National Safety Management Society DIGEST

Updating Members on Safety Management News

March 2010

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Welcoming Our New 2010 NSMS Members

On behalf NSMS President Roosevelt, the NSMS Executive Committee and the NSMS Board of Directors, we like to thank all members who have proactively renewed their 2010 National Safety Management Society memberships. We would also like to acknowledge, recognize and welcome the following new members to our professional organization:

- **Dr. Darrell L. Dechant,** Executive Director – University of Alabama, College of Continuing Studies, Division of Environmental and Engineering Programs (Tuscaloosa, Alabama)
- **Florence H. Dosh,** Logistics Management and Public Affairs Officer – Hawthorne Army Depot (Hawthorne, Nevada)
- **Kenneth R. Motsenbocker,** HES Professional – Marathon Oil (Grand Junction, Colorado)
- **John Randall,** Utilities Safety Manager – Cedar Rapids Utilities Department (Cedar Rapids, Iowa)
- **Juan F. Charles Santana,** President – Juan Charles & Associates (San Juan, Puerto Rico)

We appreciate your interest in furthering your skills, knowledge and abilities in the management of safety and risks, as well as your interest to networking and professional development. Welcome again to NSMS!

Election Results for Two (2) NSMS Board of Directors Openings

In a very competitive race by our three candidates, the votes have been tallied to fill the two available Board of Directors' seats. NSMS is pleased to announce the results of our election for two (2) NSMS Board of Director positions. We wish to thank all of our dedicated candidates for their interest to serve and contribute to this wonderful organization. One hundred and nine votes were cast and our top two vote-getters were:

- **President Roosevelt Smith**
- **Dr. Jeffrey Chung**

We appreciate these two individuals' interest and commitment to serve once again on the NSMS Board and contribute to the Society's growth and needs of our membership. This leadership role is critical to help chart the strategic direction for our Society and address members' professional development.

The ISHM "Certified Safety and Health Manager" (CSHM) Accreditation Has Been Achieved!

The vision of our early NSMS founders to develop a safety management-focused credential to recognize professional competence in safety leadership has culminated in the official accreditation of the NSMS-created Certified Safety and Health Manager credential by the Council on Engineering and Scientific Specialty Boards (CSEB). CESB is a self-sustaining, independent body which accredits certification programs organized and operated consistent with sound credentialing practices tailored to the needs of engineering and technology specialties. CESB is the recognized accreditation body for engineering and scientific certification and specialty certification programs for professional credentials such as the Board Certified Environmental Engineer, Certified Industrial Hygienist and Certified Hazardous Materials Manager.

Our sister organization, the Institute for Safety and Health Management (ISHM) and its Board of Directors deserve all the credit for their leadership, diligence, determination and perseverance in marshalling this monumental effort to fruition. Our CSHM credential holders deserve our gratitude for their patience as this initiative effort went through many trials and tribulations over the years. The Institute for Safety and Health Management is the credentialing organization which administers the CSHM to recognize safety and risk management professionals who, through demonstrated professional experience and the passing of a comprehensive exam, have met ISHM's requirements for mastering the safety management body of knowledge.

The CSHM credential recognizes safety and health professionals who demonstrate knowledge of health and safety management skills and techniques through examination and experience. The CSHM certification program promotes the integration and practice of safety management principles throughout all levels and activities of an organization. In addition to technical knowledge of safety and industrial hygiene, a successful safety and health manager must possess working knowledge of a broad range of business and financial principles and an understanding of related issues such as hazard analyses, accident/incident investigations, safety audits/surveys, workers' compensation, risk management, product safety, human factors, environmental laws, quality, and labor relations. The CSHM program is designed to provide recognition of those who can apply such a broad range of health and safety management tools. NSMS offers to be a resource and facilitator to help those interested in pursuing such a certification.

NSMS' "Certified Safety Supervisor (CSS)" Credential Now Accepted Towards Associate Safety Health Manager (ASHM) Designation

Associate Safety and Health Manager (ASHM) designation is intended to recognize those individuals who possess some combination of formal training and experience listed below that prepares them for safety and health management responsibilities. The ASHM serves to let potential employers and current employers know that these individuals have been formally educated to address workplace safety and health issues or are ready to step into entry level positions in safety management.

Individuals who receive the ASHM designation have a period of six years to pass the accredited Certified Safety and Health Manager (CSHM) certification examination. The ASHM designation will permanently expire six years after the date of issue or when replaced by the CSHM designation, whichever comes first. For more information, please visit the ISHM website: http://www.ishm.org/pages/associate.html

Upon completion of the application package, approval by the review committee, and payment of the appropriate fees, a candidates who does not have a college degree, but is a holder of a safety certificate recognized by the ISHM Board (*http://www.ishm.org/pdf/certprograms.pdf*), plus nine years of qualifying work experience is eligible for the ASHM designation:

SPECIAL ADVANCED ANNOUNCEMENT:

NATIONAL SAFETY MANAGEMENT SOCIETY

Upcoming Special Professional Development Workshop
Now Tentatively – Spring 2010
Note: Houston, Texas or Las Vegas, Nevada

Many emails have been coming in recommending to NSMS that we offer an interdisciplinary two-day professional development workshop that will enable safety professionals/managers sharpen their skills, knowledge and abilities in interacting with employees and company leadership. We are considering a pilot workshop beginning in the Houston, Texas area and going forth to other regions where our membership would like to have it presented. If we come to your locale or college campus, we hope this will be a more cost-effective opportunity to learn and expand your skills, knowledge and abilities (SKAs). As a cost-effective alternative venue, there have been recent suggestions by members to hold the workshop in Las Vegas, Nevada. We will be polling those who have expressed interest in attending to determine the most convenient location.

The tentative workshop fee (early, pre-registration) for NSMS members is $125 and $250 for non-members and an on-site (or late) registration of $160 for NSMS members and $275 for non-members (includes lunch and program materials). College students majoring in this field of study are also invited to attend (NSMS Student (Affiliate) Members workshop fee is $100). We need a minimum of 50 attendees to cover the cost/break even on this 2-day training event. (We currently have 25 respondents – half way there!) Please email us at nsmsinc@yahoo.com if you are interested in possibly attending so we can begin to establish a headcount. Thank you.

