

## Hazardous Substances

### OSHA, NIOSH Issue Countertop Silica Hazard Alert

#### Special Interest Articles:

- [Fatigue](#)
- [Mold Spores](#)
- [Engineering Controls](#)
- [iOS Apps](#)
- [Chrome Alternative](#)

DOEHRS Super Star

OSHA and NIOSH have issued a hazard alert about protecting workers from silica exposure during countertop manufacturing and installation, a very common residential remodeling project.

Their alert warns about "significant crystalline silica exposure during manufacturing, finishing, and installing natural and manufactured stone countertops."

Their news release says the alert "follows reports of 46 workers in Spain and 25 workers in Israel who developed silicosis – an incurable, progressively disabling and sometimes fatal lung disease – as a result of exposure to crystalline silica in their work manufacturing stone countertops. Ten of the workers in Israel required lung transplants as a result of their condition."

Read more:

<http://ohsonline.com/articles/2015/02/19/countertop-silica-hazard.aspx>



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## Tracking Alternative Flame Retardants: Hand-to-Mouth Exposures in Adults

Since polybrominated diphenyl ether (PBDE) flame retardants were withdrawn from use in polyurethane foam padding, alternatives including tris(1,3-dichloropropyl) phosphate (TDCIPP) and triphenyl phosphate (TPHP) are now used in consumer goods including furniture, automobiles, carpet padding, and baby products.<sup>1,2,3,4</sup> Like PBDEs, these replacement compounds have been widely found in dust samples from homes, offices, and vehicle interiors.<sup>2,3,4</sup> A new study in this issue of EHP examines whether they also resemble PBDEs in another way: the routes by which people are exposed.<sup>5</sup>



**Pool-fire**  
(Standard FR PU Foam)

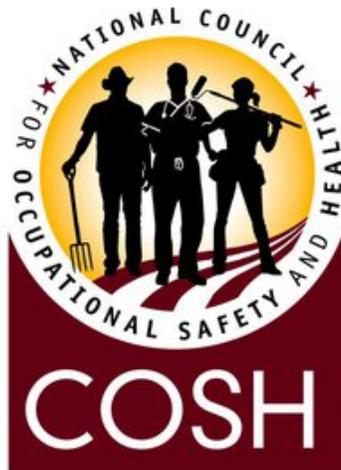


**No Pool-fire**  
(PU Foam+ Carbon Nanofibers)

Read more:

<http://ehp.niehs.nih.gov/123-A44/>

## Groups Seek Changes in OSHRC Procedures



The National Council for Occupational Safety and Health (National COSH) and allied organizations recently filed a petition before the U.S. Occupational Safety and Health Review Commission (OSHRC), calling for more worker and public participation in the commission's proceedings. The



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petition lists three changes it seeks:

- Expand OSHRC's definition of "affected employee," saying the definition is too narrow because multi-employer work sites and the use of contract, leased, or temporary employees are increasingly common in many industries, not just construction.
- Clarify that an employee may designate any person as his or her representative.

- Narrow the scope of confidentiality during settlement proceedings.

*Read more:*

<http://ohsonline.com/articles/2015/02/02/groups-seek-changes-in-oshrc-procedures.aspx?admgarea=news>

### OSHA-NIOSH Guidance Addresses Fatigue Among Ebola Healthcare Workers

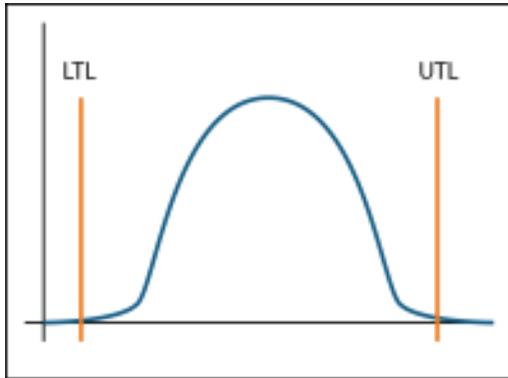
The National Institute for Occupational Safety and Health and OSHA have published a new guidance document, "Preventing Worker Fatigue Among Ebola Healthcare Workers and Responders" (\*PDF). Healthcare workers and emergency responders are often required to work extended, rotating, consecutive or otherwise unusual shifts. They also need enhanced personal protective equipment when working with Ebola patients or in Ebola-contaminated areas. These conditions increase the risk of injuries and can contribute to poor health and worker fatigue. The new guidance document provides information for protecting workers in these conditions.



*Read more:*

<https://www.osha.gov/as/opa/quicktakes/qt011515.html#8>

## “Quasi NonParametric” Upper Tolerance Limits for Occupational Exposure Evaluations



Upper Tolerance Limits (UTLs) are often used in comparing exposure datasets with an Occupational Exposure Limit (OEL) or other Regulatory Criterion (RC): if the 95%-95% UTL does not exceed the OEL, one is 95 percent confident that at most 5 percent of exposures exceed the OEL, and the

comparison “passes”. The largest of 59 observations is a Nonparametric (distribution-free) 95%-95% UTL (NPUTL); the chance that this largest value equals or exceeds the actual 95th percentile is at least 95 percent, regardless of the underlying data distribution. That many observations may seem excessive in clean environments or small studies, though, and one would like to “pass” using UTLs based on fewer observations sufficiently far below the OEL or RC.

*Read more: Journal of Occupational and Environmental Hygiene author version posted online: 2 Dec 2014 (Available with AIHA membership)*

## Structural Firefighting Ensembles - Accumulation and Off Gassing of Combustion Products

Firefighters may be exposed to toxic combustion products not only during firefighting operations and training, but also afterwards as a result of contact with contaminated structural firefighting ensembles. This study characterised the deposition of polycyclic aromatic hydrocarbons (PAHs) onto structural firefighting ensembles and off-gassing of combustion products from ensembles after multiple exposures to hostile structural attack fire environments. A variety of PAHs were deposited onto the outer layer of structural firefighting ensembles, with no variation in deposition flux between new



ensembles and already contaminated ensembles. Contaminants released from ensembles after use included volatile organic compounds, carbonyl compounds, low molecular weight PAHs, and hydrogen cyanide. Air samples collected in a similar manner after laundering of ensembles according to manufacturer specifications indicated that laundering returns off-gassing concentrations of most of the investigated compounds to pre-exposure levels. These findings suggest that contamination of firefighter protective

clothing increases with use, and that storage of unlaundered structural firefighting ensembles in small, unventilated spaces immediately after use may create a source of future exposure to toxic combustion products for firefighting personnel.

*Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 27 Jan 2015 (Available with AIHA membership)*

### Exposure to Crystalline Silica at Alberta Work Sites: Review of Controls



From 2009 to 2013, Alberta Jobs, Skills, Training and Labour (JSTL) conducted a project to evaluate exposure to crystalline silica and assess controls to protect workers. Information on exposure results has been previously reported; this paper discusses the data collected on workplace controls.

