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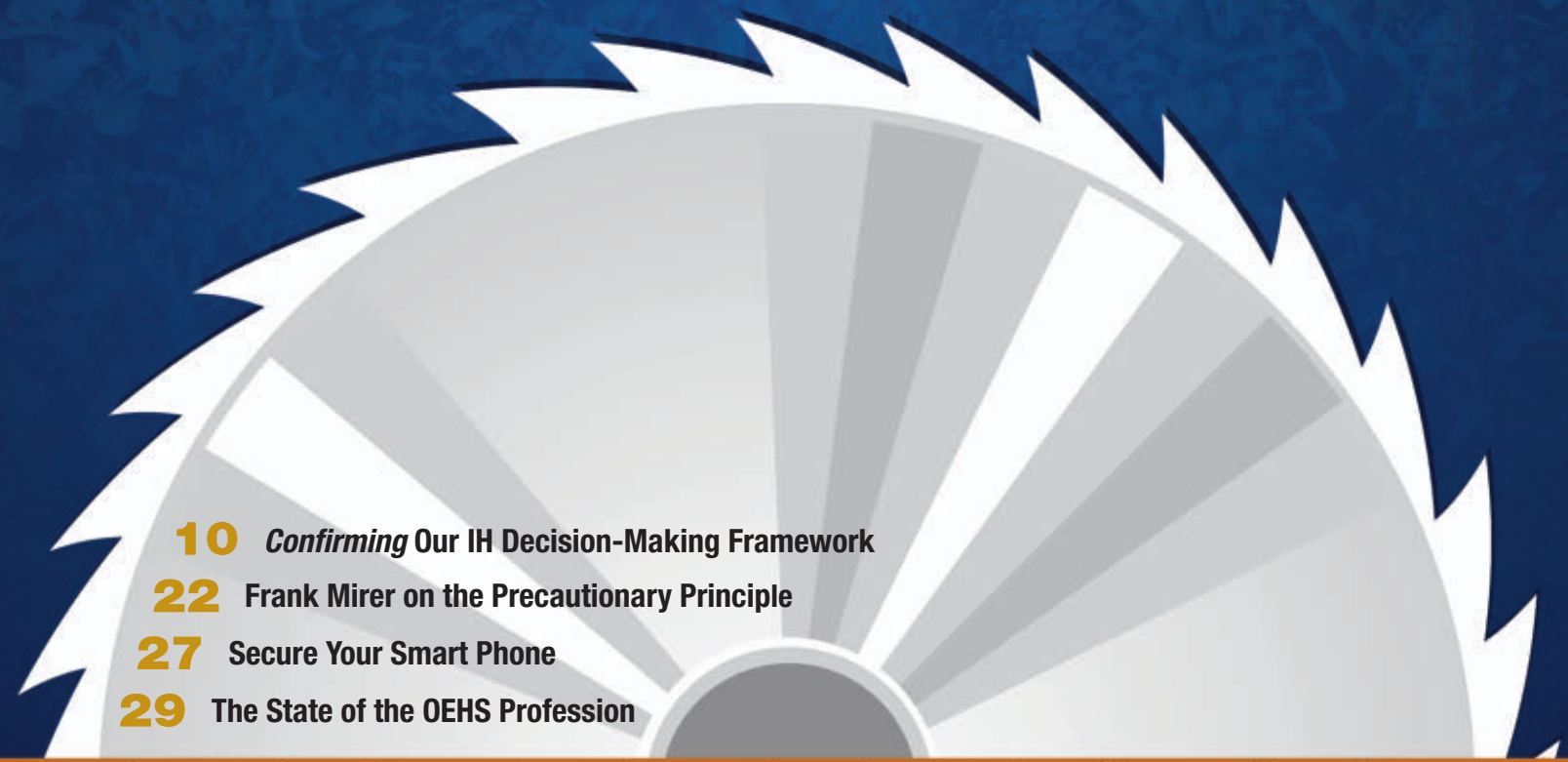

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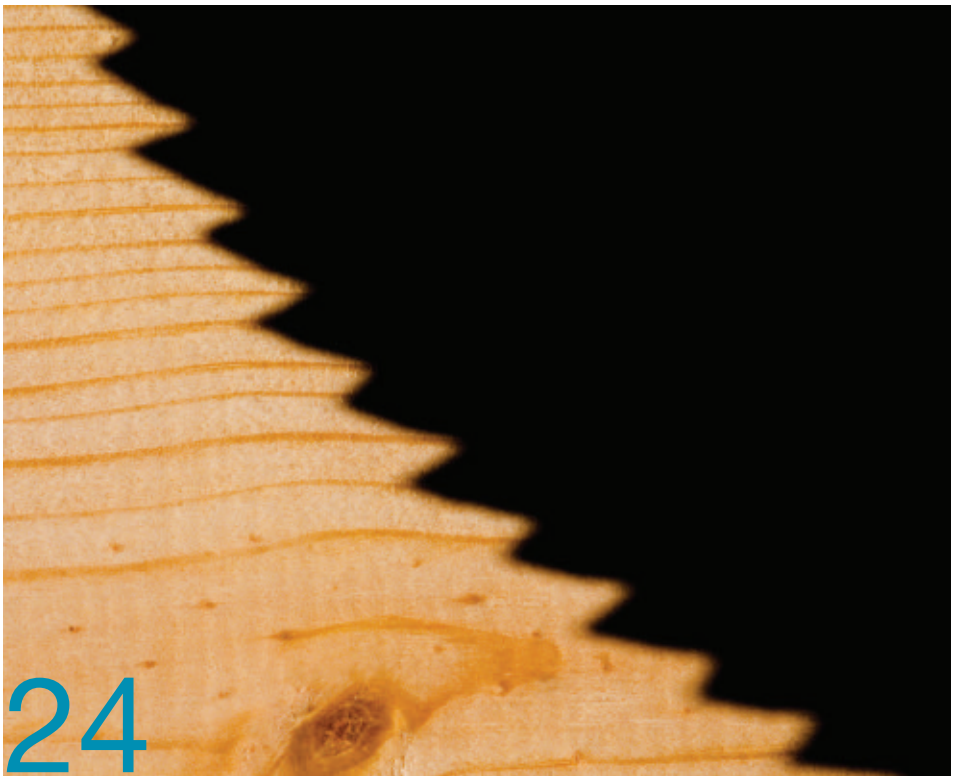

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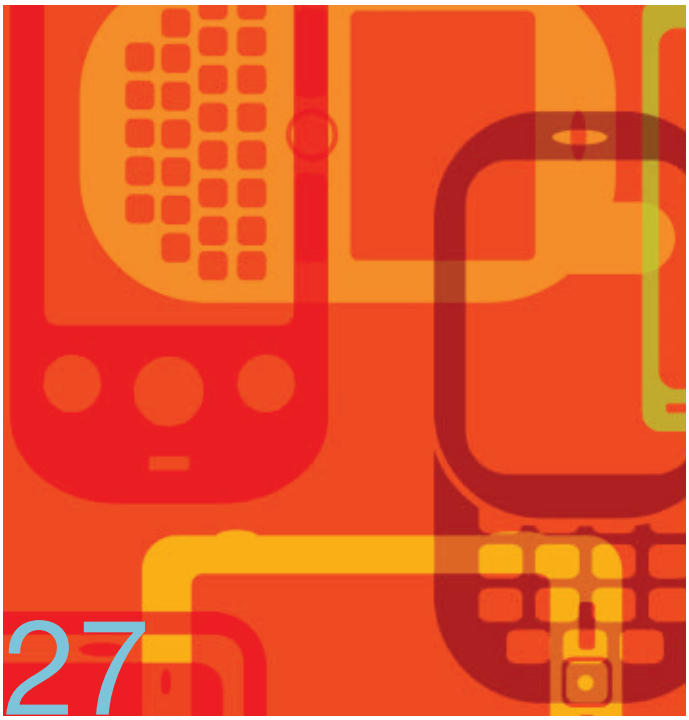

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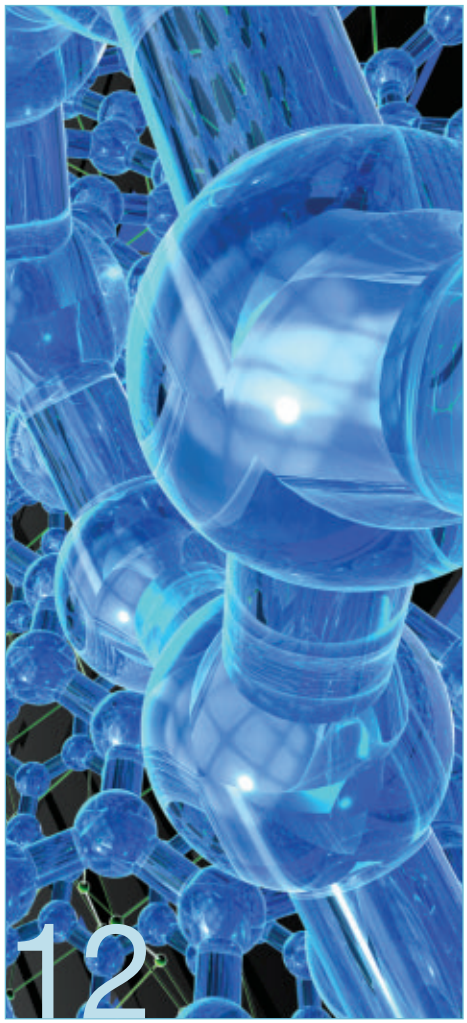

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The Synergist's mission is to provide AIHA members with news and information about the occupational and environmental health and safety fields and the industrial hygiene profession. *The Synergist* focuses on industry trends and news, government and regulatory activities, key issues facing the profession, appropriate technical information and news on association events and activities.

The Synergist's objective is to present information that is newsworthy and of general interest in industrial hygiene. Opinions, claims, conclusions and positions expressed in this publication are the authors' or persons' quoted and do not necessarily reflect the opinions of the editors, AIHA or *The Synergist*.

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President's Message

Balancing the Budget 101

BY MICHAEL T. BRANDT, AIHA® PRESIDENT

For several years, AIHA presidents and treasurers have written in *The Synergist* about AIHA's financial strength—a product of good management, the foresight of past Boards of Directors, and strong staff execution of the direction given by the Board. These articles also focused on the need for AIHA to be nimble and make difficult decisions in response to changes in our finances.

Responding to Change

In March 2010, Past President Cathy Cole and Vice President Allan Fleeger wrote a column that forecast reduced revenues and expressed AIHA's commitment to raising revenues and decreasing expenses to achieve a balanced budget by the end of the fiscal year. While we remain in a very strong financial position with reserves in excess of $10M, our revenues did not grow enough to offset our expenses, resulting in a budget deficit for this fiscal year. The budget forecast for FY 2011 shows that our deficit will grow unless we take steps to align expenses with revenue forecasts. Even then, we anticipate a deficit for at least one additional budget cycle.

AIHA staff and volunteer leaders are currently finalizing the budget for FY 2011. What is apparent is that we continue to add products and services to support each of you as members without pruning any of them. It's always easier to add a new member service than it is to eliminate one. As a result of the severe economic recession over the past two years, AIHA revenues have not kept pace with our expenses, creating a deficit. I want to reassure each of you that this deficit does not in any way threaten the overall viability of AIHA as an organization. Prudent fiscal policy, adopted by past Boards, stipulates that our excellent cash reserves can be used only in an emergency (such as a conference being cancelled due to a pandemic), not to resolve a budget deficit. Our current deficit has clearly pointed out to staff and volunteer leaders that business as usual is no longer an option. So let me describe how we plan to resolve the budget deficit.