"Enhancing Safety Management SKAs: 2-Day Professional Development Workshop"

Instructor: Dr. Jeffrey Chung, CSHM CHFP – NSMS Executive Director

Day One –

- Administrative Business, Introductions and Workshop Overview
- Safety Management Principles and Practices
- Safety Attributes for Best-in-Class Organizations
- Emerging Safety and Health Issues – Aging Workforce, Green Jobs and Special Needs of Foreign Workers
- Psychology of Safety – A Behavior-based Approach; Human Performance Improvement
- Developing Effective Training/Presentation Skills
- Role of Safety Committees; Conducting/Facilitating Effective Meetings

Day Two –

- Understanding Self/Others/Your Organization – SMART Profile
- Strategic Planning Concepts and Process
- Problem Solving and Analytical Tools
- Performance Metrics for Continuous Improvement
- Corporate Communication Strategies for Safety/Risk Management Professionals
- Ethics for the Safety Practitioner and Manager
- Stress and Health Management for the EH&S Professional
- Wrap-up and Workshop Evaluation

The NSMS "Blog" is Here

Steve Geigle has created and launched the "NSMS Blog" on the NSMS website. It will allow members and others to post comments, remarks and initiate discussions about a variety of safety management topics and issues. You can participate in the Blog by going to the NSMS website (http://nsms.us) and look for the link on the home page along the left-hand column of navigation areas. The NSMS Blog can only thrive with the enthusiasm and expertise of its members and readership. We encourage and invite everyone who has an interest in workplace health and safety to be a part of the NSMS Blog and help create a community that helps all organizations be safer, healthier and compliant places to work.

FREE ACCESS: Online Certified Safety and Health Manager (CSHM) Educational and Exam Preparation Reference Materials

As a benefit for our current and future dues-paying members, NSMS is **permanently** offering free access to the Certified Safety and Health Manager (CSHM) preparation and educational materials. The online resources, created by NSMS member Steve Geigle, can be found at www.cshmprep.com and the only action an NSMS member needs to take is to email Steve requesting access from that website. You will need to include your current NSMS member number (found on your membership card and certificate). Once the number is verified, you will be granted a username and password to access the online reference materials. This is a great opportunity to brush up on your safety management and technical knowledge and prepare for a successful passing of the CSHM certification examination.

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Industries Tell OSHA Officials That Regulating Dust Can Be Complex, Expensive

(By Walter Jones, Morris News Service – February 17, 2010)

Representatives from a variety of industries told federal safety officials today that regulating the danger of combustible dust can be complicated and expensive for businesses. The U. S. Department of Labor's Occupational Safety and Health Administration is holding the second of a series of roundtable discussions with industry volunteers as it considers drafting regulations. It started the process last year in response to congressional reaction to a dust explosion at Imperial Sugar's Port Wentworth mill near Savannah that killed 14 workers two years ago. Many of the victims were brought to Augusta for burn treatment.

Dorothy Dougherty, director of standards guidance at the agency, said there is no date set for when regulations would be drafted. "We have to take our time," she said. Most of the comments cautioned against applying too strict of a standard to every industry, from food processing to sand blasting to coal dust at neighborhood print shops. "If I spill a gallon of gas in the middle of this room, we're all going to head for the exists. It I drop a bag of flour, we aren't," said Thomas Lawrence of RRS/Schrimer of Ballwin, Mo. Cost estimates for compliance ranged from $2,000 to test dust for combustibility to as much as $30 million to upgrade a power plant. Brian Edwards of Tucker, Ga.-based Conversion Technology warned that many costs are the same for specific machinery regardless of business size.
"If a company has to put in explosion-suppression equipment, it's going to cost the same whether it's a Fortune 100 company or a mom-and-pop shop, and that's hundreds of thousands of dollars," he said.

OSHA and Scaffold Industry Association Launch Transport Platform Safety Tips

(Occupational Health & Safety Magazine – February 18, 2010)

Through the OSHA and Scaffold Industry Association Alliance, SIA has developed "Transport Platform Safety Tips." The Safety Tips are designed to educate users on the correct way to perform their work on transport platform equipment.

"The recently approved Transport Platform Safety Tips is the second document of its kind developed through the SIA/OSHA Alliance Program, and a huge step forward in OSHA recognizing this new type of equipment." said Greg Janda, SIA Mast Climbing Council chair and document coordinator. "Along with the ANSI standard approved in 2009, these safety tips will reach the people using this type of product and help educate them on the safe and proper use of transport platforms. The Mast Climbing Council looks forward to working with OSHA, through the Alliance Program, to develop additional safety related material."

Transport Platforms Safety Tips:

The transport platform (TP) is a tool of the trade used to move authorized and trained personnel with their materials and tools between levels at a worksite.

- TPs should be operated, used, erected and dismantled only by personnel who have been properly trained and familiarized with the specific model/machine. Only people who are authorized and have received the required training are permitted on the TP.
- A pre-start inspection must be completed at the beginning of each shift prior to use.
- Do not exceed the maximum load limitations, including both personnel and material for the configuration of the TP being used.
- Make sure that all inspections and maintenance are performed as required and according to the manufacturer's instructions.
- When dismantling, do not remove the wall ties unless the base and remaining ties can support the TP configuration without tipping.
- Ensure the TP operates at a minimum travel distance of 18 inches from the building or structure.
- When moving the TP always look in the direction of travel. Ensure there are no personnel or material beneath the platform.

- When descending, ensure the TP stops automatically no less than 10 feet above the supporting level for at least three seconds and sounds a continuous warning from that point until the bottom is reached.
- Always install guardrails and mast guards. Ensure access gates and other access locations are protected with guardrails. Ensure that no material or personnel project beyond or overhang the platform guardrails.
- Use all required personal fall protection equipment during erection and dismantling.
- Only use normal operating controls for the TP. Do not bypass or override the normal operating controls or safety devices.
- Check for hazards such as overhead obstructions, building protrusions, high voltage lines, inadequate base support, drop offs, debris and other unsafe conditions.
- If jobsite conditions dictate and when transporting personal, a roof shall be fitted to the TP, to protect from falling objects.