Information on work site controls was collected during exposure assessments consisting of qualitative information on controls in place and used by workers at the time of the assessments. Where there was sufficient detail, the information was further analyzed to evaluate the impact of a particular control.

While many types of controls were observed, they were not always effective or in use. The control available most often was respiratory protective equipment. Generally, when respirators were used, they were correctly selected for the level of measured exposure. However, not all workers who were potentially over-exposed wore respirators at the time of the assessments. When the use of respirators was taken into account, about one third of workers were still potentially exposed over the Alberta occupational exposure limit.

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The industries with the highest levels of exposure tended to be those with the most unprotected workers. Issues were identified with the use of improper work practices such as dry cleaning methods, lack of documented work procedures, poor housekeeping and lack of training which may have contributed to worker exposure levels.

There is a wide range in the efficacy of controls, particularly engineering controls. Most of the literature focuses on engineering controls; however administrative controls also play a role in reducing worker exposure. Data collected in this work indicated that simple changes to work procedures and behavior (such as

improved housekeeping) may be effective, low-cost ways to reduce workplace exposure. More study is required to evaluate the impact and efficacy of administrative controls such as housekeeping and training. Employers must select and evaluate controls in the context of overall workplace health and safety programs and ensure that they are supported by supervision, good work practices and training.

*Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 27 Jan 2015 (Available with AIHA membership)*

### **Oxycide Is Supposed to Make Hospitals Cleaner and Safer for Patients, but What about the Staff That Has to Use It?**

When Robert Ross has to use the cleaning solution OxyCide as part of his job as a housekeeping employee at UPMC Magee-Women's Hospital, it's not a pleasant experience.

"It burns my eyes, it makes them water. It burns my throat," says Ross. "The best way to describe it is it's like working with onions. You have no relief, unless you take a break and go some place that's well ventilated so you can get some air."

OxyCide, a relatively new hospital-cleaning product, was selected as the primary cleaning solution in nearly 20 UPMC facilities last spring. Since that time, some employees say they and their co-workers



have experienced a number of adverse side effects when using the product.

*Read more:*  
<http://www.pghcitypaper.com/pittsburgh/oxycide-is-supposed-to-make-hospitals-cleaner-and-safer-for-patients-but-what->

[about-the-staff-that-has-to-use-it/Content?oid=1807185](#)

## **Inactivation of Mold Spores from Moist Carpet Using Steam Vapor: Contact Time and Temperature**



Steam vapor has been shown to reduce viable mold spores in carpet, but the minimal effective temperature and contact time has not been established. This study evaluated the effectiveness of steam vapor in reducing the number of viable mold spores in carpet as a function of temperature and contact time. Seventy carpet samples were inoculated with a liquid suspension of *Cladosporium sphaerospermum* and incubated over a water-saturated foam carpet pad for 24-hours. Steam was applied to the samples as the temperature was measured from the carpet backing. Contact time was closely monitored over seven time intervals: 0, 2, 4, 8, 12, 16, and 20 seconds. Following steam

vapor treatment, mold spores were extracted from the carpet samples and the extract was plated on DG-18 plates at 1:1, 1:10, 1:100 dilutions followed by one week of incubation. Raw colony forming units were determined using an automated colony counter and adjusted based on dilution factor, extraction volume, and plated volume. Analysis of variance and linear regression were used to test for statistically significant relationships. Steam contact time exhibited a linear relationship to observed temperature of carpet backing ( $F=90.176$ ,  $R^2=0.609$ ). Observed temperature of carpet backing had a positive relationship to percent reduction of mold ( $F=76.605$ ,  $R^2=0.569$ ). Twelve seconds of steam vapor contact time was needed to achieve over 90% mold reduction on moist carpet.

*Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 27 Jan 2015 (Available with AIHA membership)*

## **Comparison of Hydrogen Peroxide and Peracetic Acid as Isolator Sterilization Agents in a Hospital Pharmacy**

**Purpose:** The efficacy of hydrogen peroxide and peracetic acid as isolator sterilization agents was compared.

**Methods:** Sterilization and efficacy tests were conducted in a flexible 0.8-m<sup>3</sup> transfer isolator using a standard load of

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glass bottles and sterile medical devices in their packing paper. *Bacillus stearothermophilus* spores were placed in six critical locations of the isolator and incubated at 55 °C in a culture medium for 14 days. Sterilization by 4.25 mL/m<sup>3</sup> of 33% vapor-phase hydrogen peroxide and 12.5 mL/m<sup>3</sup> of 3.5% peracetic acid was tested in triplicate. Sterility was validated for hydrogen peroxide and peracetic acid at 60, 90, 120, and 180 minutes and at 90, 120, 150, 180, 210, and 240 minutes, respectively.

Results: In an efficacy test conducted with an empty isolator, the sterilization time required to destroy *B. stearothermophilus* spores was 90 minutes for both sterilants, indicating that they have comparable bactericidal properties. During the validation test with a standard load, the sterilization time using hydrogen peroxide was 150 minutes versus 120 minutes with peracetic acid. The glove cuff was particularly difficult for hydrogen peroxide to sterilize, likely due to its slower diffusion time than that of peracetic acid. Hydrogen



peroxide is an environmentally safer agent than peracetic acid; however, its bacteriostatic properties, lack of odor, and poor diffusion time may limit its use in sterilizing some materials.

Conclusion: Hydrogen peroxide is a useful alternative to peracetic acid for isolator sterilization in a hospital pharmacy or parenteral nutrition preparation unit

*Read more:*

<http://www.medscape.com/viewarticle/524500>

## Direct Reading Particle Counters: Calibration Verification and Multiple Instrument Agreement via Bump Testing

The calibration records of two direct reading instruments designated as condensation particle counters were examined to determine the number of times they were found to be out of tolerance at annual manufacturer's recalibration. Both instruments were found to be out of tolerance more times than

within tolerance. And, it was concluded that annual calibration alone was insufficient to provide operational confidence in an instrument's response. Therefore, a method based on subsequent agreement with data gathered from a newly calibrated instrument was developed in order to confirm operational readiness between annual calibrations; hereafter referred to as

bump testing. The method consists of measuring source particles produced by a gas grille spark igniter in a gallon size jar. Sampling from this chamber with a newly calibrated instrument to determine the calibrated response over the particle concentration range of interest serves as a reference. Agreement between this reference response and subsequent responses at later dates implies that the instrument is performing as it was at the time of calibration. Side-by-side sampling allows the level of agreement between two or more instruments to be determined. This is useful when simultaneously collected data is compared for differences, i.e., background with process aerosol concentrations.

A reference set of data was obtained using the spark igniter. The generation system was found to be reproducible and suitable to form the basis of calibration verification. The bump test is simple enough to be performed periodically throughout the calibration year, or prior to field monitoring.

*Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 27 Jan 2015 (Available with AIHA membership)*

### Radiation

#### Fact-Finding Survey in Response to the Manipulation of Personal Alarm Dosimeter Collection Efficiency: Lessons Learned About Post-Emergency Radiation Protection from the TEPCO Fukushima Daiichi APP Accident



During emergency work at TEPCO Fukushima Daiichi Atomic Power Plant on 1 December 2011, a subcontractor demanded that its contracted workers cover their personal alarm dosimeters (PAD) with 3 cm thick lead plates to lower dosimeter readings. As a response, the MHLW conducted a fact-finding survey to identify similar cases and devise measures to prevent a recurrence of this incident. To screen the suspected cases, the Ministry of Health, Labour and Welfare (MHLW) extracted a) cases in which a PAD reading

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was at least 15 % higher than the reading obtained from a radio-photoluminescence dosimeter (RPD), where the dose was greater than 5 mSv in a month (1,813 data points) and b) dose data in which PAD readings were less than 50 % of the expected dose, where exposure dose may exceed 1 mSv in a day (56 workers, 17,148 data points). From these screenings, the MHLW identified 50 instances from TEPCO and 9 primary contractors, including 4 general contractors, 2 plant manufacturers and 3 plant maintenance companies, as the subject of the due diligence study of exposure data, including interviews. The results of the survey provide lessons that can also be applied to transition from emergency radiation protection to normal operation, as the application of emergency dose limits had ceased on 16 December 2011 in the affected plant. Based on the

results of the survey, the MHLW provided administrative guidance documents to TEPCO and 37 primary contractors. The major points of these documents include a) identification of recorded dose values by comparison of PAD readings to RPD readings, b) storage and management of RPDs and control badges, c) circulation management of PADs and access control to the affected plant, d) estimation of planned doses and setting of alarm values of PADs, e) actions to be taken by contractors if worker dose limits are reached and f) physical measures to prevent recurrence of the incident.

*Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 23 Jan 2015 (Available with AIHA membership)*

### Application of a Two-Zone Model to Estimate Medical Laser Generated Particulate Matter Exposures



We estimated particulate matter exposures for two simulated medical laser procedures using a near-field/far-field model. Size-specific mass emission rates obtained from

a laboratory-based emission chamber study were used with estimated room size, air exchange rate and interflow between zones to demonstrate the potential exposure range. Modeled steady-state concentrations for the near-field ranged between 80 and 2140  $\mu\text{g}/\text{m}^3$  and between 40 and 1650  $\mu\text{g}/\text{m}^3$  in the far-field. Results indicate concentrations in the simulated scenarios are similar to those obtained from limited field assessments conducted in hospital operating rooms. Since new medical laser technologies and applications continue to grow, modeled occupational exposures of medical laser generated

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particulate matter can be useful in better understanding these exposures in the clinical environment, and to inform control strategies.

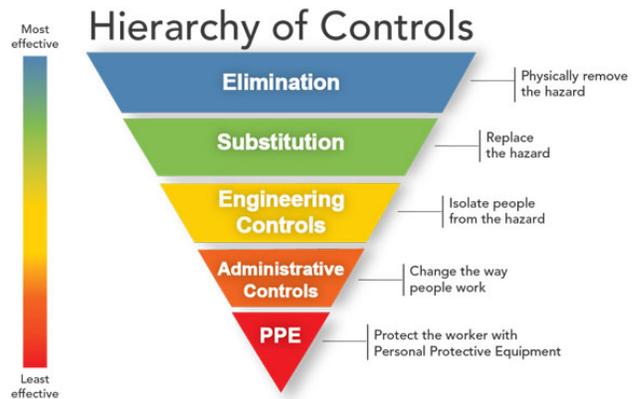
*Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 26 Jan 2015 (Available with AIHA membership)*

## Ventilation

### New NIOSH Web Page Focuses on Engineering Controls

A new NIOSH Web page collects resources, tools, and information related to engineering controls, including a list of hazards where engineering controls are effective and a list of related topic pages. Users can also find relevant NIOSH publications and blog posts that discuss engineering controls.

The Web page includes information about the NIOSH Engineering Controls Research Program, which leads the agency's engineering control efforts. According to NIOSH, current activities include planning and conducting research on engineering control technology; promoting the application of effective engineering control technology; formulating effective and credible workplace standards; and providing consultation in the application of effective control solutions.



*Read more:*

<https://www.aiha.org/publications-and-resources/TheSynergist/Industry%20News/Pages/New-NIOSH-Web-Page-Focuses-on-Engineering-Controls.aspx>

**PPE**

**A Perfect Romance: A Valentine’s Day Guide to the Necessary  
Considerations of CBRN APR Use**



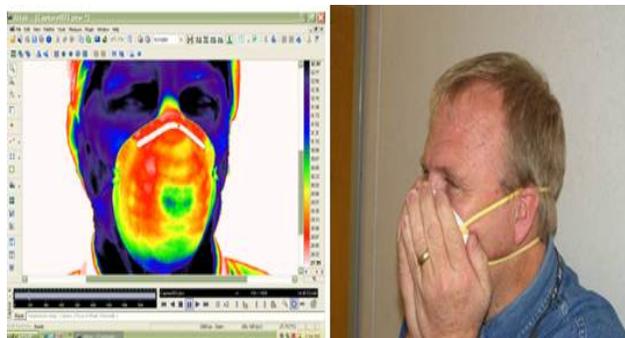
Chemical, Biological, Radiological, and Nuclear ... no, we’re not talking about our plans for Valentine’s Day. For the last few years NIOSH has celebrated this romantic holiday by showing a little love for respirators. This year we are highlighting the special considerations necessary for the

use of CBRN APRs (Chemical, Biological, Radiological, and Nuclear Air-Purifying Respirators). Please note that a respiratory protection program administrator should always ensure that manufacturer recommendations are being addressed and applicable regulations are followed in addition to the NIOSH Cautions and Limitations of use. APR wearers should also be trained to fully understand and appreciate the unique characteristics of the CBRN APRs in order to obtain optimal protection during use.

Read more: <http://blogs.cdc.gov/niosh-science-blog/2015/02/13/valentines2015/>

**Potential Role of Infrared Imaging for Detecting Facial Seal Leaks in  
Filtering Facepiece Respirator Users**

Infrared imaging (IRI) can detect airflow through and near respirator masks based upon temperature differences between ambient and exhaled air. This study investigated the potential usefulness of IRI for detecting leaks and providing insight into the sites and significance of leaks. METHODS: Subjects (n=165) used filtering facepiece N95 respirators (N95 FFR) in the course of a research study concerning



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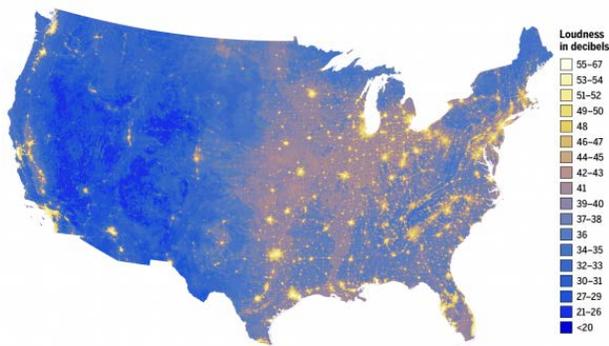
training modalities. Short sequence video infrared images were obtained during use and with intentionally introduced facial seal leaks. Fit factor (FF) was measured with condensation nuclei count methods (PortaCount). IRI detected leaks were scored on a four-point scale and summarized as the Total Leak Score (TLS) over 6 coding regions and the presence or absence of a “Big Leak (BL)” in any location. A semi-automated interpretation algorithm was also developed. RESULTS: IRI detected leaks are particularly common in the nasal region, but these are of limited significance.