New Approach

During our strategic planning meeting in July, we formed a team of staff and Board members to develop a process for evaluating our mix of products and services against the priorities established in our new strategic plan. This team, led by President-elect Elizabeth Pullen, is now developing options to align our products and services around AIHA's new focus that industrial hygiene is an exposure assessment and exposure risk management profession dedicated to preventing occupational disease. Simplistically speaking, we will compare each product and service against this focus and against the priorities established in the strategic plan and recommend either cost reductions or elimination of the product or service. These decisions will likely be phased in over a two- to three-year period.

Our immediate goal is to maximize members' benefits and systematically analyze opportunities to improve our budget position by reducing products and services. However, each of us will feel the impact of the tough decisions that need to be made. We ask for your support during this difficult process, which will help us be responsible stewards of AIHA finances and ensure that AIHA continues to offer the high quality products, services and representation that you value and expect from our volunteer leaders and staff.

Michael T. Brandt, DrPH, CIH, PMP, is technical chief of staff for Operations at Los Alamos National Laboratory in Los Alamos, N.M. He can be reached at (505) 667-1228 or mtbrandt@lanl.gov.

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Leadership Perspective

Confirming Our IH Decision-Making Framework

BY MARK D. HOOVER, TOM ARMSTRONG, TIM BLODGETT, ALLAN K. FLEEGER, PERRY W. LOGAN, BILL MCARTHUR, AND PAUL J. MIDDENDORF

For much of the 20th century, our industrial hygiene community was well served by the widely accepted decision-making framework of "recognize, evaluate, and control." This framework was substantially strengthened in the 1990s by inclusion of "anticipate." Now it is time to further strengthen the framework by incorporating the concept of confirmation so that our comprehensive IH decision-making framework becomes "Anticipate, Recognize, Evaluate, Control, and Confirm."

Rationale for "Confirm"

We approach this suggested revision of the framework from several perspectives. Fundamentally, "confirm" has always been implicit in the framework, and it is clearly implicit in the discussion and pictorials contained in the AIHA® *Strategy for Assessing and Managing Occupational Exposures*. However, it isn't explicit, and the IH profession could benefit from making it explicit in the decision-making framework. We believe its inclusion would send a clearer message about how IH is conducted to practitioners and to our partners in other fields that we work with, such as engineers, managers, and others.

Making the "confirm" step more explicit may reduce the resistance we often get while building toward new risk management approaches, such as control banding. The "fine print" in control banding paradigms includes a measurement requirement, which is essentially a confirmation component, but inclusion of a formal "confirm" step in the IH decision-making framework would make it clear that reasonable measures must be taken to confirm the efficacy of any control approach.

Making the "confirm" step explicit may also support a more rational process for determining when and how many measurements should be made. New guidance from emerging areas, such as Bayesian approaches to exposure assessment, may help us avoid unneeded measurements and focus on the significant measurements needed to understand and confirm that exposures are within statutory limits and as low as practicable.

Overall confirmation of the adequacy of risk management can include evaluation of results from occupational epidemiologic studies. Confirmation, documentation, and continuous improvement of the entire decision-making process can ensure that all steps are scientifically grounded and appropriately applied.

A Community Opportunity

In keeping with the adage that actions speak louder than words, the most effective path forward for our IH community will be to adopt and employ the comprehensive framework in our research, classrooms, standards, and workplaces.

No formal mechanism is required to incorporate this concept into professional practice. If it makes sense, let's make it a part of our everyday practice.

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NewsWatch

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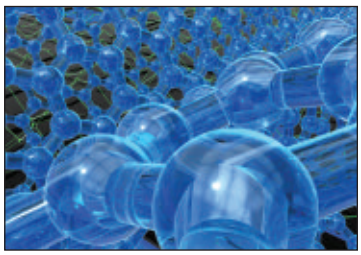
NANOTECHNOLOGY

NIOSH Recommends Exposure Limit for Carbon Nanotubes and Nanofibers

NIOSH is proposing a recommended exposure limit (REL) of 7 µg/m^3 for carbon nanotubes and carbon nanofibers, the agency announced in December. The REL is included in a draft of a "current intelligence bulletin" that summarizes occupational safety and health implications, recommends work-related control measures, and identifies areas for additional research. A public meeting to discuss these topics is scheduled for Feb. 3 in Cincinnati, Ohio.



The draft of the bulletin states that the proposed REL "may not be completely health protective" but that it should "help lower the risk of developing [work-related] lung disease and assist employers in establishing an occupational health surveillance program that includes elements of hazard and medical surveillance." NIOSH advocates optimal use of sampling and analysis to reduce airborne concentrations of carbon nanotubes and nanofibers as low as possible.

The draft also recommends a strategic approach for assessing potential work-related exposures and risks, controlling exposures through a hierarchy of measures, instituting appropriate medical screening programs, and educating workers on sources and job tasks that may expose them to these types of nanomaterials.

To view the draft document, visit www.cdc.gov/niosh/docket/review/docket161A/. The draft will be available for public comment until Feb. 18.

CHEMICAL SAFETY

EPA to Expand Chemicals Screening for Endocrine Disruption

EPA will extend testing to 134 chemicals identified as potentially harmful to the endocrine system, according to a Nov. 16 press release. The chemicals indentified include those designated as priorities under the Safe Drinking Water Act (SDWA) and are used in products like solvents, gasoline, plastics, personal care products, pesticides and pharmaceuticals.

"Americans today are exposed to more chemicals in our products, our environment and our bodies than ever before, and it is essential that EPA takes every step to gather information and prevent risks," said EPA Administrator Lisa P. Jackson. "We are using the best available science to examine a larger list of chemicals and ensure that they are not contaminating the water we drink and exposing adults and children to potential harm."

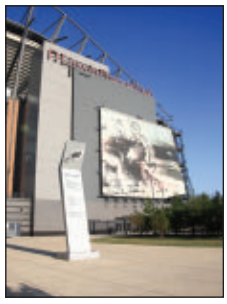
In addition, EPA released draft policies and procedures that require the agency to maintain chemical screening, endorse fair cost-sharing, and address issues concerning chemicals under the SDWA. EPA will order pesticide registrants and chemical manufacturers to produce data that will determine whether their chemicals disrupt the estrogen, androgen and thyroid passageways in the endocrine system.

EPA press releases are available at www.epa.gov/newsroom/newsreleases.htm#date. For more information about the Endocrine Disruptor Screening Program, visit www.epa.gov/endo.

SUSTAINABILITY

Philadelphia Eagles Go Green(er)

With the installation of nearly 2,500 solar panels, 80 20-foot-tall wind turbines, and a generator that runs on biodiesel and natural gas, Lincoln Financial Field, home of the Philadelphia Eagles, is set to become the first stadium to produce all its own energy. According to the *New York Times* ("For Eagles, a Winning Mix of Wind, Biodiesel and Solar," Nov. 17), this project is the latest in a series of green initiatives instituted by the Eagles since the stadium opened in 2003. The team expects a decrease of almost 25 percent in energy costs in the first year.



Solar panels, wind turbines, and a dual-fuel co-generation plant are expected to be installed by September 2011. The turbines and panels will meet about 25 percent of the stadium's energy needs. The Eagles have also requested that Aramark, the food service and cleaning contractor at Lincoln Financial Field, use nontoxic cleaning supplies and environmentally friendly plates, cups and utensils.

To read the *Times* article, go to www.nytimes.com/2010/11/18/sports/football/18stadium.html?_r=1&ref=sports.

PERSONAL PROTECTION TECHNOLOGY

IOM Releases Report on Personal Protection Technology

In November 2010, the Institute of Medicine (IOM) released a pre-published version of the *Report Certifying Personal Protection Technologies*. The report gives recommendations for NIOSH and the National Personal Protective Technology Laboratory

(NPPTL) on conformity assessment processes for personal protection technologies (PPT) to prevent or decrease hazardous exposures on the job.

Pre-published reports are uncorrected proofs that allow timely access to a committee's findings.

In addition to including recommendations on conformity assessment processes, the report suggests improvements to research, standards development, and communication, and the creation of a PPT and OSH surveillance system.

The IOM report is available at www.nap.edu/catalog.php?record_id=12962.

PROPOSED RULES

OSHA to Hold Hearing on Slips, Trips and Falls

On Jan. 18, 2011, OSHA will hold an informal public hearing on proposed revisions to the Walking-Working Surfaces and Personal Protection Equipment (PPE) standards. The proposed rule, which was published in the May 24 *Federal Register*, aims to prevent the nearly 20 fatalities and 3,700 injuries that occur in the workplace annually.

In the proposed rule, OSHA recommends applying new requirements for fall protection PPE that are consistent with industry voluntary consensus standards. The agency also proposes amendments that would make general industry walking-working surfaces standards more consistent with construction and shipyard industry standards.

To read the meeting announcement in the *Federal Register*, go to http://edocket.access.gpo.gov/2010/2010-28544.htm. The text of the proposed rule is available at http://edocket.access.gpo.gov/2010/2010-10418.htm.

LEAD

Lead Found in Reusable Grocery Bags Triggers Call for Federal Investigation

New York Senator Charles Schumer called for a federal investigation of reusable grocery bags after a *Tampa Tribune* investigation found lead in bags sold at various grocery stores and retailers, according to an article in *USA Today*. The toxins found in these bags could lead to environmental problems in landfills and leach into the food products that are carried in them. The lead found in bags tested by *The Tampa Tribune* would not easily rub off on food and touching the bags is not hazardous, reports Tampa Bay Online. However, as the

[Continued: 14]

[From: 13]

bags wear down over time, their paint can chip off and thread frays can release lead.

In a letter requesting an investigation by the Food and Drug Administration, Sen. Schumer says federal agencies need to ban reusable grocery bags that contain lead. Retailers such as Publix and Winn-Dixie are also taking action by asking suppliers to make bags with less lead. In early September, Wegmans announced that it would no longer sell two designs after tests revealed they may have elevated lead levels.

The *USA Today* article is available at www.usatoday.com/money/industries/environment/2010-11-15-toxicbags15_st_N.htm. To read the article on Tampa Bay Online, visit www2.tbo.com/content/2010/nov/14/141928/sen-chuck-schumer-calls-for-federal-investigation-/.

NOISE

Quiet, Please

The National Academy of Engineering, an independent organization that advises the government, recently published its latest report on noise control, *Technology for a Quieter America*. The report describes cost-benefit trade-offs between efforts to mitigate noise and the improvements made, and the need to educate professionals who deal with noise.

Technology for a Quieter America is intended for a broad audience including the engineering community, the public, all levels of government, private industry, labor unions, and nonprofits. The report acknowledges that reducing product noise emission and achieving noise reduction in factories, offices, classrooms, homes, and the environment are challenging issues. At times, noise can be loud enough to damage hearing; at lower levels, noise can disrupt normal living, affect sleep patterns, affect our ability to concentrate at work, interfere with recreational activities, and, in some cases, interfere with communications and even cause accidents.

The report can be purchased from www.nap.edu.