The TP Safety Tips can be downloaded at the following website – ***http://scaffold.org/UserFiles/file/final%2002_16_10%20TP%20Tip%20Sheets.pdf***

Is Safety Really a Thankless Job?

(The Daily Reporter – February 1, 2010)

The job of safety supervisor can be a frustrating one, don't you think? Every day we try to convince our workers to take precautions like using respiratory protection when mixing cement. If you're in construction, I'm guessing you know what I mean. You try every argument in the book - citing rules, evoking common sense and even playing the family card to appeal to workers' emotions. We're constantly doing and saying the same things over and over again. I sometimes feel like I'm following the instructions on the back of a shampoo bottle: wash, rinse, repeat. We all have our reasons for doing this job. But are we wasting our time in a thankless profession? A recent conversation I had caused me to confront this question.

A Moment of Doubt

Last year, an acquaintance of mine, somebody with many years of experience and for whom I have great respect, asked me why I had gotten into such a thankless career. His question caught me off guard. I hadn't thought of my job as being thankless and didn't think anybody else would either. When I asked him to explain, he pointed out that my success was judged ultimately on decisions that other people make. I might not be directly involved in the choices, but if an incident occurs as a result, everyone will turn to me.

I walked away from the conversation a little disturbed. He seemed to have a point. What is the point of all this, I wondered. I mean, these workers never thank me for the job I'm doing or appreciate the advice I give them. Often, those of us in this position are seen merely as the hindrance. It's "great, here comes the safety guy. I wonder what I'm doing wrong this time."

The conversation struck a chord and caused a little doubt to set in. Although I wasn't about to quit, I did take an objective look at my choice of profession. It made me step back and think about the 30+ working years I have ahead of me.

What Other Thankless Jobs Are Out There?

Just out of curiosity, I did an Internet search for the most thankless jobs. I didn't expect to see any safety jobs on the list. I just wanted to see what other thankless jobs people do. (I was also mildly ashamed of doubting - even for a moment - my choice of being a supervisor and needed a kick in the butt).

As I worked my way down the listed jobs, I realized how thankful I was that I wasn't doing any of them. Not because they were beneath me, but because I realized that my job was much more rewarding than the ones on the list. Of course, I mean no offence to anyone, but IRS agent? You talk about thankless. I don't think IRS agents get too many thank you's at the end of the day.

Recommitting to the Profession

So why did I give in so easily to this person's comments and not jump to my feet and defend how great my job was? It could just have been that I was tired and not in the mood. Or it could have been something much different than that - an evil word called complacency. I needed to recharge and revisit what I was doing.

I realized that I had fallen out of good habits that I had formerly sworn by. One of those habits was taking lunch or coffee breaks with the workers in the trenches. It was often during these breaks that I had received the most useful information about what was really going on on-site. The majority of trades people on-site will not come to you. You have to go to them. Before, I had made it a habit to do so. But complacency had set in and I wasn't doing this anymore. And, as a result, I wasn't getting as much feedback as I used to.

I also took this moment of clarity as an opportunity to re-immerse myself in leadership and management books. In the past, I have learned new managing and communicating techniques from these books. But upon cracking the books this time, I was surprised to see that most of the things the authors were recommending were methods I already use - or used to use when I wasn't so complacent. I realized that I knew *how* to be a good leader and communicator. I just had to get back to doing it. In addition to reaffirming my career choice, this experience renewed my confidence and inspired me to get back out there and do the job the way I knew how to do it.

Conclusion

Let's face it, everyone likes a pat on the back once in a while. Some of us need it more than others. But I suspect most of us in the safety profession feel that we don't get the kudos we think we deserve. If it's verbal thank-you's and praise you need, then ours *is* indeed a thankless job.

But remember that reaffirmation can and must come not just from others but from within ourselves. We, as safety supervisors, just need to step back and remind ourselves of the importance of what we do. That should make us feel good about ourselves and the job we do. More importantly, it should inspire us to renew our commitment to use all our skills, habits and experience to do the job as effectively as we can.

How to Change Your Safety Program Without Really Changing

(By Gerald A. Edgar, safetyXchange – February 16, 2010)

"If you keep doing the same thing, you will always get the same results." We've all heard variations of this overused phrase hundreds of time, but I think it's an over-simplification. If you did exactly the same thing in exactly the same environment, then, yes, you may get the same results. But what if the environment changes? Then the results will change, too.

How to Get Better Results from Your Safety Program

Let's say there are elements of your safety program that don't produce the results you want. It can be disheartening, yet you keep trying. Should you stop? No, of course not. But if you want to improve your results, maybe you should consider the environment. Let's look at 5 elements of a safety program and see what can be changed to improve results.

1. Your Safety Committee

Current situation: You've tried using safety committees, but they're not working. There's no interest, they turn into gripe sessions, managers ignore you, etc.

Consider changing:

- The members: Do you have the right people on the committee? Look at who selects them and what the selection criteria is;
- The timing: Look at when and where the committee meets. Sometimes this can have an adverse effect on the tone of a meeting; and
- The process: What happens to suggestions made by the committee? If they don't lead to action, then no wonder there's no interest.

Other companies can make their safety committees work. So do a fishbone analysis of the committee the same as you would for an injury and determine why your committee is failing.

2. Your Safety Posters

Current situation: No one pays attention to the safety posters. You're thinking they're a waste of money.

Consider changing:

- Their look: Be sure your safety posters are eye-catching;
- Their location: Safety posters are more effective when they're located in high traffic areas;
- Their state: Safety posters should be kept clean & well-lighted;
- Their freshness: Safety posters should be rotated at least every two weeks to stay ‘fresh';
- Their subject: Safety posters should be related to the actual needs of the plant. There's no need for forklift safety posters if you don't have any forklifts.