IR imaging could effectively identify many large leaks. The TLS was related to FF. Although IRI scores were related to FF, the relationship is insufficiently close for IRI to substitute for quantitative fit testing. IMPLICATIONS: Infrared techniques have potential for identifying situations with very inadequate respiratory protection using FFR's.

*Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 27 Jan 2015 (Available with AIHA membership)*

## Noise

### New Map Shows America's Quietest Places



Craving some silence? Head (quietly) toward the blue regions on the map above. Based on 1.5 million hours of acoustical monitoring from places as remote as Dinosaur National Monument in Utah and as urban as New York City, scientists have created a map of noise levels across the

country on an average summer day. After feeding acoustic data into a computer algorithm, the researchers modeled sound levels across the country including variables such as air and street traffic. Deep blue regions, such as Yellowstone National Park in Wyoming and the Great Sand Dunes National Park in Colorado, have background noise levels lower than 20 decibels—a silence likely as deep as before European colonization, researchers say.

*Read more:*  
<http://news.sciencemag.org/environment/2015/02/new-map-shows-americas-quietest-places>

## **A Bodyguard for Your Ears: Scientists Discover Novel Pain Sensors in Inner Ear that Warn of Dangerously Loud Noise**

Our hearing has a secret bodyguard, a newly discovered connection from the cochlea to the brain that warns of intense incoming noise that causes tissue damage and hearing loss. Scientists believe it's the ear's novel pain system designed to protect it from dangerous noise. Because the ear doesn't have the nerve cells that normally detect pain, it needs its own alert system. The findings could usher new treatments for painful hearing conditions like tinnitus and hyperacusis.



*Read more:*

<http://www.sciencedaily.com/releases/2015/02/150218123058.htm>

### ***Preventive Medicine***

## **New Report Highlights Ways to Improve Work-Related Cancer Prevention**



EU-OSHA has released a report that gives recommendations for filling gaps in

knowledge regarding work-related cancer as a response to World Cancer Day. This year's World Cancer Day focused on detection, treatment, and care.

The report concentrates on the assessment of carcinogens and work-related cancer by attempting to describe carcinogens and cancer-causing conditions in the workplace, evaluate sources of information and identify knowledge gaps, give recommendations for filling these gaps, and describe prevention measures.

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Read more:

<http://ohsonline.com/articles/2015/02/05/>

[new-report-highlights-ways-to-improve-work.aspx?admgarea=news](http://new-report-highlights-ways-to-improve-work.aspx?admgarea=news)

## Infectious-Disease Programs Fare Well In Obama's 2016 Budget

In releasing its proposed 2016 budget yesterday, the Obama administration offered an array of generous increases in infectious-disease (ID)-related programs, and seasoned them with a suggestion to unify federal food safety activities under one agency, a long-discussed idea that has never gained traction in Congress.

The budget plan has drawn mostly cheers from public health and medical groups, with a big boost in funds to fight antimicrobial resistance getting an especially warm response.

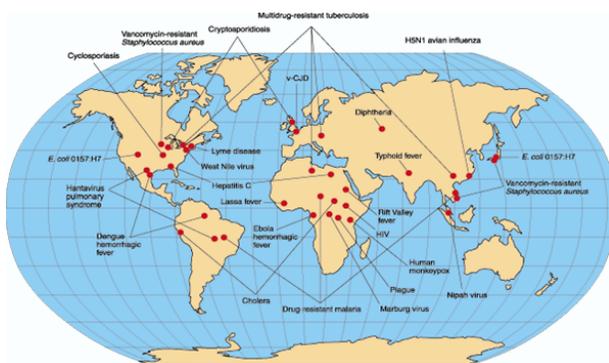
Read more:

<http://www.cidrap.umn.edu/news->



[perspective/2015/02/infectious-disease-programs-fare-well-obamas-2016-budget](http://perspective/2015/02/infectious-disease-programs-fare-well-obamas-2016-budget)

## Climate Change May Be Helping Infectious Diseases Spread to New Places and Hosts



Infectious disease outbreaks such as Ebola have constantly been a major threat to

public health, and they're likely to become a bigger problem in the future. According to an opinion piece in Philosophical Transactions of the Royal Society B , infectious diseases are spreading to new places and new hosts—including humans—with the help of climate change.

Read more:

<http://www.popsci.com/zoologists-link-increased-infectious-diseases-climate-change?dom=psc&loc=contentwell&lnk=cli>

[mate-change-may-be-helping-infectious-diseases-spread-to-new-places-and-hosts](#)

## **How Much Sleep Do You Really Need?**

Loyola University Chicago Stritch School of Medicine researcher Lydia DonCarlos, PhD, is a member of an expert panel that's making new recommendations on how much sleep people need.

The panel, convened by the National Sleep Foundation, is making its recommendations based on age, ranging from newborns (who need 14 to 17 hours of sleep per day) to adults aged 65 and up (7 to 8 hours per day).

In the new guidelines, there's a wider range of what constitutes a good night's sleep. For example, the expert panel recommends that teens (ages 14 to 17) get 8 to 10 hours of sleep per night. The previous guideline had a narrower recommended range of 8.5 to 9.5 hours per night.



*Read more:*

<http://www.enn.com/lifestyle/article/48255>

## **Autoimmune Disease Risk Found Related to Mercury Exposure**

One of the greatest risk factors for autoimmunity among women of childbearing age may be associated with exposure to mercury such as through seafood, a new University of Michigan study says.

The findings, which appear in Environmental Health Perspectives, found that mercury - even at low levels generally considered safe - was associated with autoimmunity. Autoimmune disorders,



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which cause the body's immune system to attack healthy cells by mistake, affects nearly 50 million Americans and predominately women.

Read more:

<http://www.enn.com/pollution/article/48249>

## Climate Change May Affect Tick Life Cycles, Lyme Disease



States, which could increase transmission among animals – and ultimately humans – of certain pathogens, including the bacterium that causes Lyme disease.

Other colder regions of the country that have sufficient populations of blacklegged ticks – particularly Wisconsin and Minnesota – may also experience a higher risk of Lyme disease. However, the changing life cycles of the ticks may result in a less-likely probability of transmitting a more deadly pathogen that results in Powassan encephalitis, the researchers say.