CHEMICAL SAFETY

Web Dialogue on Chemical Exposures to Be Held in Early January

An online dialogue about the U.S. approach to protecting the public's health from harmful chemical exposures will be held Jan. 5–6. The

[Continued: 16]

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[From: 14]

dialogue is organized by the National Conversation on Public Health and Chemical exposures, a collaborative initiative supported by the CDC and the Agency for Toxic Substances and Disease Registry (ATSDR). Interested parties must register at www.webdialogues.net/cs/nationalconversation-action-home/view/di/229?x-t=home to participate in the dialogue.

In mid-December, the Leadership Council of the National Conversation shared its draft action agenda at www.resolv.org/nationalconversation/monitoring.htm. The agenda is based on reports from six working groups, input from a previous online dialogue, and insights from partner organizations. The working group reports are also available at www.resolv.org/nationalconversation/monitoring.htm.

CHEMICAL SAFETY

EPA Adopts New Approach for Identifying Alternatives to Hazardous Chemicals

New criteria adopted by EPA's Design for the Environment (DfE) program are intended to help companies and other organizations identify safer alternatives to hazardous chemicals, the agency announced Nov. 30.

The DfE program works in partnership with industry, environmental groups, and academia to help industry choose safer alternatives to chemicals that may pose a concern to human health or the environment. Information on chemical hazards from DfE Alternatives Assessments is combined with industry data on performance and cost to guide the choice of safer alternatives. To distinguish among alternatives, DfE evaluates data for each chemical and assigns hazard levels of high, moderate, or low for human health and environmental concerns.

DfE Alternatives Assessments will be conducted for bisphenol A (BPA), phthalates, decabromodiphenyl ether (decaBDE), hexabromocyclododecane (HBCD) and nonylphenol and nonylphenol ethoxylates (NP and NPEs). Both the BPA and decaBDE efforts are under way and include the use of BPA and its alternatives in thermal paper, such as cash register receipts, and the review of flame retardant alternatives to decaBDE in products such as textiles, plastic palettes, and electronics. Assessments of phthalates, the flame retardant HBCD, and NPEs will begin in 2011.

EPA will accept comments on the criteria through Jan. 31. For more information, read the agency press release at www.epa.gov/newsroom/newsreleases.htm#date.

AWARD

EU Honors Film about Goldmine Worker

All That Glitters, a film about a worker in a Kyrgyzstani goldmine, won the second annual Healthy Workplaces Film Award sponsored by European Agency for Safety and Healthy at Work (EU-OSHA). Accepting his €8000 prize at the 53rd International Leipzig Festival for Documentary and Animated Film, Tomas Kudrna, the director of the winning film,

[Continued: 18]

AIHA Public Policy Survey

PELs, I2P2 Top AIHA® List of Public Policy OEHS Issues

Updating OSHA's permissible exposure limits (PELs) and requiring employers to establish an injury and illness prevention program (I2P2) are the most important issues facing occupational and environmental health and safety, according to the latest AIHA survey of its membership. The biennial survey was conducted online in October 2010.

The other top OEHS issues, according to respondents, are as follows:

- Adoption of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)
- Professional recognition/title protection
- OSHA reform and NIOSH recognition
- Laboratory accreditation

The survey also asked respondents to rank issues according to importance in several categories, including those related to OSHA, EPA, federal/state legislative matters, and AIHA-specific concerns. More information about the survey results is available at www.aiha.org.

[From: 16]

said his film showed the importance of strict safety precautions when working at altitude with dangerous chemicals to extract gold from rock.

The seven films nominated for the Healthy Workplaces Film Award addressed the physical, psychological and economic consequences of unfavorable working conditions, EU-OSHA stated in a press release. The nominated films were selected from 2,813 documentaries from 97 countries.

For more information about the Healthy Workplaces Film Award, visit http://osha.europa.eu/en/campaigns/hw2008/Film-Award.

CHEMICAL SAFETY

EPA Reports Progress Toward Predicting Chemical Toxicity

EPA's ToxCast screening program has begun screening approximately 1,000 chemicals for potential toxicity to people and the environment, the agency announced Nov. 30. ToxCast is designed to determine the impacts of chemical exposures on the human body. According to EPA, ToxCast will eventually be able to screen thousands of chemicals in fast, cost-effective tests.

"ToxCast integrates revolutionary advances in molecular biology, chemistry and computer science to quickly and cost-effectively screen chemicals," said Dr. Paul Anastas, assistant administrator of EPA's Office of Research and Development, in an agency press release. "This groundbreaking approach to chemical toxicity testing allows us to start predicting potential toxicity to human health and the environment instead of just describing the toxic effects that occur after chemical exposure."

ToxCast is currently screening 700 chemicals found in industrial and consumer products, food additives and drugs that were not placed on the market. The program has already screened about 300 chemicals, mostly pesticides, which EPA scientists have compared to animal studies available in EPA databases. This

comparison is helping determine which ToxCast assays can accurately predict different types of toxicity and disease, according to EPA.

To read more about ToxCast and to view a list of chemicals being screened, visit www.epa.gov/comptox. The EPA press release on ToxCast is available at www.epa.gov/newsroom/newsreleases.htm#date.

RESEARCH

Study Suggests Link Between Diesel Exhaust Exposure and Lung Cancer

Occupational exposures to diesel exhaust may increase risk for lung cancer, according to findings published in October by the *American Journal of Respiratory and Critical Care Medicine*. The study found that workers with the greatest lifetime exposure to diesel exhaust had a 30 percent higher risk of developing lung cancer than people with no occupational exposure.

An abstract of the study, "Exposure to Diesel Motor Exhaust and Lung Cancer Risk in a Pooled Analysis from Case-Control Studies in Europe and Canada," is available from http://ajrccm.atsjournals.org.

NOISE

OSHA Extends Comment Period for Proposed Reinterpretation of Noise Standards

Six weeks after publishing a proposed reinterpretation of noise exposure standards in the Federal Register, OSHA announced that it would extend the comment period by 90 days. According to OSHA, the proposed reinterpretation would make enforcement of the hearing conservation standard consistent with enforcement of other agency standards by clarifying the term "feasible administrative or engineering controls" as used in OSHA's general industry and construction occupational noise exposure standards.

The new deadline for submitting comments about OSHA's proposed reinterpretation is March 21. Comments may be submitted online at www.regulations.gov.

OSHA's current enforcement policy for noise exposures of less than 100 decibels has allowed many employers to rely upon a hearing conservation program, including the use of hearing protectors such as ear plugs, according to the agency. The proposed reinterpretation would clarify that employers are required to use feasible engineering and administrative controls as the primary means of reducing noise exposure.

"There is sufficient evidence that hearing protection alone cannot prevent workers from suffering preventable

[Continued: 20]

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hearing loss," said David Michaels, assistant secretary of labor for OSHA. "Easily applied administrative or engineering controls can and must be used to protect workers. There are plenty of employers out there who play by the rules and want to do the right thing, and we're hopeful we can work with them to craft a policy that's good for all."

The OSHA proposal is available at http://edocket.access.gpo.gov/2010/2010-26135.htm.

DIACETYL

OSHA Bulletin Targets Exposures to Diacetyl and Substitutes

OSHA released a Safety and Health Information Bulletin and companion Worker Alert in December that recommend safety measures for preventing worker exposures to the potentially fatal health effects of butter flavorings and other flavoring substances containing diacetyl or its substitutes. The documents were released six days after California became the first state to implement a new standard intended to protect workers employed in the production of diacetyl.

OSHA "strongly" recommends that all flavoring and food manufacturers review and consider implementing applicable recommendations regarding engineering and work practice control measures, medical surveillance, workplace monitoring, and use of appropriate personal protective equipment to minimize each worker's exposure to these flavoring substances.

Currently, OSHA does not have permissible exposure limits for most flavoring substances, including diacetyl. However, flavorings manufacturing facilities are subject to other applicable OSHA mandatory standards including Respiratory Protection and Hazard Communication. Based on concerns for workers' safety and health, OSHA is updating its National Emphasis Program on Microwave Popcorn Plants to include diacetyl substitutes, and has initiated rulemaking on occupational exposure to diacetyl and food flavorings containing diacetyl.

The Safety and Health Information Bulletin on diacetyl is available at www.osha.gov/dts/shib/shib10142010.html, and the Worker Alert can be accessed at https://www.osha.gov/SLTC/flavoringlung/diacetyl_worker_alert.html.

For more information on diacetyl and other food flavorings, visit www.osha.gov/SLTC/flavoringlung/index.html and www.osha.gov/dsg/guidance/diacetyl-guidance.html.

Information about California OSHA's diacetyl standard can be found at www.dir.ca.gov/oshsb/Diacetyl.html.

In Brief

A new independent agency for worker safety on offshore drilling rigs and production platforms is one likely recommendation of President Obama's oil spill commission, according to a Dec. 2 post on the National Public Radio blog "The Two-Way" (www.npr.org/blogs/thetwo-way/).

A study published in November by the online journal *PLoS One* supports the theory that airborne particles from coughs can carry flu viruses ("Measurements of Airborne Influenza Virus in Aerosol Particles from Human Coughs," www.plosone.org).

Massey Energy announced Dec. 1 it would close a Kentucky mine that MSHA had sought court permission to seize (multiple sources).

Long-term exposure to pesticides may increase the risk of Alzheimer's disease and other forms of dementia, according to a study published in *Occupational and Environmental Medicine* ("Neurobehavioral effects of long-term exposure to pesticides," abstract available from http://oem.bmj.com).

France requested that the European Chemicals Agency reclassify formaldehyde as a category one (carcinogenic to humans) substance, the European Trade Union Institute reported in late November (http://hesa.etui-rehs.org/uk/default.asp).

An enhanced safety device shows promise for reducing sharps injuries among health-care workers, according to a study published in the December issue of the *American Journal of Infection Control* ("Sharps injury reduction using a sharps container with enhanced engineering," abstract available at www.ajicjournal.org/home).

Researchers determined that ten samples of butter from Dallas-area grocery stores contained traces of the flame retardant PBDE ("What's flame retardant doing in your butter?", *Philadelphia Inquirer*, Dec. 7).

RISK ASSESSMENT

"Unknown Knowns" and the Precautionary Principle

A New Taxonomy for Risk Assessment

BY FRANK MIRER

"There are known knowns; there are things we know that we know. There are known unknowns; that is to say, there are things that we now know we don't know. But there are also unknown unknowns; there are things we do not know we don't know."

—Former U.S. Secretary of Defense Donald Rumsfeld

While Donald Rumsfeld and I don't often agree, I find his "known knowns," "known unknowns," and "unknown unknowns" to be an effective taxonomy for risk assessment. After spending a weekend at the Collegium Ramazzini meeting—a hotbed of fellow precautionary principle advocates, REACH enthusiasts and nanotechnology distrusters—I'd create an additional category for "unknown knowns" in occupational health. Unknown knowns, or maybe ignored knowns or forgotten knowns, are the material results (which could support rulemaking) recognized by authoritative bodies but forgotten or ignored by the IH and public health communities.

The Rumsfeldian Taxonomy

For practitioners, it's a known known that, with the exception of 16 substances, OSHA has not promulgated permissible exposure limits (PELs) based on post-1970 science and policy assumptions. For several dozen substances, a significant risk to workers exposed at the PEL is also a known known.