3. Your Safety Bulletins

Current situation: No one reads the safety bulletins or safety newsletters.

Consider changing:

- Their format: If you're using generic newsletters, try creating your own;
- Their content: Include a Q/A column, give examples of how the safety rule applies to home as well, share actual incidents that occurred recently, etc.;
- Their interactivity: Throw in a contest. Consider a posed photo in your plant with multiple safety violations. Have everyone submit the list of what they see wrong and offer a small prize to someone drawn from all the correct responses;
- Their distribution: I find the best way to distribute the safety newsletters is to leave them on lunch tables or hand them out at the exits at quitting time. Stand there, hand them out and wish everybody a safe drive home.

4. Your Safety Meetings

Current situation: Safety meetings are a waste of time. No one pays attention.

Consider changing:

- The presenters: Don't have the same person lead every safety meeting. Vary your presenters;
- The length: Safety meetings should be kept brief;
- The tone: Throw in a joke;
- The content: Refer to something topical or related to a recent occurrence on TV or in the news;
- The time and place: Is there a better time of day for your meeting or a location with fewer distractions?

5. Your Safety Advice

Current situation: You show people how to wear earplugs properly, relate a rule or (fill in the blank). But a week later it's obvious they didn't listen.

Consider changing:

- Your method of delivery: The time, place or training tool could be the real root cause of failure. Consider changing any of these;
- Your assumptions: Are you assuming that what you've said has been understood? Ask your workers to repeat the technique or concept to you. Remember, practice makes perfect;
- Your language: Check that you're not being too technical, too preachy or talking down. Ask for feedback.

Conclusion

Your safety committees, posters, newsletters, meetings and advice are all essential elements of your safety program. If they're not working, then ask your workers and your colleagues why they think something is failing. (Truly listen to the feedback; don't be defensive.) And don't give up! By making a few small changes, you can actually keep doing the same thing and get different results.

Policeman's Widow Aims to Improve Safety for Emergency Responders

(Safety Smart Weekly Safety Briefing – February 15, 2010)

Being a cop carries a laundry list of dangers which can cut that career short in an instant. But Maryanne Pope never expected to lose her policeman husband John Petropolous, 32, the way she did nearly 10 years ago.

Responding to a break-in call at a warehouse in Calgary, AB, Canada, Petropolous did not fall victim to criminals, but instead fell through a false ceiling and died from brain injuries. A safety railing probably would have saved his life, but there wasn't one.

Pope, who wants to save families of police officers, paramedics, firefighters and other emergency responders from similar heartbreak, has launched a campaign to make workplaces safer for not just workers, but for anyone who might enter them.

People don't understand that they (emergency responders) are going in after hours and of course, the premises would look very different," says Pope, whose public awareness campaign is called Put Yourself in Our Boots.

The campaign website shows videos of police, firefighters and ambulance attendants responding to emergencies where they could suffer potential injuries or even die.

Pope wants to ensure that workplaces are kept free of clutter, are well lit, have easily accessible, well-marked and unlocked emergency exits and have warning signs and guardrails in place. She also wants motorists to be more mindful of emergency vehicles responding to calls.

Visit the Put Yourself in Our Boots website at - http://ourboots.ca/?utm_source=e-mail&utm_medium=email&utm_campaign=WeeklyBriefing

VPP Is Alive and Well, Association Announces on Video

(Safety.BLR.com – February 16, 2010)

The Voluntary Protection Programs Participants' Association (VPPPA) released a video earlier this month confirming that VPP will "continue to thrive." According to the organization, the video was released "in response to concerns about the future of OSHA VPP." A live online chat with Labor Secretary Hilda L. Solis and OSHA Chief Dr. David Michaels had "raised questions among VPP participants, which the association aims to address."

Among specific concerns was a possible $3 million decrease in funding for compliance assistance in the proposed 2011 budget. VPPPA says that during the video chat, Solis indicated that OSHA would take additional funding away from VPP and apply it to enforcement. The

support of Solis and Michaels for Voluntary Protection Programs was, however, confirmed, according to the association.

The video features comments from VPPPA Executive Director R. Davis Layne, who offered this perspective: "During my 35 years with OSHA, I've seen this happen many times. Support for government programs comes and goes, but in the end, it all evens out. I'm confident that this will be resolved."

Occupational Biomechanics: Explaining the Discipline and Its Application

(By Dennis R. Andrews, PhD PSP CECD, safetyXchange – February 7, 2006)

What exactly is occupational biomechanics? Who uses it and how can it reduce injuries in the workplace? This and the subsequent article will attempt to answer these questions.

A Working Definition

Biomechanics has been around for many years. The term has been used to describe many different disciplines. For purposes of this article, I will use the following working definition:

The scientific methodology concerned with injury thresholds and mechanisms of injury of the musculoskeletal system and related components and their relationship with mechanical forces when physical work tasks are performed.

Biomechanics can determine a range or tolerance threshold of occupational injuries. It is not itself considered a medical function, but an occupational biomechanical practitioner must be trained in anatomy and injury mechanics. Further medical training is required to diagnose and provide treatment.

The Interplay with Ergonomics

Ergonomics studies the efficiency between the human body and the working environment and tasks.

Occupational injury biomechanics addresses injury threshold and injury mechanisms of the ergonomic aspects of the work tasks.

As for the interplay between the two, ergonomics issues, such as sitting, standing, reaching etc. are necessary in any occupational biomechanics study. Injury biomechanics takes this to the next level and determines injury mechanisms and human tolerance during working tasks.

<u>Practitioners of Occupational Biomechanics</u>

Occupational biomechanics is used by many researchers and companies and is taught in many universities, either in conjunction with the public health degrees or OSHA-related degrees. Students of occupational biomechanics include:

- Industrial and production engineers
- Industrial hygienists

- Occupational physicians or nurses
- Orthopedic or rehabilitation physicians, including physical therapists
- Ergonomics and biomechanics personnel
- Safety managers and labor relations personnel.