Read more:

<http://www.enn.com/wildlife/article/48266>

A new study suggests that changing climate patterns may be altering the life cycles of blacklegged ticks in the northeastern United

## Environmental Health

### DoD Study Identifies Models and Data Required to Support Climate Vulnerability and Impact Assessments

A new report issued by SERDP reviews models and data needed to support climate change vulnerability and impact assessments of infrastructure assets located at military installations. The SERDP report

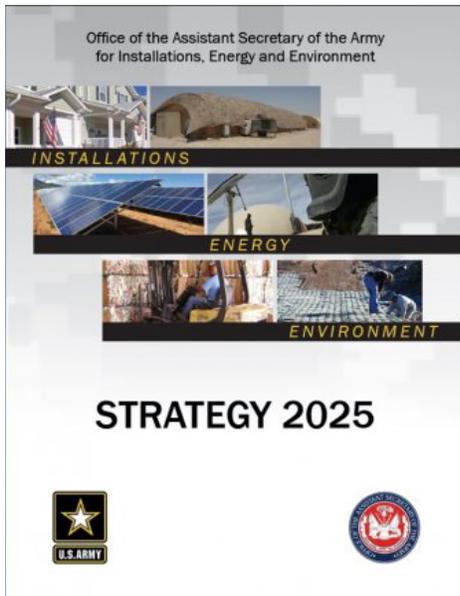


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Infrastructure Damage/Fragility Models and Data Quality Issues Associated with Department of Defense Climate Vulnerability and Impact Assessment assesses the availability, quality, and usefulness of two types of information to support assessments: (1) damage and fragility information, and (2) topographic, bathymetric, and infrastructure asset data..

Read more: <https://www.serdp-estcp.org/News-and-Events/Blog/DoD-Study-Identifies-Models-and-Data-Required-to-Support-Climate-Vulnerability-and-Impact-Assessments>

## Army Releases Vision and Strategy for Installations, Energy and Environment Through 2025



The Office of the Assistant Secretary of the Army for Installations, Energy and Environment, or OASA (IE&E), released the Army's vision and strategy through 2025 to

help meet future challenges and succeed in future operating environments.

OASA (IE&E) Strategy 2025 is important, as it serves to guide and shape the Army's future and current actions related to Installations, Energy and Environment, as well as provide the strategic roadmap to achieve its vision.

In the OASA (IE&E) Strategy 2025 foreword, Assistant Secretary of the Army (IE&E) Katherine Hammack, explained the importance of the strategy for the Army.

Read more: [http://www.army.mil/article/140400/Army\\_releases\\_vision\\_and\\_strategy\\_for\\_installations\\_energy\\_and\\_environment\\_through\\_2025/](http://www.army.mil/article/140400/Army_releases_vision_and_strategy_for_installations_energy_and_environment_through_2025/)

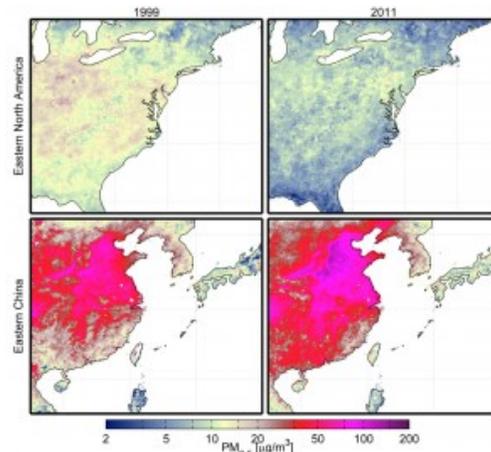
## The View from Afar: Satellite-Derived Estimates of Global PM2.5

More than 3 million people died prematurely in 2010 due to ambient exposure to fine particulate matter (PM2.5),

according to estimates from the Global Burden of Disease Study.<sup>1</sup> Although air pollution measurements taken from

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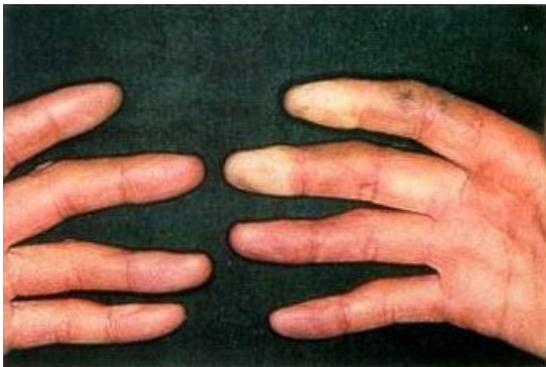
ground-level monitors can help inform such estimates, a paucity of monitoring stations outside of North America and Western Europe make it difficult to compare levels and trends in PM<sub>2.5</sub> and their health effects around the world.<sup>2</sup> Fortunately, satellite data provide a way of filling in data gaps for areas with no ground-based monitoring. In this issue of EHP, a team of researchers report their satellite-derived estimates of global exposure trends to PM<sub>2.5</sub> over 15 years.<sup>3</sup>



Read more: <http://ehp.niehs.nih.gov/123-A43/>

## Ergonomics

### Vibration Hazards in the Workplace: The Basics of Risk Assessment



Every day, much time and effort is spent on measuring vibration levels in factories, vehicles, buildings, and on other structures and machines—even products as diverse as computer hard drives and spacecraft as they are being designed, developed, and tested. Thousands of engineers,

technicians, consultants, and machine designers have become expert when it comes to measuring how physical objects are affected by vibration. Yet an astonishingly small percentage of this expertise is focused on how vibration in the workplace causes serious injury in humans—injuries that could have been prevented with the right amount of knowledge and the application of a few simple guidelines

Read more: <http://ohsonline.com/articles/2015/02/02/vibration-hazards.aspx?admgarea=news>

### Whole-Body Vibration Exposure Intervention among Professional Bus and Truck Drivers: a Laboratory Evaluation of Seat-Suspension Designs

Long-term exposure to seated whole-body vibration (WBV) is one of the leading risk factors for the development of low back disorders. Professional bus and truck drivers are regularly exposed to continuous WBV, since they spend the majority of their working hours driving heavy vehicles. This study measured WBV exposures among professional bus and truck drivers and evaluated the effects of seat-suspension designs using simulated field-collected data on a vibration table. WBV exposures were measured and compared across three different seat designs: (1) an air-ride bus seat, (2) an air-ride truck seat, and (3) an electromagnetically active (EM-active) seat. Air-ride seats use a compressed-air bladder to attenuate vibrations, and they have been in operation throughout the transportation industry for many years. The EM-active seat is a relatively new design that incorporates a microprocessor-controlled actuator to dampen vibration.

The vibration table simulated seven WBV exposure scenarios: four segments of vertical vibration and three scenarios that used field-collected driving data on different road surfaces – a city street, a freeway, and a section of rough roadway. The field scenarios used tri-axial WBV data that had been collected at the seat pan and at the driver's sternum, in accordance with ISO 2631-1 and 2631-5.