The known unknown is the number of workers likely to be exposed at levels lower than the PEL, but which pose a significant risk. Knowing this answer would establish priorities for setting new PELs.

The notion of unknown knowns is applicable to nanotechnology. Carbon black (a low-tech version of carbon nanotubes) and nano-sized titanium dioxide are clearly carcinogenic in laboratory studies. Diesel particulate matter, a nanoparticle aerosol, is "probably" carcinogenic to humans according to the International Agency for Research on Cancer (IARC). Yet the statements of public health advocates on the need for "precautionary" approaches to nanoparticles undermine the fact that scientifically justified exposure limits, or reference concentrations factors of 10 below the canonical 5 mg/m^3 limit for nuisance dust, could be set now. Personally, I'd start at 0.100 µg/m^3 for nano titanium dioxide and go down from there. Profoundly greater potency associated with nanoparticle form may emerge later, but intermediate action could be started today.

The carcinogenicity of sulfuric acid mist (strong acid mists containing sulfuric acid, which IARC classifies as Group 1, carcinogenic to humans), is another unknown known—a hazard identified by epidemiology of workers likely exposed at levels below the current PEL. The number of workers exposed at known carcinogenic levels isn't known.

IARC's Knowns and Unknowns

IARC recently published two important, authoritative listings of knowns and unknowns for "priority" carcinogens:

***A Review of Human Carcinogens*, Volume 100**, is available in summary at http://monographs.iarc.fr/ENG/Meetings/index1.php (log in to *The Lancet Oncology* to get the summaries without charge). Six working groups updated earlier monographs, including two groups dealing with multiple agents found in the occupational environment. Their reports affirmed existing human carcinogens (IARC Group 1) and added anatomical sites with sufficient evidence. Their most notable conclusion is that sufficient evidence exists to associate cancer of the larynx and ovaries with asbestos exposure, and leukemia with formaldehyde exposure.

IARC Publication 42, "Identification of research needs to resolve the carcinogenicity of high priority IARC carcinogens," was initiated by NIOSH in collaboration with IARC, the National Institute of Environmental Health Sciences (NIEHS), the American Cancer Society (ACS), and the National Cancer Institute (NCI). The publication included a selection of 20 agents, previously reviewed in IARC monographs, based on their potential for workplace or environmental exposure and their importance or interest by a particular agency. The purpose was to identify research needed to develop a more definitive classification and to help funding agencies determine possible

projects to support. The agents are mostly Group 2A and 2B (probable and possible carcinogens) with a few Group 3 (unclassifiable); formaldehyde is the lone Group 1 agent. The full text is available at http://monographs.iarc.fr/ENG/Publications/techrep42/index.php.

Readers should go to these sites to see what's known and what's unknown. For Volume 100, the agents are known knowns; estimating exposure in the human studies would lead straight to acceptable exposure limits.

For Report 42, what's known largely corresponds to hazard identification: sufficient evidence in laboratory studies and limited evidence of carcinogenicity in people. In many cases, Report 42 includes substantial information on exposure response (i.e., potency) for estimating risks at occupational exposure levels. These risks, therefore, are either known knowns or unknown knowns. In my opinion, the data needs addressed in Report 42 are largely those necessary to overcome management objections or Houdini risk assessments.

The review of welding fumes in IARC Publication 42 exemplifies the frozen state of worker protection. IARC has categorized welding fumes as Group 2B (possibly carcinogenic to humans) since 1990. The 2010 summary states:

> As reviewed by Ambroise et al. (2006), there have been around 60 studies published that are informative about lung cancer risks in welders. While there remained some uncertainty about possible confounding by smoking and by asbestos, and some possible publication bias, the overwhelming evidence is that there has been an excess risk of lung cancer among welders as a whole in the order of 20%-40%.

Personally, I'd pull the trigger on "sufficient" evidence in people, although a working group would have to read those 60 studies to draw a conclusion. The review found only spotty laboratory data. The document is about research needs, so it called for more epidemiology, but another study added to 60 extant studies is not likely to change the picture. A 20 percent excess of lung cancer is about a 1 percent risk, 10 times the border of significance. The recommendations for laboratory research are also weak. I believe the highest priority must be given to a full-scale inhalation bioassay of nano-sized iron oxide—not because it's needed for the "sufficient" classification or exposure response assessment for welding, but because widespread exposures to iron oxide particles are likely in other settings.

OSHA doesn't have a PEL for welding fume but allows 10 mg/m^3 for iron oxide. NIOSH recommends lowest feasible exposure for welding fume because it's carcinogenic, but the absence of a recommended exposure limit (REL) provides zero guidance. The ACGIH® TLV® is 5 mg/m^3.

The Precautionary Principle and Intentional Indecision

The precautionary principle is hardly a fringe concept. It's embodied in the UN World Charter for Nature (1982), the UN Rio Declaration on Environment and Development (1992), the Wingspread Conference Report (1998) and a report from the European Commission (2000) (http://ec.europa.eu/dgs/health_consumer/library/pub/pub07_en.pdf). From the Rio Declaration:

> In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

The precautionary principle is intended to guide decision making in the face of uncertainty. Conservative scholars attack the precautionary principle, insisting on detailed quantitative risk assessments and cost-benefit analyses as the basis of any government intervention in economic activity, such as exposing workers to chemicals. The current climate for chemical hazard control in the occupational environment forces workers to suffer from our refusal to decide in the face of certainty. The precautionary principle is needed for issues that correspond to Rumsfeld's "unknown unknowns."

There is some precautionary tilt in the OSHA law and in U.S. environmental legislation. The Clean Air Act amendments of 1990 require users of air toxics to apply the "maximum available control technology" (MACT) in new source review, regardless of whether risky exposures are predicted. That tilt is limited. For example, the Toxic Substances Control Act requires EPA to present existing evidence of danger from a chemical before it can order testing to find evidence of danger. This flaw explains, in part, EPA's failure to order test rules for existing chemicals such as metalworking fluids. Some interpretations of the OSH Act require the agency to show "significant risk" from uncontrolled exposure levels before ordering routine engineering controls.

Shifting the framing of chemical exposure limits toward a precautionary approach is important for the hundreds of chemicals and chemical mixtures in workplaces. Applying an MACT approach to industrial processes that generate worker exposures is important. Reduction of toxic chemical use is important. "Green" chemistry is attractive, although I question whether the hazards of "safer" substitutes are known. All of these priorities have ramifications for the known unknowns and unknown unknowns.

However, focusing on the known knowns and unknown knowns is much more immediate and productive. In my experience, IH is effective when there's an OEL to target and vague and ineffective without it.

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Sound the Alarm

SHOULD WE BE WORRIED ABOUT WOOD DUST EXPOSURES?

BY MARTIN HARPER

If more than two million workers were found to be exposed above an occupational exposure limit in Europe, and a similar number were likely to be overexposed in the United States and Canada—not to mention an undetermined number in other countries—wouldn't we be alarmed? This is the current situation with wood dust.

Many of us who have enjoyed carpentry, at school in wood shop or at home as hobbyists, have experienced the tickly effect of inhaling wood dust. Perhaps we dismissed this effect because of the pleasing odor of liberated resins and other chemicals from freshly cut wood. However, many millions of workers worldwide are exposed to wood dust on a daily basis, frequently at high concentrations. Only rarely has this exposure been considered more than a nuisance.

Health Effects and Risk

Exposure to wood dust has been implicated in nonmalignant respiratory diseases including obstructive disease of the lower airways and reactive disease of the upper airways. Dozens of studies have been published, along with several reviews. In developing its threshold limit value (TLV®) for wood dust, ACGIH®[1] included only studies in which exposure was to wood dust rather than to exogenous chemicals, such as formaldehyde, isocyanates, or other chemicals with a known respiratory effect, and only studies for which dust concentrations were measured and reported. Even with these restrictions, ACGIH could still draw from studies in many countries including Denmark, Sweden, the Netherlands, England and Wales, the U.S., Canada, Australia, New Zealand and Taiwan. In some cases, multiple studies originated in a single country.

The expected symptoms—nasal obstruction, irritation, itching, discharge and sneezing—were reported in many of these studies, but, perhaps more importantly, decreased lung function was also often observed relative to controls or cross-shift, as were increases in the occurrence of diagnosed obstructive respiratory disease, such as asthma and emphysema or bronchitis. These effects were observed among workers exposed to wood dust from a variety of tree species in a variety of settings (e.g., lumber mills, furniture manufacturing, cabinetmaking) and countries.

From the available data on wood dust measurements, estimates have been made for the threshold wood dust concentration—the exposure level below

which disease is unlikely. In 2005, ACGIH used these studies to set its TLV of 1 mg/m^3 for inhalable particulate of wood dust (other than western red cedar, which had a separate TLV based on asthma alone) based on preventing decreases in pulmonary function. However, excess longitudinal decline in lung function with exposure to wood dust was not observed in two more recent epidemiologic surveys of wood processing industry workers.[2,3]

One effect attributed to wood dust exposure is cancer. Several studies have suggested that certain wood dusts, especially oak and beech, but perhaps also birch, mahogany, teak and walnut, may cause nasal cancer. However, nasal cancer in general is rare,[4] and adenocarcinoma, the cancer most often attributed to wood dust exposure, makes up only about 10 percent of nasal cancers. Further, there is likely a very long latency period (20–30 years), and since we know that limits for wood dust exposures are lower today than in the past, it is possible that much higher exposures were associated with higher risk.

Finally, the mechanism by which exposure to wood dust increases the risk of cancer is not clear. Therefore, there may be some contention surrounding the risk of cancer from wood dust, especially at lower levels of exposure. Nevertheless, the International Agency for Research on Cancer (IARC) has published on the carcinogenic potential for certain wood dusts.[5] While exposure limit values are not normally suggested for carcinogens, and the critical health effect for the ACGIH TLV is pulmonary function, the TLV documentation notes that levels below 1 mg/m^3 inhalable particulate mass may also prevent the development of wood dust-associated sino-nasal cancer in addition to preventing symptoms of impaired pulmonary function. The designation of wood dust as a potential or actual human carcinogen has also influenced the NIOSH-recommended exposure limit of 1 mg/m^3. In France, Decree No. 2003-1254 set an inhalable limit value for wood dust in workplaces at 1 mg/m^3, which came into force in 2005. This is the lowest legal limit in Europe, and for this reason France is a major contributor to the symposium WoodDust2011. (See the sidebar for more information.) In 2002, the European Scientific Committee on Occupational Exposure Limits (SCOEL) stated that exposures greater than 0.5 mg/m^3 of wood dust could cause pulmonary effects and should be avoided. This would have been based on "total" dust measurements, which are known to underestimate the actual fraction inhaled. Thus, SCOEL later noted[6] that the equivalent inhalable fraction of wood dust was probably 1–1.5 mg/m^3.

A recent major European study[7] involving 25 countries concluded that 3.6 million workers were exposed to wood dust in these countries. The largest percentage—approximately one-third—came

Wood Dust Symposium at AIHce 2011

WoodDust2011 (www.WoodDust2011.org) will be held as a part of AIHce 2011 in Portland, Ore. AIHce runs from May 14 through 19, while WoodDust2011 will be held all day on Tuesday, May 17, and the morning of Wednesday, May 18. Entry is free with registration to AIHce, but single-day registrations are also available.