How Companies Use Occupational Biomechanics

Today's companies apply occupational biomechanics to improve working conditions.

For example, a company seeking to expand or redesign its workplace would benefit from an occupational biomechanics study relating to machines, tools, workstation benches, etc. A company may also feel that its injury rate is intolerable and require an occupational biomechanics study, complete with suggested improvements.

In assessing the workplace, occupational biomechanics uses the laws of physics and engineering concepts to describe the force on the motion of various body segments and their related forces during occupational functions and tasks. For example, lifting is a mechanism of injury if it is not performed properly or the tolerance levels are beyond the threshold for human injury. This is very important in material handling tasks.

Analyzing Forces

A simple slip and fall can cause serious injury or death, since the impact with the floor or an object is over a short period of time (milliseconds) and usually involves a localized segment of the body.

Force is a product of: Mass x Acceleration

Acceleration is a product of: Change of velocity

Change of time

With this description, it's easy to understand that force greatly increases with the decrease in time over which the force is applied.

If the force is sudden, injuries such as contusions, fractures, concussions, etc., can occur. If the activities involve over-exertion with or without repetitive motion, these injuries can result:

- Tendonitis
- Cumulative trauma and nerve disorder
- Lower back disorders.

Understanding the threshold of forces and mechanics and dynamics to help prevent these injuries is the cornerstone of occupational biomechanics.

Conclusion

Next we'll discuss the various methodologies used to monitor and determine corrective actions to reduce injuries in the workplace.

Occupation Biomechanics: Explaining Measuring Methods

(Dennis R. Andrews, PhD PSP CECD, safetyXchange – February 14, 2006)

In the article above, we looked at the discipline of occupational biomechanics and explained why companies turn to it to reduce workplace injuries. Now we'll look at the various methodologies used by practitioners of occupational biomechanics.

Methodology Areas

The methodology used by occupational biomechanics practitioners is divided into six general areas:

- Kinesiology
- Modeling methods
- Anthropometrics
- Bioinstrumentation
- Mechanical work capacity
- Motion and time evaluation

Each of these methods is used to monitor, evaluate and determine corrective actions and causes relating to injuries and death in the workplace. Let's take a look at each of them.

1. Kenesiology

Kenesiology is the study of human movement without considering the actions of force. It is an important discipline in understanding biomechanics and biomechanical applications.

Variables in kenesiology are:

- Angular and linear movement
- Velocity
- Acceleration
- Internal and external forces
- Movement.

2. Biomechanical Modeling

Evaluating the capacity of a worker is the prime target of occupational biomechanics and it requires a true understanding of the human body kinematics. Kinematics that involve unrelated experiments would yield little or no useful data when applying this data to a specific segment.

Biomechanical modeling is one method of analyzing the physical criteria needed for specific occupational positions. The modeling can be as simple as writing down the pros and cons and drawing a free body diagram, or as complicated as a 3-D computer animation.

Since work capacity varies greatly, these variables, among others, must be explored, categorized and evaluated as they relate to the position to be filled:

- Genetics
- Age
- Fitness

3. Anthropometrics

Anthropometrics is the study of human body segment measurements of various populations localized and globally. It's said that to design a machine for the average person is to design a machine for no one since there's no such thing as the average person. Machine and automotive designers thus shoot for the 95^{th} percentile values when researching product liability issues and safety.

When analyzing anthropomorphic data, exercise caution if the source of this data is not known or understood. In earlier times, the only available anthropomorphic data came from the military, which gathered data from robust healthy males and females within a certain age group. This resulted in the skewing of data just as would occur if one tried to determine the average size of a college campus and included all the athletes. This type of information greatly limits the use, analysis and outcomes for ergonomics and biomechanics.

4. Bioinstrumentation

Instrumentation is crucial to the collection and organization of the data necessary for evaluating occupational biomechanics. Measuring devices attempt to report accurate data, including deviations. Repeatability is necessary and is one test of the degree of accuracy. When selecting a measuring device, occupational biomechanic practitioners should look for a device that is:

- Easy to use
- Not overly time-consuming
- Not burdensome
- Reasonably priced for the task and desired results
- Flexible enough to measure multiple joints or motions so that numerous devices are not necessary.

One such device is a Goniometer, which consists of two arms, a level and a round wheel with degree markings. This device is used to measure various ranges of motion of body segments in relation to the long axis. Accelerometers and rotational transducers can also be used. These are usually quite inexpensive and meet the additional criteria

5. Mechanical Work Capacity

Every person has a different biological capacity for stressful work. Mechanical work capacity measures the amount of working loads that a person can handle without suffering adverse effects. It considers variables such as the specific biomechanical joints that will be utilized for the task and calculates the moments (force vectors) to ensure that the worker's limit or capacity (injury) is not reached before a task is completed.

***Joints**:* The primary consideration should be the measurements of the specific connecting joints within the skeletal system used during the task. Joint motion and muscle strength are important properties in biomechanics in determining the probability of injury.

Posture: Posture plays an important part in muscle strength measuring and must be considered with all test subjects. The strength of the bicep changes based upon the moment arm and angle of flexion and extension. It is best to prepare a strength diagram to determine the effect of the moment arm and peak strength of the muscle under testing. (Moment arm is the rotation produced in a body when force is applied, such as torque.)

Muscle Strength: Measuring muscular strength both from a static and dynamic position requires specific testing criteria. The measuring device must record peak strength and average strength over approximately three-second intervals. The testing must be performed without creating discomfort for the test subject in the muscle being tested. There must be rest periods of specific and consistent length for test subjects to recover. All distractions must be eliminated and standard postures must be adhered to.

Measuring static strength is pretty straightforward; but measuring dynamic strength is far more complicated because of the many variables, including:

- Muscle velocity
- Displacement, and
- Acceleration curves estimates.