This study found that WBV was significantly greater in the vertical direction (z-axis) than in the lateral directions (x and y axes) for each of the three road types and each of the three types of seats. Quantitative comparisons of the results showed that the floor-to-seat-pan transmissibility was significantly lower for the EM-active seat than for either the air-ride bus seat or the air-ride truck seat, across all three road types. This study also demonstrated that seat-suspension designs have a significant effect on the vibrations transmitted to vehicle operators, and the study's results may prove useful in designing future seat suspensions.

*Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 27 Jan 2015 (Available with AIHA membership)*

## An iOS Application for Evaluating Whole-Body Vibration within a Workplace Risk Management Process

Workplace management of whole-body vibration exposure requires systematic collection of whole-body vibration data in conjunction with the numerous variables which influence vibration amplitudes. The cost and complexity of commercially available measurement devices is an impediment to the routine collection of such data by workplaces. An iOS application has been developed which allows an iPod Touch to be used to measure whole-body vibration exposures. The utility of the application was demonstrated by simultaneously obtaining 98 pairs of whole-body vibration measurements from both the iPod Touch application and a commercially available whole-body vibration device during the operation of a variety of vehicles and mobile plant in operation at a surface coal mine. The iOS application installed on a 5th generation iPod Touch was shown to provide a 95% confidence of  $\pm 0.077$  m/s<sup>2</sup> r.m.s. constant error for the vertical direction. Situations in which vibration levels lay within the ISO2631.1 health guidance caution zone were accurately identified, and the qualitatively features of the frequency spectra were reproduced. The low cost and relative simplicity of the application has potential to facilitate its use as a screening tool to identify situations in

which musculoskeletal disorders may arise as a consequence of exposure to whole-body vibration.



*Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 27 Jan 2015 (Available with AIHA membership)*

*Safety*

## Cart-Mounted TEMTADS Field Ready for Munitions Response



An innovative sensor system, demonstrated in a series of ESTCP-funded studies, could save DoD billions of dollars by dramatically increasing the efficiency of munitions response actions at former testing and training ranges around the country.

In a traditional remedial action for munitions, the site is mapped using a metal detector and the locations of all detections are investigated by digging. In most cases, less than 1% of the detections are

munitions – the overwhelming majority of metal detections are from fragments of munitions that detonated, parts of targets, and other debris that may not even be from military activities, such as wire, nails, and horseshoes. Thus, this method expends a significant fraction of resources digging up metal scrap or other items that turn out not to be hazardous. Advanced electromagnetic induction sensors collect data that allows an analyst to determine properties of the buried metal objects that can be used to classify them as either munitions or not. Classification using these sensors has been shown to significantly reduce the cost of a munitions response.

Read more: <https://www.serdp-estcp.org/News-and-Events/Blog/Cart-Mounted-TEMTADS-Field-Ready-for-Munitions-Response>

## Heat Index and Adjusted Temperature as Surrogates for Wet Bulb Globe Temperature to Screen for Occupational Heat Stress

Ambient temperature and relative humidity are readily available; and thus tempting metrics for heat stress assessment. Two methods of using air temperature and relative humidity to create an index are Heat Index and Adjusted Temperature. The

purposes of this paper were: (1) to examine how well Heat Index and Adjusted Temperature estimated the wet bulb globe temperature (WBGT) index; and (2) to suggest how Heat Index and Adjusted Temperature can be used to screen for heat

## Army Industrial Hygiene News and Regulatory Summary

stress level. Psychrometric relationships were used to estimate values of actual WBGT for conditions of air temperature, relative humidity, and radiant heat at an air speed of 0.5 m/s. A relationship between Heat Index [°F] and WBGT [°C] was described by  $WBGT = -0.0034 HI^2 + 0.96 HI - 34$ . At lower Heat Index values, the equation estimated WBGTs that were  $\pm 2$  °C-WBGT around the actual value; and to about  $\pm 0.5$  °C-WBGT for Heat Index values  $> 100$  °F. A relationship between Adjusted Temperature [°F] and WBGT [°C] was described by  $WBGT = 0.45 T_{adj} - 16$ . The actual WBGT was between 1 °C-WBGT below the estimated value and 1.4 °C-WBGT above. That is, there was a slight bias toward overestimating WBGT from Adjusted Temperature.

Heat stress screening tables were constructed for metabolic rates of 180, 300, and 450 W. The screening decisions were divided into four categories: (1)  $<$  alert limit; (2)  $<$  exposure limit; (3) hourly time-weighted averages of work and recovery;

and (4) a Caution zone for an exposure  $>$  exposure limit at rest. The authors do not recommend using Heat Index or Adjusted Temperature instead of WBGT, but they may be used to screen for circumstances when a more detailed analysis using WBGT is appropriate. A particular weakness is accounting for radiant heat; and neither air speed nor clothing was considered.



*Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 23 Jan 2015 (Available with AIHA membership)*

### The Complacency Dilemma



There seems to be an upward trend in several industries to list "complacency" as a contributory cause on accident investigation reports. Many perception surveys now ask workers if they have

become complacent when doing repetitive jobs and if complacency is considered an undesirable characteristic of a safety culture. Although this attention to complacency is deserved, the standard solutions to improve it fall short of success in almost all instances. Complacency is a state of mind, which is not necessarily the only influence on safety choices or behaviors.

Read more:

<http://ehstoday.com/safety/complacency->

[dilemma](#)

## Loss of Heat Acclimation and Time to Re-establish Acclimation

Acclimation in a hot environment is one potent means to decrease the heat strain of work in a hot environment. However, with diminished heat exposure, positive adaptations of acclimation may be lost. This rate of loss is equivocal and, once established, could be used to prescribe the time for re-acclimation. The purpose of this study was to determine the rate of loss of heat acclimation over a period of 6 weeks and determine the time needed for re-acclimation after 2 weeks and 4 weeks of de-acclimation in ten healthy participants. All participants first underwent an initial acclimation period (a 3-day plateau in  $T_{re}$  was used to signify acclimation). Based on the mean time to acclimate in Phase 1 (mean time to acclimate =  $6.1 \pm 1.4$  days), the loss of acclimation was mapped and participants were randomly assigned to one of two groups: one that underwent one 2-hour heat exposure at 1,3 and 5 weeks post-acclimation, and one that underwent one 2-hour heat exposure session at 2,4 and 6 weeks. Complete loss of acclimation occurred in 6 weeks and, as expected work HR and  $T_{re}$  increased with increasing time away from the heat ( $p < 0.05$ ).

Based on the time for total loss of acclimation from Phase 1, participants in Phase 2 ( $n=8$ ) first underwent acclimation. Then, after either a 2-week or 4-week



absence from the heat, participants returned to the laboratory for re-acclimation. While not statistically significant yet practically significant ( $p=0.18$ ; one-tailed confidence interval), average days for re-acclimation in the 2-week group tended to be fewer than in the 4-week group (days for re-acclimation =  $3.8 \pm 1.2$  and  $5.3 \pm 1.9$ , respectively). Based on these general trends, for occupational settings, a re-acclimation period of 4 days is recommended after two weeks absence from the heat, 5 days for four weeks absence from the heat and complete acclimation (6 days) after 6 weeks absence or more from the heat.

*Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 26 Jan 2015 (Available with AIHA membership)*

## **FMCSA Creates Committee to Update Truck and Bus Driver Training**

The U.S. Department of Transportation's Federal Motor Carrier Safety Administration announced the formation of a 26-member advisory committee that is tasked with updating classroom and new behind-the-wheel training requirements for professional truck and bus drivers.

*Read more:*

<http://ohsonline.com/articles/2015/02/13/fmcsa-establishes-committee-to-update-truck-and-bus-driver-training.aspx?admgarea=news>



## **Meet the New Flame- Resistant Clothing: Multi-Hazard Protection**



OSHA does require the employer to protect the employee from the hazards present in the workplace. Every workplace must assess the needs of the workplace according to OSHA standards. In this assessment, winter wear and rainwear commonly are overlooked. In some climates this is more critical than others. On April 11, 2014, OSHA issued a final ruling on the OSHA 1910.269 standard, bringing rainwear and cold weather winter wear into the spotlight for electrical service personnel, especially at utilities and large industrials.

*Read more:*

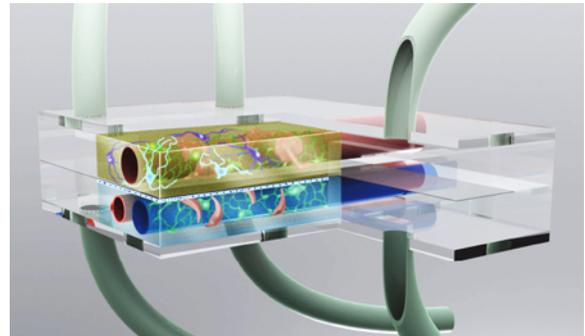
<http://ehstoday.com/protective-clothing/meet-new-flame-resistant-clothing-multi-hazard-protection>

Although OSHA doesn't have specific standards for cold weather winter wear,

***Emergency Preparedness & Response***

**Biodefense Aims to Simulate Human Bodies by Linking Mini "Organs"  
on Chips**

Each year, the US government spends hundreds of millions of dollars stockpiling countermeasures for potential biological, chemical and radiological warfare agents. For ethical reasons, many of these treatments have never been tested in humans. Now, the US military and civilian science agencies are supporting the development of the next best thing for tests: miniature human organs on plastic chips.



*Read more:*

<http://www.scientificamerican.com/article/biodefense-aims-to-simulate-human-bodies-by-linking-mini-organs-on-chips/>

**Depth and Rate of Chest Compressions during CPR Impact Survival in  
Cardiac Arrest**



The depth of chest compressions and the rate at which they were applied make a significant impact on survival and recovery of patients, a review of research by physicians shows.

Contrary to popular belief, the reviews showed that cardiopulmonary resuscitation (CPR) compressions deeper than 5.5 centimeters -- about two inches -- resulted in decreased survival, possibly because of collateral damage to other internal organs.



Read more:

<http://www.sciencedaily.com/releases/2015/02/150205155638.htm>

## New Devices May Soon Help Soldiers Nose Out Chemicals, Bio Threats

Researchers are refining for Army use a commercial technology that will allow Soldiers to accurately and rapidly detect an array of chemical and biological hazards - from mustard agent to anthrax - and then transmit those results to their higher command.

At the same time, the technology is smart enough to differentiate between those chemicals which are dangerous and those that the Soldier has carried with him into the environment on his own skin, such as bug spray or hand sanitizer.

The VOckit system is a small electronic device developed at the Army's Edgewood Chemical Biological Center, or ECBC, and even manufactured there, for now, on the center's 3D printers. The device reads the result of chemical detection paper and can

then transmit the results into the Army's network via the Soldier-worn "Nett Warrior" smartphone system.

Read more:

[http://www.army.mil/article/143059/New\\_devices\\_may\\_soon\\_help\\_Soldiers\\_nose\\_out\\_chemicals\\_bio\\_threats/](http://www.army.mil/article/143059/New_devices_may_soon_help_Soldiers_nose_out_chemicals_bio_threats/)



## Deployment Health

### Non-Battle Injuries Result In More Medical Evacuations than Combat



If you ask Soldiers what the biggest physical health threat they face while in the Army, only a portion are aware that it has nothing to do with warfighting.

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In fact, the primary health threat to troops for more than two decades has been common muscle, joint, tendon/ligament and bone injuries like knee or back pain that are caused by running, sports and exercise-related activities such as basketball and weightlifting.

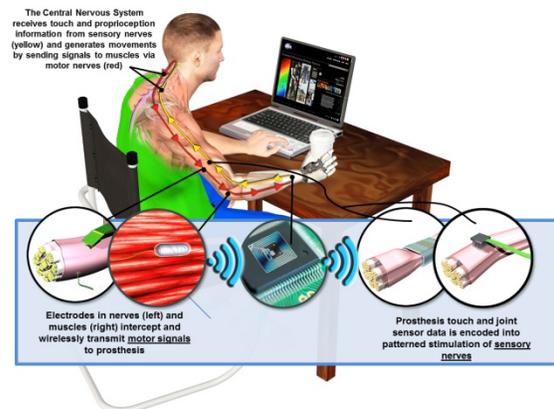
These activities are not just a primary cause of injuries in stateside locations, but also in deployed locations.

*Read more:*

<http://www.arl.army.mil/www/default.cfm?article=2551>

### HAPTIX Starts Work to Provide Prosthetic Hands with Sense of Touch

Despite recent advances in technology for upper-limb prostheses, artificial arms and hands are still unable to provide users with sensory feedback, such as the “feel” of things being touched or awareness of limb position and movement. Without this feedback, even the most advanced prosthetic limbs remain numb to users, a factor that impairs the limbs’ effectiveness and their wearers’ willingness to use them. In a step toward overcoming these challenges, DARPA has awarded prime contracts for Phase 1 of its Hand Proprioception and Touch Interfaces (HAPTIX) program.



*Read more:*

<http://www.darpa.mil/NewsEvents/Releases/2015/02/08.aspx>

## Nanotechnology

### Achieving Control of Occupational Exposures to Engineered Nanomaterials

Occupational exposures resulting from Engineered Nanomaterials (ENMs) can pose a challenge for applying traditional risk assessment, control, or evaluation standards. This review article discusses the limitations in traditional risk management

approaches when it comes to ENM exposures, reviews current monitoring options, and suggests an interim management framework until research can meet the standard of evidence required by legislators.

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concerns to exposure management: Risk Assessment, Exposure Control, and Exposure Monitoring. The resources supported for meeting these three components involve the integration of the Control Banding Nanotool and Nano Reference Values, both of which have been piloted and accepted through peer-reviewed processes and industry consultation.