WoodDust2011 is the third international symposium on wood dust and the first to be held in the U.S. Logging and wood products are a mainstay of Oregon's economy as well as that of surrounding states and Canadian provinces. This international conference will feature over 30 podium presentations and posters submitted from the U.S., Canada, France, Denmark, Sweden, Finland, Germany, Switzerland, Italy and India. The program will include the following topics:

- Particle characteristics and methods of sampling
- Exposure assessment
- Toxicology and biological mechanisms
- Human health effects
- Epidemiology and risk assessment
- Risk management and control

Among the papers will be several presentations related to asthma, including one on work-related asthma due to wood dust in California; studies on allergenic resin acids including possible modes of sensitization; and a new method for exposure measurement. Other papers discuss exposures to exogenous chemicals related to wood exposure, including formaldehyde and polyaromatic hydrocarbons.

Since this will be the first symposium on wood dust in the U.S., there will be reports of the activities of ACGIH, IARC and SCOEL as well as reports where the regulatory authority has already adopted (France) or is in the process of possibly adopting (Cal-OSHA) lower limit values. There will be papers concerning recent research into the most appropriate methodology for wood dust measurements to meet these limit values, such as those recently published on inhalable samplers by the groups at NIOSH[8] and the Institut National de Recherché et de Sécurité (INRS).[9,10] Finally, there will be papers on controls and their efficacy.

Dr. Peter Görner of INRS in France and I are co-chairs of the symposium. We welcome attendance of anyone who has an interest in this topic. We would like to acknowledge financial support for the symposium from NIOSH through a Public Health Practice Proposal grant through the National Occupational Research Agenda (NORA) Agriculture, Forestry and Fishing (AFF) Sector and the tremendous support of AIHA, particularly its conference support staff. Other nonfinancial sponsors of the symposium include the American Wood Council (AWC) of the American Forest & Paper Association (AF&PA) and the National Council for Air and Stream Improvement, Inc. (NCASI).

—Martin Harper

from the construction industry and represented 9 percent of all construction workers. These workers were also among the highest exposed, with 79 percent exposed above 1 mg/m^3. Given these statistics, the WoodDust2011 symposium welcomes the support of the Center for Construction Research and Training (CPWR). Approximately two-thirds (62 percent or 2.2 million) of the overall total of exposed workers were estimated to be exposed above 1 mg/m^3.

Need for Control

The situation in North America is hardly likely to be different in either numbers of exposed workers or levels of exposures, and wood is a major part of the economy in many countries. Assessing the total number of workers worldwide who might be exposed to more than 1 mg/m^3 of inhalable wood dust is difficult, but the European estimates suggest as many as 30 million.

Thirty million overexposed workers is certainly a wake-up call, but reducing wood dust exposures is not a simple matter. Many more woodworking establishments have operations where exposures are closer to OSHA's permissible exposure limit of 15 mg/m^3 than are below 1 mg/m^3. In these operations, the acute risk of fire or explosion can be a greater and more immediate problem. Machines can be fitted with controls, but these may be disconnected or worn and offer little or no protection.

For one study, I was asked to assess worker exposures before and after the installation of a downdraft table. It worked, reducing exposures from several mg/m^3 to below 0.5 mg/m^3. However, the tables were expensive—affordable in this workplace of more than 1,000 employees but perhaps out of reach of smaller operations. Research into methods of control will be crucial in aiding employers and workers to comply with lower exposure limit values.

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Wood Dust Research in *JOEH*

The following are the most recent papers on wood dust exposure to appear in the *Journal of Occupational and Environmental Health*:

- July 2010: "Surveillance of Washington OSHA Exposure Data to Identify Uncharacterized or Emerging Occupational Health Hazards" by Don J. Lofgren, Carolyn K. Reeb-Whitaker, and Darrin Adams.
- August 2009: "Exposure to Wood Dust and Its Particle Size Distribution in a Rubberwood Sawmill in Thailand" by Nutjaree Saejiw, Naesinee Chaiear, and Steven Sadhra.
- February 2009: "Wood Dust Particle and Mass Concentrations and Filtration Efficiency in Sanding of Wood Materials" by Irma Welling, Matti Lehtimäki, Sari Rautio, et al.
- August 2008: "A Survey of Size-Fractionated Dust Levels in the U.S. Wood Processing Industry" by Medhat I. Kalliny, Joseph A. Brisolara, Henry Glindmeyer, et al.
- May 2008: "Exposure to Wood Dust, Resin Acids, and Volatile Organic Compounds During Production of Wood Pellets" by Katja Hagström, Sara Axelsson, Helena Arvidsson, et al.

Members can access the full text of these and other *JOEH* articles via www.aiha.org.

Disclaimer

The findings and conclusions in this article are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention. Mention of non-U.S. governmental limit values does not constitute endorsement.

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Smart Security

Tips for Securing Your Smart Phone

BY MARK ROLLINS

The development of "smart devices" has given EHS professionals unprecedented mobile productivity. These powerful products can receive e-mail, take photos, run custom programs, and even access company databases. We are a far cry from the day when the only things our mobile phone did were make and receive calls.

But there is a dark side to all this power. The potential for confidential or business-critical data to be compromised or stolen is far greater with these devices if we don't take proper precautions.

This article discusses basic security considerations for smart devices. Note, however, that none of the recommendations or suggestions here guarantee that data cannot be compromised. Much of this article is geared toward the individual and the small business user. If you work for a larger company, you can probably assume that your Information Technology department set up your device properly—though, again, there are no guarantees, and I don't mean to say that everyone's IT group did it correctly or completely.

Passwords

Let's first examine the most basic level of security: a lock-screen password. This feature is arguably the first and most important step for security. If you record the user IDs and passwords to all of your accounts—Amazon, eBay, banking, etc.—in your smart device's address book, you can literally lose almost everything if your device is compromised.

I highly recommended that you not use a password like "0001," which is easy to key in with one thumb but provides little security. Alphanumeric passwords, which some smart devices allow, are much more effective, but you should enable this feature only if your device has voice dialing. You don't want to be driving down the highway at 70 mph trying to key in "Fun&Sushi4" to make an important conference call.

You will infer from my example that a phrase used to secure a smart device should not be easy to guess. A good practice for passwords is to use a mix of upper- and lower-case letters, numbers and punctuation. One common but ineffective trick is to pair a simple word (such as names of seasons) with a seemingly random error. This practice is extremely dangerous from the standpoint of device and data security. If the password for the Droid you bought this past June is "Summer2012," you should know that your crafty use of an incorrect year isn't fooling anyone.

I recommend using passwords based on childhood or personal experiences that would be difficult to guess (not birthdays). For example, if you used to live at 1323 Maple Lane, "1323MapleLane!" makes an excellent password. You could even record it as a mnemonic clue ("13M!"), which no one would be likely to recognize.

Some of the first-line defenses below go hand in hand with a complex password. (These may already be enabled on your device if you work at a large corporation.)

Auto-lock. Any device should automatically lock itself after a predefined period of inactivity, usually 5 to 10 minutes. With this feature enabled, if you don't touch the screen or provide any input to the device, it will shut itself off, requiring a password to turn it on again.

Hardware encryption. The data stored on some smart devices is written in a scrambled manner that is not easily decoded. Check with the manufacturer to verify whether your device has this feature.

Auto-wipe. Some devices have a feature that automatically erases its memory following a predetermined number (usually 10) of failed password attempts. If a device with this feature is stolen, the thief has only 10 tries before his new smart phone becomes an expensive, attractive paperweight. Meanwhile, the owner can replace the phone and recover all data from her backup.

Backups. An important part of smart-device security, backups ensure that loss or theft doesn't mean your data is irretrievable. Backups should also be stored as encrypted data or password-protected; options vary by device and software. Security for backups is recommended for two reasons: first, many people store extensive personal and confidential information on their smart devices; and, second, smart devices often inspire a disproportionate amount of corporate angst. (How many of you have a laptop that auto-wipes after 10 failed passwords or can be located by global positioning system?)

Remote Wipes and Memory Cards

One often overlooked security concern is physical access to a device. Despite what you've seen in the movies, no one seated behind you on a train will be able to use special software to pull all the data from your smart device. But unrestricted access to your device for days or weeks (for example, if it was stolen) can allow unscrupulous individuals to run custom software that might access data—even encrypted data.

This threat is reduced by a "remote wipe" feature, which many devices support. A remote wipe removes all data from your device; either you or, more likely, your company's IT department can trigger it. However, there may be delays before remote wiping is possible, and every minute counts. Learn the procedures for notifying IT that a device is lost, and find out how long it takes to initiate a remote wipe. Using a borrowed cell phone to plead with your company's help desk to remote wipe your stolen device is not the time to learn that they won't because they can't verify it's really you calling.

For reasons of theft and loss I recommend against using a belt holster, which makes your smart device far too likely to fall off or be taken. When going through a security screening, put the smart device in your bag or purse. Sitting by itself in a plastic bin, your device becomes a tempting target for thieves. At the very least, you or someone else could innocently take the wrong phone.

Memory cards present similar concerns. Removing and replacing them undetected is all too easily accomplished. Most smart devices have a capacity as great as 64 gigabytes, rendering memory cards unnecessary. If you must have a memory card, be sure that your device is set to encrypt data on the card as well as the device. This might require purchasing third-party software.

Apps

Apps extend the functionality of smart devices, but they are more limited in scope than most applications for desktop and laptop computers. While a relatively small number of well-regarded companies develop traditional applications, apps are created by thousands of essentially unknown developers. Take the following precautions when dealing with apps:

- Only download or install apps from trusted sources. Blackberry (www.blackberry.com/appworld), Apple iPhone (iTunes), Android (www.android.com/market), and Windows Mobile (http://marketplace.windowsphone.com) have their own app stores.
- Don't change security settings to allow installation of apps from untrustworthy sources. One noteworthy scam involved an Android app, ostensibly for personal banking, that was harvesting user IDs and login information. Installing an app from a trusted source does not guarantee security, but at least these apps have been vetted by their store hosts.
- If you use finance apps, which help with home accounting and expense reports, don't store your password in your device. Instead, log in each time you use the app. Some finance apps also require a PIN, which they don't store.
- If you are using an app designed to connect to an e-commerce website such as Amazon.com or to a social website such as Twitter, install only the app provided by that company. Using other apps may expose personal account or other sensitive information. If a company e-commerce app doesn't exist, just use the website instead.
- Set up your device so that it does not remember passwords for websites. Disable provisions that allow auto-login to wireless networks.

Honey Pots and Other Issues

Downloading apps from unknown sources is an obvious security risk. Here are a few seemingly innocuous situations that could threaten the security of your device.

Wireless networks. If you're in an airport and have a choice of three WiFi connections—one that's $15 per day, another that's $8 per hour, and a third that's free—which would you pick? Unless you know for sure the source of the free WiFi—for example, Starbucks, AT&T, Boingo—this choice could be a "honey pot" trap—an attempt to intercept confidential data. A good tip-off that a network is not trusted is the name "Free WiFi" or similar.

Text messages and calendar items. Although not usually considered security threats, text messages and calendar items can display confidential information on the smart device's notification screen even if the device is locked. Change your settings to allow only the sender's name or the meeting time to appear on-screen.

GPS. Many companies are just now beginning to deal with security issues related to smart devices with global positioning system (GPS) features. Some smart devices use GPS to report their location, which is helpful if you're trying to find a lost device. (If you think your smart device was stolen, contact the authorities instead of tracking it down yourself.)

