GA	Roswell	Jason M. Feld, MCD CCC-A	770-475-2055
*07-May-09	TN	Chattanooga	Melette L. Meloy, MS CCC-A	678-363-9897
*07-May-09	MO	St Louis	James J. Jerome, MA CCC-A	317-841-9829
11-May-09	GA	Atlanta	Herbert J. Greenberg, PhD CCC-A	678-352-0312
*12-May-09	GA	Atlanta	Herbert J. Greenberg, PhD CCC-A	678-352-0312
12-May-09	DC	Washington	Diane M. Brewer, MA CCC-A	202-994-7167
*13-May-09	DC	Washington	Diane M. Brewer, MA CCC-A	202-994-7167
13-May-09	NC	Morrisville	Thomas H. Cameron, PhD CCC-A CPS/A	919-459-5255
13-May-09	MO	St Louis	John H. Elmore, AuD MBA CCC-A	800-357-5759
13-May-09	DE	Smyrna/Dover	Timothy A. Swisher, MA CCC-A	412-367-8690
13-May-09	SC	Greenville	Michele Alexander, MS CCC-A	336-834-8775
*14-May-09	MO	St Louis	John H. Elmore, AuD MBA CCC-A	800-357-5759
*14-May-09	DE	Smyrna/Dover	Timothy A. Swisher, MA CCC-A	412-367-8690
*14-May-09	SC	Greenville	Michele Alexander, MS CCC-A	336-834-8775
14-May-09	IA	Waterloo	Christine Pernetti, MA CCC-A	319-369-7569
*15-May-09	IA	Waterloo	Christine Pernetti, MA CCC-A	319-369-7569
19-May-09	IL	Chicago	Johnny L. Sanders, MA CCC-A	800-869-6783
19-May-09	PA	Bethlehem	James B. Robertson, AuD	215-836-9923
*20-May-09	IL	Chicago	Johnny L. Sanders, MA CCC-A	800-869-6783
*20-May-09	PA	Bethlehem	James B. Robertson, AuD	215-836-9923
20-May-09	CA	Fairfield	Charles E. Fankhauser, PhD	707-746-6334
*21-May-09	CA	Fairfield	Charles E. Fankhauser, PhD	707-746-6334
01-Jun-09	NE	Omaha	Thomas W. Norris, PhD	402-391-3982
02-Jun-09	MO	North Kanas City	Linda Kay Ratliff-Hober, MS CCC-A	913-268-0928
*03-Jun-09	MO	North Kansas City	Linda Kay Ratliff-Hober, MS CCC-A	913-268-0928
*03-Jun-09	NE	Omaha	Thomas W. Norris, PhD	402-391-3982
03-Jun-09	MD	Baltimore	Johnny L. Sanders, MA CCC-A	800-869-6783
03-Jun-09	OH	Columbus	James J. Jerome, MA CCC-A	317-841-9829
*04-Jun-09	MD	Baltimore	Johnny L. Sanders, MA CCC-A	800-869-6783
*04-Jun-09	OH	Columbus	James J. Jerome, MA CCC-A	317-841-9829
04-Jun-09	PA	Pittsburgh	Roger M. Angelelli, PhD	412-831-0430
*05-Jun-09	PA	Pittsburgh	Roger M. Angelelli, PhD	412-831-0430
05-Jun-09	KY	Louisville	John H. Elmore, AuD MBA CCC-A	800-357-5759
*06-Jun-09	KY	Louisville	John H. Elmore, AuD MBA CCC-A	800-357-5759
08-Jun-09	OH	Cincinnati	John H. Elmore, AuD MBA CCC-A	800-357-5759
*09-Jun-09	OH	Cincinnati	John H. Elmore, AuD MBA CCC-A	800-357-5759
10-Jun-09	NC	Morrisville	Thomas H. Cameron, PhD CCC-A CPS/A	919-459-5255
10-Jun-09	MO	St Louis	Johnny L. Sanders, MA CCC-A	800-869-6783
10-Jun-09	SC	Columbia	Melette L. Meloy, MS CCC-A	678-363-9897
10-Jun-09	PA	Harrisburg	Timothy A. Swisher, MA CCC-A	412-367-8690
10-Jun-09	NC	Greensboro	Cheryl S. Nadeau, MEd FAAA	336-834-8775
10-Jun-09	AL	Birmingham	Georgia W. Holmes, AuD CCC-A	205-934-7178
*11-Jun-09	MO	St Louis	Johnny L. Sanders, MA CCC-A	800-869-6783
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*11-Jun-09	AL	Birmingham	Georgia W. Holmes, AuD CCC-A	205-934-7178
*12-Jun-09	ME	Waterville	Anne Louise P. Giroux, AuD CCC-A	207-872-0320
12-Jun-09	SC	Charleston	Stuart L. Cohen, MAud	843-797-0275
*13-Jun-09	SC	Chareston	Stuart L. Cohen, MAud	843-797-0275
15-Jun-09	FL	West Palm Beach	Herbert J. Greenberg, PhD CCC-A	678-352-0312
15-Jun-09	OR	Portland	Thomas G. Dolan, PhD CCC-A	503-725-3264
*16-Jun-09	FL	West Palm Beach	Herbert J. Greenberg, PhD CCC-A	678-352-0312
*16-Jun-09	OR	Portland	Thomas G. Dolan, PhD CCC-A	503-725-3264
16-Jun-09	MA	Auburn	Steven R. Fournier, AuD CPS/A	508-832-8484
17-Jun-09	AR	Little Rock	Johnny L. Sanders, MA CCC-A	800-869-6783
17-Jun-09	NY	Amherst	David Todd Nelson, AuD FAAA CCC-A CPS/A	716-633-7210
*18-Jun-09	AR	Little Rock	Johnny L. Sanders, MA CCC-A	800-869-6783
23-Jun-09	IL	Chicago/ Schaumburg	Thomas D. Thunder, AuD FAAA INCE Bd.Ct.	847-359-1068
*24-Jun-09	IL	Chicago/ Schaumburg	Thomas D. Thunder, AuD FAAA INCE Bd.Ct.	847-359-1068
24-Jun-09	GA	Roswell	Jason M. Feld, MCD CCC-A	770-475-2055
24-Jun-09	TN	Nashville	Michele Alexander, MS CCC-A	336-834-8775
*25-Jun-09	GA	Roswell	Jason M. Feld, MCD CCC-A	770-475-2055
*25-Jun-09	TN	Nashville	Michele Alexander, MS CCC-A	336-834-8775
01-Jul-09	NY	Albany	Timothy A. Swisher, MA CCC-A	412-367-8690
*02-Jul-09	NY	Albany	Timothy A. Swisher, MA CCC-A	412-367-8690