Large body segments fluctuate dramatically depending upon the acceleration or deceleration of the movement. If it's assumed that the maximum strength of a lifted load would be performed slowly, then a worker's dynamic lifting strength can be estimated. Of course, during the lifting movement the load should be kept close to the body and the back should be vertical. This posture is the safest when lifting objects from the floor or near the floor. A bent-over posture, keeping the load away from the body, is simply inefficient and has a higher probability of back and spinal injury.

Speed of the exertion motion and strength of the muscle are also correlated. The faster the muscle is in contraction, the more strength it produces. This could be considered by some as muscle momentum since a quick jerk can momentarily increase the muscle strength as compared with muscle strength over a longer time period.

6. Motion and Time Evaluation

The sixth methodology, motion and time evaluation involves:

A Joint Assessment: To achieve biomechanical safety, workers and supervisors must identify and be aware of unsafe stress factors.

Measuring Time: Time refers to the element of finishing a task; for example, for those working on conveyor belts where the product passes in front of the worker, the task has a time value. Each task has a minimum, median and maximum time limit to perform the task safely. An evaluation of the worker and the subject task is required to set safe time limits for a particular job function and predetermine the motion for each task.

Assessing Motion: To analyze safe task performance, you must be able to separate and evaluate each movement of a particular task. Some of the movements analyzed include:

- Reach
- Position for most efficient movement
- Release factor after the motion is completed
- Rebound, as when pulling pieces apart on an assembly line
- Grasping or controlling an object
- Eye movement and focus
- Turning or manipulating tools or parts
- Body segment motion, and
- Motion of all or some of these movements simultaneously.

Conclusion

After gathering as much data as possible, a biomechanical team must analyze the data. The team should create charts, graphs and tables. These tables should classify motion and time so that analysis of the work capacity can be determined. This data will help a company choose the right person for the right task and identify tasks that require position adjustment. Remember that all seemingly similar tasks are not the same; an employer may be unaware of minor adjustments made by a worker.

Safety Tips for Snowblower Operators

(Safety Smart Weekly Safety Briefing – February 15, 2010)

As many people have learned recently, using a snowblower to clear the driveway sure beats shoveling it. Unfortunately, people have also learned that this snow removal method can lead to some serious injuries, including lacerations, amputations and bone fractures. According to the American Society for Surgery of the Hand, many of these injuries occur when machine operators try to dislodge impacted snow from the chute.

There are also musculoskeletal injuries to consider. The American Academy of Orthopaedic Surgeons warns that the improper use of snowblowers, coupled with muscles being overextended and overexerted, can wreak havoc on the shoulders, wrists and backs.

To keep yourself – and those around you – safe, keep these points in mind while operating snowblowers:

- Dress appropriately, including slip-resistant footwear.
- Read the safety manual.
- Add fuel before starting the machine, not while the machine is hot.
- Make sure all guards and shields are in place, and use only approved accessories and attachments.
- Before you start, inspect the area and clear it of foreign objects that could fly out of the machine.

- Mark the locations of water and gas shut-off valves before clearing snow.
- Adjust the collector housing so it won't strike gravel or rock surfaces.
- Ask bystanders to step away from your work area.
- Keep your hands and feet away from all moving parts.
- Be aware of carbon monoxide poisoning hazards, and don't run the engine in enclosed areas.
- Always know where the power cord is when using an electric snowblower.
- Direct the snow away from buildings, vehicles and pedestrians.
- Do not clear snow from steep slopes.
- Do not leave the snowblower running unattended.
- Pace yourself.
- Always turn the machine off before making machine adjustments or repairs and wait at least five seconds for the blades to stop moving.
- Use a stick or broom to clear clogged snow – not your hands!

FDA To Decide Whether Butter Flavoring Is Safe For Consumers

(By Anietra Hamper, The Columbus Dispatch – February 12, 2010)

The U.S. Food and Drug Administration is reviewing a food additive that critics say puts consumers at risk of developing a rare, irreversible lung condition that has been found in workers at popcorn factories.

Some medical researchers and product-liability attorneys have warned that consumers can develop bronchiolitis obliterans by inhaling diacetyl, a chemical long used to give microwave popcorn and other foods a buttery flavor.

"We're looking at the available information we have on the potential for consumer exposure and how that relates to the available safety data," said Dr. Mitchell A. Cheeseman, director of the FDA's Office of Food Additive Safety.

"At this time," he added, "we still consider diacetyl used as a flavoring agent to be safe for consumers."

Diacetyl's critics agree that the chemical poses no health threat when used as a flavoring agent, even in concentrations found at popcorn manufacturing plants. The danger, they say, lies in the vapors the chemical produces when it's heated -- a common occurrence during production.

Hundreds of popcorn workers have sued their employers and flavoring manufacturers after developing bronchiolitis obliterans, also known as "popcorn lung." The litigation has resulted in numerous settlements and judgments totaling more than $100 million.

Many popcorn producers, including the ConAgra Foods plant in Marion, have abandoned diacetyl in favor of other flavorings, but, according to the national Flavor and Extract Manufacturers Association, some companies still use it.

The possibility of a threat to consumers didn't arise until 2007, when bronchiolitis obliterans was diagnosed in Wayne Watson of Colorado.

Watson, then 52, had been eating two to three bags of microwave popcorn a day for 10 years. He particularly enjoyed inhaling the buttery steam pouring out of a just-opened package.

"When you open the microwave and take out the bag and pull the ends of the bag, you get that woof -- that *woof* -- and I would breathe it in because it smells good," Watson told WBNS-TV (Channel 10), which has been investigating diacetyl.

Watson sued, and two months ago, according to documents filed in U.S. District Court in Denver, he reached a settlement with one defendant, a flavor developer. The terms were not disclosed.

A member of Watson's legal team, Kenneth B. McClain, a Missouri-based lawyer who's represented hundreds of workers in popcorn-lung cases, said he recently filed lawsuits on behalf of three other consumers.

The physician who made Watson's diagnosis, Dr. Cecile Rose, head of occupational and environmental medicine at Denver's National Jewish Health Center, is convinced that diacetyl poses a risk not just to popcorn workers, but also to consumers.

She has relayed her concerns to four federal agencies, including the FDA.