But if your device is GPS-enabled, nothing can prevent your IT department from monitoring your location. Let's say someone at your company wants to find out whether you're playing golf when you're supposed to be on a business trip. They locate you instead at a competitor's headquarters, where you are part of a team working on top-secret merger plans. This information could be disastrous if made public. For situations such as this, your company should implement a personal location privacy policy.

Tempting Targets

With their constantly improving functionality, smart devices have become tempting targets for snoops and thieves. Prudent changes to your device's settings and observation of basic precautions can keep your device and your company's data as secure as possible.

Mark Rollins, CIH, CSP, is a member of AIHA's Computer Applications Committee. He can be reached at (781) 622-1128 or mark.rollins@thermofisher.com.

Are You Ready for the New Normal?

New research shows passion and experience serve pros well amid angst and uncertainty

BY DAVE JOHNSON

Economists call it the new normal: slow economic growth, projected to be much more sluggish in 2011 than forecasted earlier (the International Monetary Fund predicts the U.S. gross domestic product to expand 2.3 percent this year). High unemployment, in the 10-percent range. Insecure consumers, worried about jobs and falling home prices, reigning in their spending. Fragile financial and real estate markets. Manufacturers muddling through. Stalled construction.

Particularly for the baby boomer generation, who enjoyed a long ride of economic good times during their peak earning years, the uncertainty since the recession of 2007–2008 has been sobering. So how are occupational and environmental health professionals, a work force dominated by boomers, coping with the new normal?

This annual "state of the nation" article is based on two surveys: a joint American Industrial Hygiene Association®-*Industrial Safety & Hygiene News* Industry Expert Survey of 646 AIHA® members conducted by AIHA in October 2010; and *ISHN*'s 27th annual White Paper reader research survey of 363 magazine subscribers conducted by *ISHN* in September 2010.

Baby Boomers Are the Backbone

Make no mistake: baby boomers are the backbone of both surveys. Almost three out of four AIHA members surveyed are 45 years of age or older. More than half (58 percent) are 50 or older. *ISHN*'s White Paper survey, with 63 percent of respondents possessing occupational safety jobs, presents a similar picture of a "graying" profession: 63 percent are 50 years or older, with 47 percent between 50 and 59.

For the sake of comparison, this article characterizes AIHA survey respondents as occupational and environmental health pros (OEHPs), while *ISHN* White Paper respondents have a more singular occupational safety focus.

The Age of Angst

Not surprisingly, the new normal brings with it job distress and longer work hours. More than half (52 percent) of OEHPs and 50 percent of occupational safety professionals say levels of job-related distress will increase in 2011. An identical percentage of both groups (44 percent) anticipate work hours to increase this year.

The uncertainty that underpins the new normal, not surprisingly, affects feelings of job security. About one in five occupational safety pros responding to *ISHN*'s White Paper survey report they are worried about job security this year. Almost two-thirds (64 percent) say the employment picture in their city or region is not improving. About the same number (65 percent) emphasize that the most pressing issues currently confronting safety pros are the economic difficulties at home and at work, frozen staffing, and the inability of companies to invest in worker safety.

Shoot the Messenger?

One particular threat exists to worker safety and health due to the climate of uncertainty. It is directly expressed in the *ISHN* survey: 52 percent agree with the statement, "The majority of safety and health pros lack the courage of their convictions to put their current jobs and future career aspirations at risk by standing up and speaking out about problems due to economic conditions and corporate politics."

Two-thirds (66 percent) of AIHA survey respondents agree that "external factors, such as economic conditions and corporate politics, affect safety and health professionals' willingness to acknowledge problems or concerns."

Fear of Reporting?

If professionals hesitate to speak up about risks, what effect is economic insecurity having on employees' willingness to report problems, or even minor injuries? OSHA chief David Michaels

told the audience at last October's National Safety Congress in San Diego that he "frankly doesn't believe" in the national injury rates compiled from employer record keeping. Readers surveyed by ISHN are divided on the accuracy of record keeping: 58 percent believe the Bureau of Labor Statistics (BLS) injury and illness reports are accurate, and 42 percent do not.

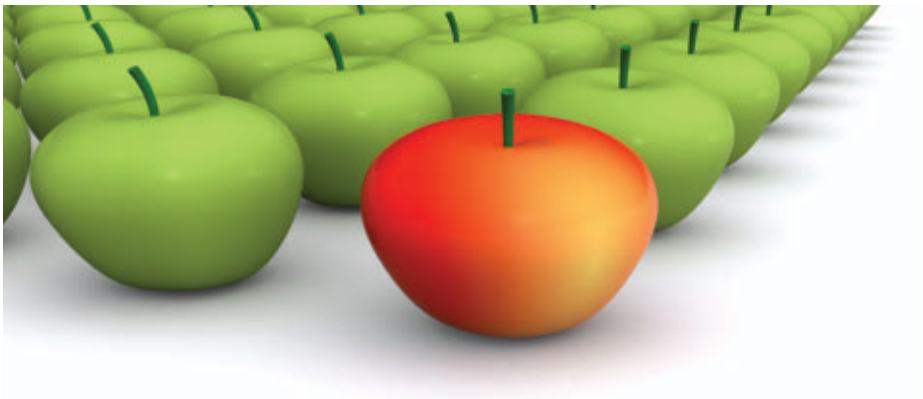
This is one of the more troubling findings from the two research projects, and warrants further investigation by AIHA, OSHA and the safety societies.

Deep-rooted Optimism

On a brighter note, the clouds hanging over the professional landscape do not darken what seems to be an innate positive outlook among pros. In *ISHN*'s White Paper survey, 28 percent of respondents believe conditions affecting job security, the effectiveness of their safety and health programs, and the profit/loss of their organizations will improve in 2011, and 35 percent are cautiously optimistic about improvements. Only 23 percent believe 2011 will provide the same business conditions that existed in 2010, and only 14 percent are pessimistic, believing conditions could get worse or that things—job security, pay, program effectiveness, company finances—will never return to prerecession highs.

Similar optimism and resilience is evident in the AIHA survey. Almost half of those surveyed (45 percent) say the level of their effectiveness as professionals will increase in 2011, and only 10 percent expect it to decline. This bullish attitude exists despite uncertain resource support. In 2011, 23 percent of those surveyed by AIHA say budgets and staffs will increase; an equal percentage of 23 percent say support will decline. Forty-six percent report no change in resource support.

A similar story of spirit and savvy emerges from ISHN's White Paper survey. Only 14 percent say budgets and staffs will increase in 2011, while 25 percent are looking at declining resources, and 60 percent confront stagnant resource support. Still, 40 percent report the level of their effectiveness as a professional will increase in 2011; only eight percent say it will falter.



Fueling the Fire

Where does this feeling of empowerment come from? There are two possible explanations.

First, most of those surveyed are 45 years of age or older and have more than 20 years' experience in the field. They have learned to be resourceful and possess a sense of confidence that can only accrue through years of having "been there, done that, seen that."

Second, the AIHA survey details the many ways professionals can remain effective by maintaining their current body of knowledge: 59 percent attend one-day conferences; 47 percent emphasize independent reading; 46 percent conduct Internet research; and 43 percent take advantage of distance learning and self-study programs. In addition, 41 percent of AIHA survey respondents express an interest in obtaining the Certified Safety Professional (CSP) credential.

This determination to keep current with the types of knowledge required to be an effective professional, and even expand one's knowledge base by acquiring additional certifications, is impressive when taking into account that the majority of those surveyed are older than 45. It appears professionals embrace the concept of lifelong learning and being responsible for one's own career and future. And it's clear they are knowledge workers. Being a knowledge worker in this post-manufacturing, knowledge-centric economy, and being self-reliant in terms of personal development, could help explain the positive outlook most professionals have—and might explain why many professionals become independent, enterprising consultants.

The AIHA survey uncovers another reason for professionals' optimism in the face of the new normal: the nature and motivation of pros. The AIHA survey asked a probing question: "What was your main motivation/reason for choosing this profession?" None of the respondents say they got into the field to climb the corporate ladder (a motive that would be deflated by corporate downsizing and consolidations, pay cuts, and the lack of loyalty between employers and employees).

What occupational and environmental health pros enjoy about their work is difficult for even the worst recession since the Great Depression to extinguish: the fact that no two days are the same; diversity; the freedom of field work; the ability to mix science, law and interactions with people; the feeling of making a difference, as shared by more than a few respondents; the autonomy to conduct investigations and solve problems; the opportunity to help protect the environment, public health, worker safety and corporate identities.

Speaking of opportunities, 39 percent of AIHA survey respondents say their involvement in environmental sustainability activities for their company will increase in 2011. Thirty percent say their involvement in corporate social responsibility activities will expand.

Organizational Obstacles

The safety-focused professionals surveyed in *ISHN*'s White Paper research also describe their work as a passionate "calling" more than a career. And this is perhaps the reason they can endure some trying organizational challenges. Almost half (49 percent) of those surveyed by *ISHN* believe most executives "think they 'get' safety but in reality do not, yet nevertheless try to convey that they are among the converted." Forty-

four percent believe most execs "get it thoroughly and act accordingly."

Pros in large facilities, with 1,000 or more employees, are much more pessimistic. Only 34 percent believe execs "get it" and 61 percent say they don't. This is scary—larger operations generally pose the greatest risks to the most people, inside and outside facility perimeters.

Another obstacle: 59 percent of the White Paper respondents believe "most management executives delegate and dismiss safety to the people who report to them, rather than personally leading the charge to radical safety improvement."

An even greater percentage (68 percent) believe "the catch-all attribution of an incident to 'human error' or to 'mechanical failure' is inadequate, and indicates a lack of safety leadership by top management."

These discouraging perceptions of executive attitudes toward safety are obvious red flags that should be brought to the attention of groups such as The Business Roundtable, The Conference Board, the National Association of Manufacturers, and the U.S. Chamber of Commerce, as well as business publications such as *Fortune*, *Forbes* and the *Harvard Business Review*, and the faculty of business learning centers such as The Wharton School and Harvard Business School.

But *ISHN*'s White Paper research uncovers a pothole in the road to educating executives: deep divisions exist in the ranks of safety professionals, which make it difficult, if not impossible, to present a unified front when addressing business groups.

As shown in Table 1, readers surveyed by *ISHN* cannot agree on the causes of accidents, management's role in prevention, the nature of the profession's public image, the profession's tactics, and the accuracy and credibility of the profession's one universally accepted benchmark—the BLS injury and illness statistics.

The final point in Table 1 is critical to any discussion with business groups and executives because many in management evaluate safety and health performance solely on the basis of injury and illness numbers. If professionals cannot agree on the validity of the data, what does that confusion say to executives?