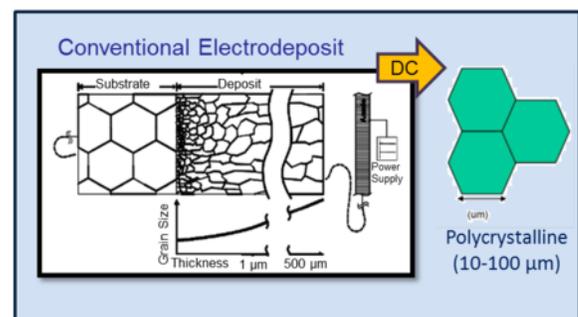
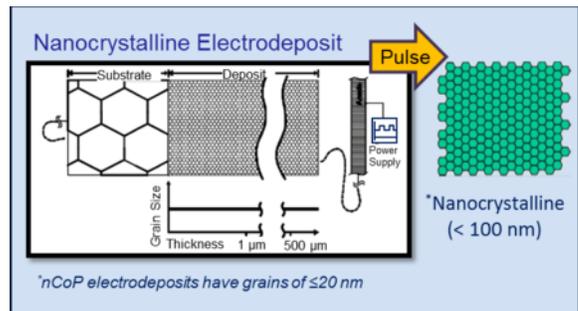
The proposed Nanomaterial Occupational Exposure Management Model (NOEM) offers a pragmatic approach that integrates resources from current academic research to provide a framework that can be applied by both industry and regulators. The NOEM Model focuses on addressing three

*Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 16 Jan 2015 (Available with AIHA membership)*

## Nanocrystalline Coatings Provide Hard Chrome Alternative

Implementation of ESTCP-demonstrated electrodeposited nanocrystalline cobalt-phosphorus (nCoP) coatings on military aircraft will eliminate environmental and worker safety concerns associated with hexavalent chromium used in DoD plating operations, and reduce operational costs.

Read more: <https://www.serdp-estcp.org/News-and-Events/Blog/Nanocrystalline-Coatings-Provide-Hard-Chrome-Alternative>



***Regulatory Research & Industrial Hygiene Professional News***

***Federal***

**OSHA, EPA, and Fertilizer Safety and Health Partners Sign Alliance to  
Protect Workers and First Responders from Hazardous Chemicals**



OSHA entered into an alliance with the Fertilizer Safety and Health Partners and the Environmental Protection Agency to provide safety and health information and training resources to workers, emergency responders and communities surrounding establishments in the agricultural retail and

supply industry. The alliance will focus on the safe storage and handling of fertilizers such as ammonium nitrate and anhydrous ammonia.

*Read more:*

[https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=NEWS\\_RELEASES&p\\_id=27306](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=NEWS_RELEASES&p_id=27306)

***EPA***

**Climate Action Plan Toolkit: EPA Releases Stormwater  
Climate Change Tool**

EPA is releasing an assessment for public As part of President Obama's Climate Action Plan Virtual Climate Resilience Toolkit, the U.S. Environmental Protection Agency (EPA) announced the release of the Climate Adjustment Tool for EPA's Stormwater Management Model – a widely-used, downloadable online stormwater simulation model. The Climate Adjustment Tool allows engineers and planners to evaluate the performance of water



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infrastructure while considering future climate change projections, such as more frequent high-intensity storms and changes in evaporation rates of seasonal precipitation, to determine the benefits of resiliency decisions to reduce local economic burden and protect communities.

*Read more:*

<http://yosemite.epa.gov/opa/admpress.nsf/21b8983ffa5d0e4685257dd4006b85e2/fd703ee59924638a85257deb005eb701!OpenDocument>

## OSHA

### Safety and Health Information Bulletin Warns of Hazards from Exposure to Grain Fumigants



exposures to workers involved in the handling of both fumigants and treated grain. An upsurge in insect infestations and the movement of stored grain have contributed to the need for increased fumigation, putting exposed workers at increased risk. The toxic effects of these fumigants can include permanent central nervous system damage, heart and vascular disease, lung edema and cancer.

OSHA has released a Safety and Health Information Bulletin warning of hazardous exposure to chemical fumigants used in insect control in stored grain. The use of chemical fumigants can result in hazardous

*Read more:*

<https://www.osha.gov/dts/shib/shib010615.html>

## FAA

### U.S. Transportation Secretary Foxx Announces Proposed Rule to Increase State Safety Oversight of Rail Transit Systems

Reflecting new statutory safety authority established by the Moving Ahead for Progress in the 21st Century Act (MAP-21),

the proposed rule issued by the Federal Transit Administration (FTA) would give states more resources to increase oversight

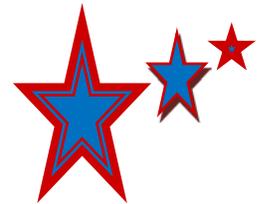
# Army Industrial Hygiene News and Regulatory Summary

over rail transit systems. The proposed rule would require adoption and enforcement of federal and state safety laws, and require SSOAs to be financially and legally independent of the rail transit systems they oversee.

Read more: <http://www.dot.gov/briefing-room/us-transportation-secretary-foxx-announces-proposed-rule-increase-state-safety>



**USAPHC**



## How to become a DOEHRS-IH Super Star

- ✓ Do you feel like you use DOEHRS-IH more than other program offices?
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- ✓ Do you wear a unitard and cape under your clothes? (Don't answer this question please)

Email the [Industrial Hygiene Training Coordinator](#) a brief synopsis about a new idea, a faster way, or a milestone you just met. Your Program Office just may be nominated as the monthly DOEHRS-IH **Super Star**.

## Training

### Competency Self-Development Tool



Do you want to know how much you really know about your IH Biohazard Core Competency?

Are you preparing for the CIH exam?



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Take advantage of the new competency self-development tool offered available at the AIPH Blackboard Learn.

Description: this Blackboard course shell is designed as an IH Competency Verification self-development tool. The practice exams in this shell will provide you with an idea of how competent you are in the BIOHAZARD IH Competency. The exams are modeled from CIH prep questions and are also an excellent starting place for individuals who are studying for the certification exam.

Course Length: (this is not a course-it is a self-development tool only)

Certificates: (there are no certificates available for any work done in this Bb shell)

Retattempt Policy: You may retake any of these practice exams when the new academic quarter begins.

Availability: Our quarters are from 1 September-30 November, 1 January-31 March, and 1 May-31 July.

Visit <http://aiph-dohs.ellc.learn.army.mil>

# Army Industrial Hygiene News and Regulatory Summary

This monthly summary is published by the Industrial Hygiene and Medical Safety Management Program (IHMSMP) for the U.S. Army Public Health Command.



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Apply current knowledge of the industrial hygiene scope of work, mission, inspection and survey techniques, health standards, action levels, regulations, policy and guidelines to evaluate the adequacy of compliance or conformance with all applicable occupational health standards and Federal regulations.

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