The FDA says the scientific team assigned to review diacetyl will consider Rose's conclusions. The agency hasn't indicated when it might issue its findings.

U.S. Sen. Sherrod Brown, D-Ohio, who recently urged the U.S. Department of Labor's Occupational Safety & Health Administration to assess the workplace risks associated with diacetyl, said he'll be keeping a close eye on the FDA, too.

"We want to see the FDA either reassure us, without equivocation, or move forward on telling the public that this substance is questionable."

Safety Training Strategies: A Shocker Of A Prop

(By Brenda S. Uhls - Schwarze Industries, Inc., Richard Hawk's Safety Stuff – February 10, 2010)

This past week I was tasked with the dreaded annual "Lock Out-Tag Out" training for our employees and was looking for something to make the typically boring yet critical information a bit more palatable and entertaining. I found a dummy stapler that transmits a harmless electrical shock when the operator attempts to staple with it (powered with a AAA battery) and deemed it a perfect prop for our Lock out Tag out training.

I tagged the stapler with the appropriate tag, signed it and dated it with our maintenance supervisors name and set it on one of the desks prior to the class. When the students arrived I would ask one of them to please staple some papers for me and out of each class I taught that day, there were several employees that took the bait and got zapped.

The result was a fun ice breaker to introduce the topic and the importance of adhering to the rules

of the program. it's one the guys will remember for a while and poke fun at the poor fellas that got zapped They'll also now associate it with not operating a piece of equipment that's been tagged out.

Lessons Learned: OSHA Hits Concrete Company With Fines

(By Craig Wolf, Poughkeepsie Journal - February 19, 2010)

The federal Department of Labor's Occupational Safety and Health Administration has proposed $45,500 in fines against a plant here run by Cranesville Block Company. The agency said Thursday that citations and fines follow inspections based on employee complaints at the plant, which makes precast concrete products.

"OSHA found blocked exits, workers lacking safety glasses and gloves while working with acid, unlabeled containers of hazardous chemicals, unmarked electrical equipment, exposed live electrical parts and moisture in electrical equipment," a statement from the agency said. Two violations are repeats, OSHA said, because similar citations had been made in 2008 based on hazards alleged at the company's Fishkill and Glens Falls locations. The company has 15 business days to comply or have a conference or contest the findings.

The company is based in Amsterdam. Its president, John Tesioro Jr., could not be reached.

A spokesman for OSHA, Ted Fitzgerald, said the Fishkill incident resulted in Cranesville paying a fine of $2,975 and abatement of the hazards. A citation at its Glens Falls site resulted in a fine of $6,715 and abatement of hazards. The company's Web site lists 24 plants doing block-making and ready-mix concrete across upstate New York.

Lessons Learned: OSHA Cites Metro Livestock Feed Maker Over Alleged Fire, Explosion Hazards

(fox4kc.com –February 18, 2010)

The U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) has cited a metro livestock feed company operator over alleged fire and explosion hazards at their Kansas City facility. Endres Processing LLC of Kansas City faces fines of up to $137,250, OSHA said in a statement on Thrusday.

"There is no excuse for the lack of attention to accumulation of combustible dusts in any mill or grain elevator, especially given our nation's history of such horrific combustible dust explosions resulting in a high number of employee fatalities," said Charles Adkins, OSHA's regional administrator in Kansas City, Mo. "It is imperative that employers take the necessary steps to eliminate hazards and provide a safe working environment for all their employees to prevent accidents from occurring."

According to the agency in a statement, OSHA's inspection of the Endres facility resulted in three alleged willful and four alleged serious violations. The willful violations address the inappropriate location of an air material separator that lacked explosion venting; an inadequate housekeeping program; and allowing combustible dusts to collect at depths greater than one-eighth of an inch. OSHA issues a willful violation when an employer exhibits plain indifference to, or intentional disregard for, employee safety and health.

OSHA says that the serious violations stem from the company's failure to have an adequate number of exit routes; the lack of a written emergency action plan; an improperly rated powered industrial truck being operated in a hazardous atmosphere; and preventative maintenance records not being maintained. OSHA issues a serious citation when death or serious physical harm is likely to result from a hazard about which an employer knew or should have known.

The company is engaged in recycling inedible food products by milling them into feed for pigs and chickens, the agency said. Endres Processing has 15 business days from receipt of the citations to comply, request an informal conference with OSHA's area director in Wichita, Kan., or contest the findings before the independent Occupational Safety and Health Review Commission.

Lessons Learned: Contempt Orders Issued, St. Louis Employer Ignoring OSHA Citations

(By Sandy Smith, EHS Today Magazine – February 11, 2010)

OSHA announced that contempt of court orders have been issued against Brian Andre, former owner of Andre Tuckpointing and Brickwork (AT&B), Andre Stone and Mason Work Inc. (AS&MW) and Regina Shaw, owner of AS&MW. The U.S. Court of Appeals for the Eighth Circuit issued the contempt orders against the St. Louis-area company and Andre and Shaw for failing to comply with court orders enforcing citations of the Occupational Safety and Health Review Commission (OSHRC).

"Companies that expose employees to hazards, and then blatantly ignore citations requiring correction of those hazards, will not be overlooked," said Charles E. Adkins, OSHA regional administrator in Kansas City, Mo. "Employers must fulfill their responsibility to keep employees safe, as well as satisfy any sanctions levied for failing to do so."

The cases stem from numerous citations OSHA issued to AT&B and its successor, AS&MW, for willful, repeat and serious violations related to fall hazards, scaffolding erection deficiencies, power tool guarding and other hazards in connection with multiple projects in the St. Louis area.

When the companies failed to comply with the court's order enforcing OSHRC's final order, the secretary of labor filed petitions for contempt. As a result, a special master of the Court of Appeals concluded that Brian Andre, AS&MW and Regina Shaw were in contempt of the order, and recommended various sanctions.