Table 1. A Fractured Front: Divisions Among Safety Professionals

ISHN's White Paper survey asked respondents to indicate whether they agree or disagree with the statements below:

Statement	Results
The majority of accidents are attributable to human error.	44% agree 22% disagree 33% undecided
Most causes of incidents are ultimately attributable to management priorities and decision making.	31% agree 33% disagree 21% undecided
OEHS professionals spend too much time on OSHA compliance versus noncompliance risk reduction	42% agree 58% disagree
OEHS professionals should become more active and do more to arouse safety outrage among employees, their families and the general public.	43% agree 22% disagree 35% undecided
OEHS professionals are perceived by the public and business colleagues as "OSHA professionals" rather than "safety and health professionals."	41% agree 28% disagree 31% undecided
BLS injuries and illness data is accurate.	58% agree 42% disagree

Generation Next

Perhaps the process of engaging business leadership on the need for deeper personal commitment to occupational and environmental health and safety will be left to the generation of professionals following the baby boomers. The demographics of the profession will undergo a sea change in the next five to ten years. The so-called "OSHA generation" will ease into retirement, replaced by professionals who have been less influenced by OSHA during their careers (the agency's activities and standards-setting in the past 20 years have decelerated dramatically from the 1970s and 1980s).

The new face of the profession will be more diverse. On a list of new members posted on the AIHA website, 36 percent of the 50 members are female. In contrast, women constitute only 16 percent of the respondents in this year's *ISHN* White Paper survey, which has an older sampling base.

The profession is slowly but surely embarking on its own new normal as demographics change. One possible aspect of this new normal will be the opportunities to discuss with management leadership on topics closer to mainstream business interests, such as sustainability, corporate social responsibility, management systems, global supply chain integrity, product stewardship, and leading indicators of performance. These will be far different and potentially more meaningful discussions than the old "keep us out of trouble with OSHA" talks.

But to realize the potential of the profession's new normal, *ISHN*'s White Paper research reveals an important demographic that must change—the current high percentage of pros who are undecided about critical issues of the day: 33 percent are undecided on the cause of accidents; 31 percent can't make up their minds about the profession's public image; 24 percent are uncertain whether pros have the courage of their convictions. Professionals cannot sit on the fence if the gap to mainstream business acceptance is to be bridged.

Dave Johnson has been editor of ISHN *since 1980. He can be reached at djsafe@verizon.net.*

Community

AIHA NEWS ■ FOUNDATION NEWS

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Register Early for AIHce 2011

Register for AIHce 2011 (May 14–19, Portland, Ore.) by March 15 and save over $350 on your registration. Compared to other national OEHS conferences, AIHce has the lowest registration fees and offers more education.

Attendees consistently point to the high quality of the conference program and repeatedly praise the quality of the networking and the opportunities for renewing acquaintances with colleagues, meeting new friends and developing valuable business contacts. Attendees also consistently applaud the quality of the exposition, with its multitude of products, services, and interesting OEHS displays. For more information or to register, visit www.AIHce2011.org.

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Browse AIHA's Marketplace at www.aiha.org/market for books and standards that meet your professional needs. Topics include work environment, risk and hazard assessment, mold, IEQ and ventilation, ANSI/AIHA standards, OEHS principles, CIH exam prep, IH and OEHS management, and much more. Orders can be placed online or through Customer Service at (703) 849-8888.

Winners' Circle

Lora Dewey of GST BOCES in Elmira, N.Y., is the third-quarter *Synergist* fax-back card winner, and **Nancy Bloechl** is the third-quarter winner of *The Synergist* online survey that appears in the weekly AIHA® *E-ssential Connections* e-newsletter. Both are lucky recipients of $200 American Express gift cards.

Lawrence W. Whitehead, PhD, CIH, associate professor at the University of Texas Health Science Center at Houston, is the third-quarter winner of the Member-Get-a-Member (MGAM) campaign drawing. He received a $250 American Express gift card and the opportunity to snag free registration, airfare, and hotel to AIHce 2011 or PCIH 2011 during the grand prize drawing.

Cast Your Ballot in the 2011 AIHA® Board Elections

Once again, AIHA has partnered with Votenet, a nationally recognized company, to provide a safe, secure web-based voting system during the March 2011 Board of Directors election cycle. Beginning in early March, AIHA members will use their e-mail address and membership identification number to access the voting system.

Members who require a paper ballot must submit their request by e-mail to ballot@aiha.org no later than Friday, Feb. 25. The paper ballot will be mailed by early March and must be returned postmarked no later than Friday, March 18, to be counted in the election. For more information, please contact Judy Keithline at (703) 846-0702 or keithline@aiha.org.

AIHA-LAP, LLC and International Laboratories

Of the more than 300 laboratories accredited by the AIHA® Laboratory Accreditation Program (AIHA LAP, LLC), approximately 30 are located abroad. In the Asia Pacific region, for example, you can find an AIHA-accredited IH laboratory in Hong Kong and four in Japan.

The most recent laboratory to receive accreditation from AIHA-LAP, LLC is the Beijing Municipal Institute of Labour Protection (BMILP). BMILP established its IH laboratory in 2008 to expand services for workplace airborne monitoring and industrial hygiene analyses. This laboratory supports government activities, such as the 2009 Olympic Safety and Health project, and industries in Beijing. With two IH laboratories in Shanghai set to apply for accreditation in early 2011, AIHA-LAP LLC will likely have three Chinese laboratories accredited by the end of next year.

Now that AIHA-LAP, LLC is a full member of the International Laboratory Accreditation Cooperation (ILAC) and a signatory of the ILAC Mutual Recognition Arrangement (MRA), more laboratories in the Asia Pacific will probably seek IH accreditation by AIHA-LAP, LLC—especially since IH accreditation is not offered in most other global economies. Likewise, AIHA-accredited laboratories in the U.S. can expect more inquiries and business from customers in the Asia Pacific and other parts of the world, since results from AIHA-accredited laboratories are now accepted globally.

AIHA-LAP, LLC's international reach means that AIHA members doing business in the Asia Pacific and other parts of the world will have access to many highly competent IH laboratories, as they do in the United States.

For more information about accreditation of international laboratories, the ILAC MRA or AIHA-LAP accreditation, please contact AIHA-LAP, LLC Director Cheryl O. Morton at cmorton@aiha.org or (703) 846-0789.

Sponsor an International Affiliate Member

Any AIHA® member in good standing may sponsor an International Affiliate member by paying membership dues for that individual to join. Annual dues are $49 and are prorated. To be eligible, the sponsor must forward a completed application for the International Affiliate member being sponsored via mail, fax or e-mail to AIHA-sponsored members cannot apply online. The sponsor must also identify a specific person to sponsor. AIHA is unable to process applications that are not earmarked for a specific individual. For more information, contact AIHA Member Services at infonet@aiha.org.

CEC Accepting Membership Applications

The AIHA® Continuing Education Committee (CEC) is now accepting self-nominations for membership. The committee comprises 12 members who serve five one-year terms. The CEC's mission is to ensure quality educational opportunities that broaden knowledge, enhance technical competencies, and provide IHs with practical tools and skills. CEC members receive a variety of benefits, including free PDC registration(s) for auditing courses at AIHce.

Applications are due by March 15, 2011. For more information, contact Stacey Talbot, CEC staff liaison, at stalbot@aiha.org, or visit www.aiha.org/CEC.

Look Out for the 2011 *Consultants Listing*

The *Consultants Listing* is a comprehensive print and online directory of OEHS companies across the nation. This directory provides detailed, up-to-date information about listed companies' OEHS specialties and is requested by some of the top organizations in the industry.

The latest edition of the *Consultants Listing* will be published this month. If you missed the opportunity to purchase a listing, you can still get an online-only listing or be listed in the next published version, which will be the conference issue. For more information, contact Erin Breece at ebreece@aiha.org or (703) 846-0787.

Reap the Benefits: Renew Your Membership

In October, AIHA® began e-mailing membership renewal notifications. On Dec. 2, one 2011 dues invoice was sent through the mail. As part of its green initiative, AIHA encourages members to renew online at www.aiha.org/aboutaiha/AIHAMembership/Pages/JoinRenewAIHAMe.aspx. Members may also pay by check or money order—send payments to AIHA at P.O. Box 1519, Merrifield, VA 22116-9990. For information about member benefits, visit www.aiha.org/aboutaiha/AIHAMembership/Pages/MemberBenefits.aspx.

If you have not received a membership renewal e-mail, contact AIHA membership services at (703) 849-8888.

Online Synergist

Visit **www.aiha.org/SynergistCommunity** to read more about these and other AIHA news items.

Dates and Deadlines

Feb. 28: Deadline for 2011 Rachel Carson Award nominations.

March 5: Deadline for American Industrial Hygiene Foundation scholarship applications.

March 15: Advance registration deadline for AIHce 2011.

March 15: Deadline to submit applications for AIHA's Continuing Education Committee.

March 21: Deadline to submit student poster abstracts for AIHce 2011.

In Memoriam: Bernard E. Saltzman, 1918–2010

Dr. Bernard E. Saltzman, PE, CIH, died on Sept. 6, 2010, at the age of 92. A pioneer in the fields of industrial hygiene and air pollution and an honorary member of AIHA®, Dr. Saltzman developed what became the standard method of measuring the concentration of nitrogen dioxide in the atmosphere. Read more about Dr. Saltzman at http://bit.ly/hiRzjn.

Apply for AIHF Scholarships

The American Industrial Hygiene Foundation (AIHF) is now accepting applications for its 2011–2012 scholarships. Any student, full or associate member of AIHA® who is attending or applying to an ABET-accredited IH graduate or undergraduate program, a NIOSH Educational Research Centers IH program, a Council on Education Public Health-accredited program with occupational health emphasis, or New York University student applying for the Dr. Morton Lippmann Endowed Scholarship is eligible to apply. All applications must be received by March 5, 2011. For more information on AIHF, visit http://bit.ly/eKIEpy.

SECP Committee Pursues Partnerships

The AIHA® Students and Early Career Professionals (SECP) Committee is exploring formalized liaison positions linking local sections and student sections. According to Beau Middaugh, SECP member and president of the Student Local Section Council, liaisons appear to be useful for facilitating communicating between local section and student local section leaders, identifying synergistic goals and establishing appropriate connections in the local industrial hygiene community. Read more about the SECP's effort at http://bit.ly/hpvLzk.

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Send information about OEHS events to synergist@aiha.org. For a complete list of events, visit www.aiha.org/education/Pages/CalendarofEvents.aspx.

Continuous Enrollment
AIHA's Distance Learning Program offers a variety of topics in convenient and cost-effective formats such as TeleWeb virtual seminars, self-study workbooks, webcourses, DVDs and videos. Visit: www.aiha.org/education/ce/Pages/default.aspx.

AIHce 2010 Technical, General and Keynote Sessions are available as DVDs and downloads. Contact: (703) 849-8888; EduAssistant@aiha.org; www.conferencemedia.net/store/stores/aihce.

January 10–12
Minneapolis, Minnesota
24-Hour Waste Site Worker Training. Contact: www.sph.umn.edu/ce/trainings/coursepage.asp?activityId=9985.

January 10–13
Oakland, California
CIH Exam Workshop. Contact: www.bowenehs.com/details/7-cih-exam-workshop.html.

January 17–19
Virtual Symposium: Noise—Evaluation, Control, Assessment and Protection. Contact: www.aiha.org/DLProgram.

January 17–20
Oakland, California
ASP CIH Exam Workshop. Contact: www.bowenehs.com/details/8-asp-csp-exam-workshop.html.

January 18
San Antonio, Texas
Alamo Local Section: Tour of Bexar County Emergency Operations Center. Contact: www.aiha.org/LocalSections/html/alamo/index.htm.

January 18
Machine Safeguarding Risk Assessment: Achieving Acceptable Risk web course. CMs: 0.25; COCs: 0.15. Contact: www.zoubek consulting.com.