continued on page 11

*indicates one-day recertification course

Upcoming OHC Certification and Recertification Courses 2009 — continued from page 10

Begin Date	State	City	Course Director	Phone
08-Jul-09	TX	Dallas/Ft Worth	John H. Elmore, AuD MBA CCC-A	800-357-5759
08-Jul-09	WI	Madison	James J. Jerome, MA CCC-A	317-841-9829
*09-Jul-09	TX	Dallas/Ft Worth	John H. Elmore, AuD MBA CCC-A	800-357-5759
*09-Jul-09	WI	Madison	James J. Jerome, MA CCC-A	317-841-9829
10-Jul-09	NC	Morrisville	Thomas H. Cameron, PhD CCC-A CPS/A	919-459-5255
*13-Jul-09	GA	Atlanta	Herbert J. Greenberg, PhD CCC-A	678-352-0312
13-Jul-09	IA	Davenport	James J. Jerome, MA CCC-A	317-841-9829
*14-Jul-09	GA	Atlanta	Herbert J. Greenberg, PhD CCC-A	678-352-0312
*14-Jul-09	IA	Davenport	James J. Jerome, MA CCC-A	317-841-9829
15-Jul-09	TX	Houston	Johnny L. Sanders, MA CCC-A	800-869-6783
15-Jul-09	TX	San Antonio	John H. Elmore, AuD MBA CCC-A	800-357-5759
15-Jul-09	AR	Little Rock	Michele Alexander, MS CCC-A	336-834-8775
15-Jul-09	WA	Seattle	Amy R. Stewart, MA CCC-A	206-764-3330
*16-Jul-09	TX	Houston	Johnny L. Sanders, MA CCC-A	800-869-6783
*16-Jul-09	TX	San Antonio	John H. Elmore, AuD MBA CCC-A	800-357-5759
*16-Jul-09	AR	Little Rock	Michele Alexander, MS CCC-A	336-834-8775
*16-Jul-09	WA	Seattle	Amy R. Stewart, MA CCC-A	206-764-3330
22-Jul-09	GA	Atlanta	Melette L. Meloy, MS CCC-A	678-363-9897
22-Jul-09	NC	Greensboro	Cheryl S. Nadeau, MEd FAAA	336-834-8775
*23-Jul-09	GA	Atlanta	Melette L. Meloy, MS CCC-A	678-363-9897
*23-Jul-09	NC	Greensboro	Cheryl S. Nadeau, MEd FAAA	336-834-8775
23-Jul-09	PA	Kittanning	Douglas N. Callen, PhD FAAA CCC/SPA	724-543-7068
*24-Jul-09	PA	Kittanning	Douglas N. Callen, PhD FAAA CCC/SPA	724-543-7068
28-Jul-09	MO	North Kansas City	Linda Kay Ratliff-Hober, MS CCC-A	913-268-0928
*29-Jul-09	MO	North Kansas City	Linda Kay Ratliff-Hober, MS CCC-A	913-268-0928
29-Jul-09	OH	Dayton	Chris M. Pavlakos, PhD	937-436-1161
29-Jul-09	MN	Minneapolis	Kathryn M. Deppensmith, MS CCC-A	800-869-6783
*30-Jul-09	MN	Minneapolis	Kathryn M. Deppensmith, MS CCC-A	800-869-6783
*31-Jul-09	OH	Dayton	Chris M. Pavlakos, PhD	937-436-1161