The Eighth Circuit substantially accepted the master's recommendations, found all three parties in contempt, and imposed sanctions, which include: Brian Andre, AS&MW and Regina Shaw must pay outstanding monetary penalties, which continue to accrue interest, and other miscellaneous fees, in the current amount of $258,582.08; AS&MW and Regina Shaw must pay a $100 daily penalty, calculated from the time of default, in early 2008, on the OSHRC final order; AS&MW must provide OSHA weekly notification of all current jobs, and known future jobs, at least 72 hours prior to commencement of work for a period of 3 years; and, AS&MW must provide "competent person" training to all people currently and subsequently designated as jobsite "competent persons," prior to beginning any work, and provide the secretary records of such training.

Overcoming Bad Influences

(By Ralph B. White, safetyXchange – February 14, 2010)

We safety people try our hardest to influence behavior constructively. But in trying to change behavior, we are fighting a lifetime of conditioned training. Most workers learn early the habits of hurrying, neglecting anything that slows production and ridiculing those who take due caution in their daily work habits. This conditioning is often reinforced by laziness, when it takes extra effort to work safely. Laziness often greases the skids for creating unsafe conduct.

Once this conditioning becomes a comfortable social "norm" in the workplace it becomes extremely hard to change. Worse yet, as employees move to other jobs, they take the norms with them and infect others in their new workplace - similar to the way the flu is spread at the mall. It's a fact of life that bad habits are much easier to form than good ones.

So how do we, as safety professionals, overcome all of this? Sometimes it pays to guide people to look at why they do the things they do.

Finding Your Workers' Personal Source of Influence

It's a good idea to occasionally work a little introspection into your safety meetings. Ask your audience to think hard about their past work experience and identify (without naming names) a moment in their past when they were told by a co-worker, senior or supervisor that the safety rules didn't matter and merely slowed things down. Maybe they were told that it was too hot to use PPE. Perhaps someone made fun of their safety glasses until they no longer wanted to wear them.

Ask the audience if they've ever attended a safety meeting that was derailed by a cranky or argumentative co-worker who deliberately wanted to be a pain. Sadly, such people do exist; and they teach other, especially younger, workers by their example. As a result, this kind of behavior can create cultural norms that last for years.

An Example

I distinctly remember an incident on my very first job that affected my attitude toward safety. A foreman told me to change some flourescent lights. But instead of using a ladder, he wanted me to be lifted on the forks of a forklift with no fall protection. When I hesitated, he bristled and told me that I would "do it or go home."

I was young and I needed the job. So I did an incredibly stupid thing. I complied. The lesson I learned at the time was that speed was paramount; safety was a luxury. Both co-workers and management expected compliance to give way to the needs of production. Any idea to the contrary was not only ignored but met by threats of retaliation. It was years before I came to see that these norms were wrong and that safety was supremely important. And, at every turn, I resisted challenges to the norm before I finally gave up my unsafe attitudes and habits.

Why It Helps to Reflect on the Past

Clearly, the norm that production is more important than safety didn't do me any good and could have done me serious harm. But these memorable moments in which norms are formed happen all the time. They are what give rise to the safety attitudes we fight against every day. They are reinforced when management turns a blind eye and encourages production volume over sound

safety practices. Outside of training, the only natural counter to this conditioning on the side of safety is when a safety device or procedure dramatically saves someone.

When workers say, "I decided that it wasn't necessary..." or "I don't need that," all they're really doing is voicing what they learned from their teachers. To challenge the lesson, we need to get them to recognize that. Once the memory of that person or event is brought into focus, some workers won't like what they see. You need to ask them gently, "Do you really want to be like that?" If the answer is "no," this is a good start to personal change.

Conclusion

Safety professionals also fall victim to influence. We must be vigilant about this and occasionally reflect to see what's driving our actions. Sometimes we're compelled or told to "tone it down" in our teaching and enforcement, rather than buck the tide. And our job is a never-ending, uphill struggle. We get tired. When this happens, we are susceptible to having our standards eroded. We don't fight for change quite so hard. Compromise creeps into the picture.

As professionals, we should encourage each other to join an organization, professional society, make contacts and friends in the safety field. Subscribe to publications that inform, instruct and reinforce you. Doing so keeps our proper focus and direction. We must be unwavering in the eyes of those we work with and/or for. We must be the influence, not the other way around.

Safety Tidbits

(from "Safety Stuff" by Richard Hawk Inc. http://www.richardhawkinc.com)

- Bowing to pressure from antismoking groups Hasbro took away Mr. Potato Head's pipe in 1987.
- A Michigan study of hunters, with an average age of 55, found that the heart rates of hunters skyrocketed, even doubled in some cases, when they spotted a buck deer, even if they were as still as wax figures.
- It takes .06 seconds for an automotive air bag to fully inflate.
- The following combination of factors would have to occur simultaneously for your elevator to drop full-speed to the bottom of the shaft:
    - Cable failure. And we're not just talking about one cable holding up the car. Most modern elevators have six or more cables attached to them.
    - Power failure. Power shortages and blackouts do happen. But don't sweat it. Most modern building have backup power sources and emergency lights.
    - Computer failure. Modern buildings are computerized. In an emergency such as a fire, elevators can automatically be ordered to the ground floor.
    - Brake failure. All elevators have what have proven to be extremely reliable brake systems in the event of the unthinkable. One less reason not to sweat an elevator ride.
- Nose Paper - When Europe was still wiping its nose on its sleeve, Japan was sneezing into a paper tissue. In 1637, Englishman Peter Mundy wrote of the Japanese: "They blow their noses with a certain soft and tough kind of paper which they carry about them in small pieces, which having used, they fling away as a filthy thing."

In the early seventeenth century, when Hasekura Rokuemon, a Japanese envoy, visited France, he amazed Westerners by using a hanagami ("nose paper"). In St. Tropez, the locals rushed to pick up his used handkerchiefs and even fought over them. A French account of the visit tells of Hasekura's diplomacy: "Amused at the people's freakishness, the envoy seemed to have used more paper handkerchiefs than was actually necessary so as to please the people."

Kleenex, the first "nose tissues" made in the United States, did not appear until 1924.