January 19–21
Mobile, Alabama
Respiratory Protection Programs. Contact: (205) 934-7178; dsc@uab.edu; www.uab.edu/dsc.

January 31–March 24
CIH Online Review. Contact: www.bowenehs.com/details/9-cih-online-review.html.

February 1
New Orleans, Louisiana
Laser Safety Officer course. CECs: 32; CMs: 4. Contact: www.rli.com/training/course.aspx?CourseID=5.

February 3
St. Paul, Minnesota
ASSE Northwest Chapter Annual Professional Development Conference. Contact: Chris Western; (612) 625-2443; cwestern@umn.edu; www.sph.umn.edu/ce/.

February 4
San Diego, California
Electrical Safety Standards course. BCSPs: 0.5; CEUs: 0.5; CMs: 0.84; COCs: 0.8. Contact: http://osha.ucsd.edu/index.cfm?vAction=singleCourse&tvCourse=FPM-40475.

February 7–8
Birmingham, Alabama
Spirometry Workshop. Contact: www.soph.uab.edu/dsc/Spirometry_Workshop_Feb2011.

February 7–9
Minneapolis, Minnesota
24-Hour Emergency Response Training. Contact: www.sph.umn.edu/ce/trainings/coursepage.asp?activityId=9858.

February 9–11
Birmingham, Alabama
Audiometric Testing and Hearing Conservation course. Contact: www.soph.uab.edu/dsc/AudiometricTesting_Mar2011.

February 10–12
Los Angeles, California
Musculoskeletal Disorders and Chronic Pain conference. Contact: www.cirpd.org/conference2011/content/home.cfm.

February 14–17
Tempe, Arizona
Industrial Hygiene Training course. BCSPs: 3.2; CECs: 3.2; CEUs: 3; CMs: 4.34. Contact: http://osha.ucsd.edu/index.cfm?vAction=singleCourse&tvCourse=FPM-40296.

February 15
TeleWeb: The Fundamentals of Chemical Protective Clothing. Contact: www.aiha.org/teleweb.

February 23
Austin, Texas
Aesthetic Laser Safety Officer. Contact: www.rli.com/training/course.aspx?CourseID=35.

February 24–26
Mesa, Arizona
2011 Annual Hearing Conservation Conference: "The Future of Hearing Conservation: Innovation and Technology." Contact: www.hearingconservation.org.

February 25
Loma Linda, California
Medical Laser Safety Officer. CEUs: 14. Contact: www.rli.com/training/course.aspx?CourseID=18.

February 28–March 2
Indianapolis, Indiana
2011 Indiana Safety and Health Conference and Expo. Contact: (800) 824-6885; www.insafetyconf.com.

March 2
Peoria, Illinois
Downstate Illinois 20th Annual Occupational Safety and Health Day. Contact: www.dioshday.com.

March 15
TeleWeb: Exploring GHS Implementation: Where Are We Today? www.aiha.org/teleweb.

March 21–24
Boston, Massachusetts
Analyzing Risk: Science, Assessment, and Management. Contact: (617) 384-8692; contedu@hsph.harvard.edu; www.hsph.harvard.edu/ccpe/webbrochures/RCC0511_WB.pdf.

March 28–April 1
Ann Arbor, Michigan
Comprehensive Industrial Hygiene Review. CEUs: 3.6; CMs: 5.0; COCs: 36. Contact: www.aiha.org/EDUCATION/CE/ROADCOURSES/Pages/CIHReview.aspx.

April 4–May 26
ASP CSP Online Review. Contact: www.bowenehs.com/details/10-asp-csp-online-review.html.

April 7
Opelika, Alabama
Occupational Exposure Assessment: Data Interpretation and Professional Judgment. Contact: www.soph.uab.edu/dsc/Occupational_Exposure_Assessment_April2011.

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VeriFit Irritant Smoke Generator for Respirator Fit Testing

Nextteq's VeriFit Irritant Smoke Generator revolutionizes respirator fit testing. Its patented design integrates all components into one convenient device. Plastic construction eliminates danger from broken glass. Small bellows minimize overexposure. Each VeriFit Irritant Smoke Generator is a complete, safe, ready-to-use, OSHA-compliant fit testing kit. Contact Nextteq at (877) 312-2333 or www.nextteq.com.

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OHD Quantifit
Respirator Fit Tester

Introducing the OHD Quantifit—the new gold standard in respirator fit testing. Includes on-board storage, keyboard and printer connections, and a simpler user interface. It's smaller, lighter and quieter. Upgrade your respirator program with the fastest and most accurate method available. The best just got better!

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RAECO
TSI PortaCount Pro Respirator Fit Tester

TSI PortaCount Pro quantitative respirator fit testers measure fit while users perform a series of moving, breathing and talking exercises to meet OSHA, NFPA and ANSI respiratory protection standards. Models available to rent on a daily, weekly, or monthly basis. Call 866-RENT-EHS (866-736-8347) for details.

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TSI Incorporated
Qfit™ Respirator Fit Tester

The Qfit™ Respirator Fit Tester is the only OSHA-compliant automated nebulizer for BITREX® and Saccharin to qualitatively test the integrity of respirators. The Qfit™ fit tester generates a consistent test agent with a pump-driven nebulizer utilizing pre-filled cartridges. The Qfit™ fit tester reduces solution clogging and minimizes repetitive stress disorders.

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To obtain further information on the listed products and companies, please circle the numbers on the fax-back card (p. 37) that correspond to the new products.

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April 2011
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January 2011

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1—Type of firm:
1 ❑ Manufacturer
2 ❑ Consultant
3 ❑ School/College
4 ❑ Hospital
5 ❑ Government

2—Professional function:
A ❑ Administration/Mgmt.
B ❑ Marketing/Sales
C ❑ Industrial Hygienist
D ❑ Physician
E ❑ Nurse
F ❑ Environ. Specialist
G ❑ Safety Specialist
H ❑ Health Specialist
I ❑ Res./Development
J ❑ Purchasing Agent

3—Purchasing authority:
1 ❑ Recommend
2 ❑ Specify
3 ❑ Approve

4—Number of employees:
A ❑ Under 100
B ❑ 100 to 500
C ❑ 500 to 1,000
D ❑ Over 1,000

5—This inquiry is for:
A ❑ Immediate Purchase
B ❑ Future Project

6—This issue is addressed to:
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B ❑ Someone else

7—Please have a salesperson contact me
A ❑ Yes B ❑ No

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C ❑ Direct Read. Equipment
D ❑ Respiratory Protection
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I ❑ Safety Equipment
J ❑ Asbestos Abatement
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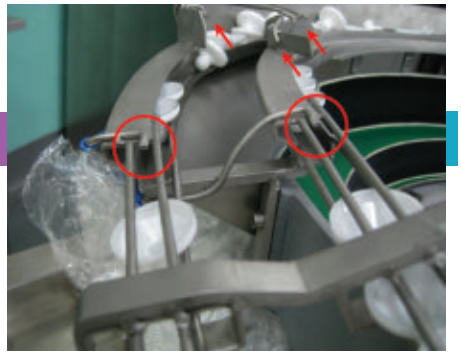
Case Study



Feasible and Effective Noise Control

BY DENNIS P. DRISCOLL

OSHA's proposed reinterpretation of "feasible" noise controls to mean those that are "capable of being done" would require employers to do everything short of going out of business to control noise exposures. One noise source likely to be in OSHA's crosshairs is compressed air. In my 30-plus years' experience in noise control, I've observed that compressed air is typically responsible for at least 30 percent of noise problems in manufacturing plants.

Pneumatic systems, such as air valves, cylinders and/or solenoids, use compressed air to power equipment. These devices generate high noise due to air discharge and/or excessive pressure settings. Compressed air nozzles are commonly used in production tasks, such as ejecting product or parts, moving parts along sorter bowl tracks, evaporative cooling, drying, and closing flaps on corrugated containers. Some hand-held devices, such as air guns, wands, and brooms, also use compressed air. These pneumatic systems and devices can generate noise levels in excess of 100 dBA and are generally the most significant contributors to exposures above the permissible exposure limit (90 dBA).

Problem and Opportunity

Compressed air, in my experience, is the easiest source of excessive noise to remedy and represents the greatest potential for exposure reduction. In addition, companies often see return on their investment in less than a year.

When reducing noise from compressed air, consider the application of the air. Noise generated by air exhaust from air valves, cylinders, and solenoids is caused by turbulence due to mixing of gases with widely differing velocities. In most cases, high-velocity air is exhausted into the stationary air surrounding the equipment. The shearing action that occurs in the mixing regions results in noise radiation, where the intensity of the sound is proportional to the velocity of airflow raised to the eighth power. Therefore, the first step is to reduce the air velocity to the lowest setting needed for the equipment to function properly. This action alone saves money through energy conservation and minimizes wear and tear on the machinery.

If reducing air pressure does not provide enough attenuation, try relocating the discharge point away from typical worker locations.

If reducing air pressure is impractical or does not provide enough attenuation, try relocating the discharge point away from typical worker locations—for example, deep inside a machine's casing or into a manifold where it can be piped away and released in an unoccupied area. Another option is to install a pneumatic silencer. If the air is used to perform a service, as is the case for air guns or wands, quiet-design nozzles are available for retrofit to open-ended air lines or for replacement of standard nozzles. Other practical options are available.

Costs

Attenuation of noise from compressed air has a relatively short-term payback. Consider a manufacturer that uses a series of vibratory sorter bowls as part of its product assembly process. Each bowl uses five open-ended air lines (such as those indicated in the photo above) to move parts around the tracks within the bowl. The total open area is equivalent to a 10 mm diameter pipe. The air pressure is set to 5 bar (72.5 psig), which results in 185 Nm^3/hr passing through the open-ended lines. At an average cost of $0.015 per 1 Nm^3/hr and an estimated use time of 40 percent, this equates to 704 hours of consumption per year. Thus, the annual cost for the open pipe is $1,953.60 (185 Nm^3/hr × $0.015 × 704 hours).

A Silvent 705 quiet-design nozzle not only reduces the noise level by 20 dBA, it provides the same airflow service at only 95 Nm^3/hr for an annual cost of $1,003.20 per sorter bowl—a savings of $950 over the open pipe scenario. The Silvent 705 nozzle costs approximately $200, so the financial payback period for retrofitting five nozzles per bowl is approximately one year.

No-brainer

The use of compressed air systems is by far the primary source of noise in manufacturing plants. Fortunately, noise control for compressed air is relatively easy to accomplish, often saves energy, and yields short-term return on investment. This is a no-brainer, folks.

Dennis P. Driscoll, PE, is principal consultant at Associates in Acoustics, Inc. He can be reached at (303) 670-9270 or DDriscoll@AssociatesInAcoustics.com.

Send your ideas for Synergist *case studies to synergist@aiha.org.*

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- Optimize respirator fit with real-time fit factor mode
- Avoid repeat fit testing
- OSHA compliant
- Fit test all types of respirators
- Easy to use, automated fit testing
- Paperless record keeping and documentation

TSI has recently launched the new PortaCount Academy, a new educational tool for the respirator fit testing world. By enrolling in the PortaCount Academy participants are able to choose from a variety of interactive learning methods. **Visit www.tsi.com/PCAcademy** for more information.

For more information contact TSI at 800-874-2811 or visit www.tsi.com/IHPC

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