*indicates one-day recertification course

Assessing a Non-Standard Day… — continued from page 9

Tubbs, R.L. (1990). Health hazard evaluation: Memphis Fire Department. (HHE report 86-138-2017). National Institute for Occupational Safety and Health, Cincinnati, Ohio.

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Tubbs, R.L. (1995). Noise and hearing loss in Fire Fighting. Occupational Medicine, 10 (4), 851-852.

Tubbs, R.L. (2004). Time-weighted averages and firefighters hearing loss. Update, 16 (2).

Peter Zymanczyk has worked in London Fire Brigade for over 29 years, 16 of them in the health and safety division. As a group manager, he has been involved in all areas of health and safety work and has a broad qualification base. He is a Chartered Safety Practitioner and a member of the Chartered Management Institute and the Institution of Fire Engineers. He is married with three children and lives in Harrow, North West London.

SAVE the DATE

Upcoming **Course Director** Workshop

Friday, November 13, 2009
8:00am-4:00pm
Warwick Hotel
Philadelphia, PA

SAVE the DATE

Upcoming **Professional Supervisor** Workshop

Saturday, November 14, 2009
8:00am-4:00pm
Warwick Hotel
Philadelphia, PA

See CAOHC website **www.caohc.org** for further details.

CAOHC Council Members and The Organizations They Represent

Chair
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Pacific Hearing Conservation, Inc.
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Military Audiology Association
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American Industrial Hygiene Association
Quest Technologies & Metrasonics, Inc.
Oconomowoc, WI

Education
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Military Audiology Association
Proponency Office of Preventive Medicine
Office of the Surgeon General–National Capitol Region
Falls Church, VA

Paul J. Brownson, MD FACOEM FAAFP
American College of Occupational & Environmental- Medicine
The Dow Chemical Company
Indianapolis, IN

Diane S. DeGaetano, RN, BSN, COHN-S, COHC
American Association of Occupational Health Nurses
Merial, Ltd.
Duluth, GA

Lee D. Hager
American Industrial Hygiene Association
Sonomax Hearing Healthcare/Aearo Technologies
Portland, MI

Madeleine J. Kerr, PhD, RN
American Association of Occupational Health Nurses
Univ. of MN/School of Nursing
Minneapolis, MN

David D. Lee, MIS CIH CSP
American Society of Safety Engineers
Reno, NV

Ted K. Madison, MA CCC-A
American Speech-Language-Hearing Association
3M Occupational Health and Environmental Safety Div.
St. Paul MN

J.Adin Mann, III, PhD
Institute of Noise Control Engineering
Iowa State University
Ames, IA

Peter M. Rabinowitz, MD MPH
American College of Occupational and Environmental Medicine
Yale Occupational & Environmental Medical Program
New Haven, CT

Ronald D. Schaible, CIH CSP PE(Mass)
American Society of Safety Engineers
Robson Forensic, Inc.
Lancaster, PA

Mark R. Stephenson, PhD
American Academy of Audiology
CDC/NIOSH
Cincinnati, OH

Robert Thayer Sataloff, MD DMA FACS
American Academy of Otolaryngology - Head & Neck Surgery
Drexel University
Philadelphia, PA

Laurie L. Wells, AuD FAAA CPS/A
American Academy of Audiology
Associates in Acoustics, Inc..
Loveland, CO

Stephen J. Wetmore, MD, MBA
American Academy of Otolaryngology - Head & Neck Surgery
R.C. Byrd Health Science/WVA Univ.
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