



ASSE's 100th Anniversary Essay Contest Winning Entry

TWO PAPER CUPS WITH A STRING

By Joann Robertson, ASSE Long Island Chapter

When I contemplated the largest challenge facing our profession, I considered broad topics, such as what motivates employees to work safely or how to prevent back injuries.

Then I realized that even if all employees worldwide would wear their personal protective equipment as needed for just 1 hour, it would be an unprecedented achievement. This event would be legendary, and stories about this feat would be passed from one generation of safety professionals to the next for decades.

But to me, the biggest challenge was obvious, and much simpler to solve. It revolves around the issue that safety professionals do not communicate clearly, and allow confusion and crossed wires to occur. We rely too heavily on technology, and need to refocus on improving our communication skills in order to strengthen our relationships so we can better relate to and protect clients, coworkers and colleagues.

My workplace is not exotic or adventurous, since it is a traditional office environment. When I go to work each day, I wear a key card to gain access into the building, dress casually on Fridays and discuss the previous night's television shows.

But my department's concern for clients and their safety remains a priority. This unifying fact allows me to discuss what I feel is the largest challenge in a way to which all safety professionals can relate.

Consider these examples of crossed wires. When the risk management staff holds a department meeting, we gather in a large conference room. However, some of my coworkers are not always able to follow the conversation since others are speaking in the "foreign language" of safety acronyms. If my entire department would stop speaking this way, new or less-experienced employees would gain the full benefit from these meetings. In addition, other coworkers would have a better understanding of our department.

Another example revolves around snowy winter mornings that cause the office to close or prompt management to delay opening. Through technology, supervisors need not rely on a series of frantic telephone calls; instead, they use technology to inform the staff about what the plan. When a timely decision is not made and the announcement comes too late, my coworkers and I will head out on slippery roads too soon, instead of taking the time to properly dig out and wait for the roads to be safely cleared before heading to work.

When teaching a defensive driving class, I heard another story about a common misunderstanding involving technology from a police officer. Apparently, many drivers, especially older drivers, have become overly reliant on their directional devices and follow them unquestioningly. The officer stated that some motorists have put themselves in immediate danger by "taking the next right or left," as instructed and have ended up turning their vehicles onto railroad tracks, where they must await rescue.

At a friend's workplace, while interviewing a candidate who lived some distance away using new technology, a potential employee was asked by a top executive of the firm, "Tell me something I don't know about you." Mistakenly, the applicant replied, "I could drink all of my coworkers under the table at my last job." This statement illustrates how an improved understanding of communication could only benefit some new safety professionals.

This same workplace also had an annual meeting that was recorded. All employees were asked by the chief executive officer to rate the firm, and they raised their hands as different letter grades were mentioned. Some employees raised their hands for the poorest letter grades, leaving us to wonder, "How could these employees not understand that this recording could be viewed for years to come and their responses could directly impact their future?"

Frequently, departments need to work more directly together. If the risk management staff books an event for clients, we must remember to invite coworkers who would like to participate. Other times, the client receives the latest safety newsletter from our firm before staff does. Nothing is more annoying than when a client knows more than you do.

Another constant workplace communication trap is the “black hole” of the conference call. Have you ever experienced it? This vacuum-like event can be defined as the time you spend on a call, when no one is listening or can make a decision. Similar problems often occur when a large group repeatedly tries to schedule an event by e-mail, resulting in a never-ending string of messages, with no actual plan or date being chosen.

As you would assume, a meeting conducted in person is the best method to communicate effectively. A face-to-face meeting is not always possible, but is the most reliable to ensure that important information is not lost, especially if the meeting involves:

- observing safety concerns;
- following subtle clues, such as the speaker’s tone of voice or body language;
- brainstorming a complicated problem.

Since proper communication is the key when it comes to dealings in the workplace, here are some tips:

- Do not speak or write using acronyms.
- When you attend a meeting, sit with people you have not met before to network.
- Answer all the questions in each e-mail when responding to the sender.
- Make time to call and speak to a coworkers or client each day to stay more connected.
- At the end of a conference call, address each person individually to summarize all action items and see whether any questions remain.
- If you receive a task by e-mail, always reply to the sender when the task is completed.
- If you do not understand an e-mail, fax or text message, make the effort to pick up the telephone or speak to the person directly.
- After a meeting, prepare minutes and highlight the action items for each participant.

In conclusion, take the time to consider what communication challenges face your workplace and how they can be overcome. After all preventing global warming and protecting the earth are certainly larger challenges, but this problem reduces the effectiveness of all safety professionals.

What is the greatest challenge facing the SH&E professional in the 21st Century?

Debra L. McDaniel, CSP

As we celebrate the 100th Anniversary of the American Society of Safety Engineers we cannot help but to look back in time and reflect on the accomplishments and challenges of our predecessors. Just as safety professionals look back each day on actions taken, conversations elicited, interventions initiated and paper work completed for our cause, we look back in history to the work completed by others to protect people, property and the environment.

As we are now into the 21st century now could those who have gone before us ever imagined today's technology? Could those men and women have possibly imagined the flattening of the world and incredible speed at which we communicate? Technology in this century continues to change at an unprecedented rate. The author truly believes that the ability of the workforce of tomorrow to keep pace with the technological changes in our world will be our greatest challenge in this century.

The influences of technology have so heavily infiltrated our daily lives that the average person may not realize the impact. Today's routine tasks of driving a car, making a phone call or watching television have been greatly impacted by technology that was inconceivable just fifty years ago. Even if the washing machine breaks down we must call upon a qualified technician to repair this of our most basic daily tools. These advances in all aspects of our lives calls for workers with the technical skills and education to perform these tasks while keeping themselves and the environment safe.

The twentieth century can serve as our school master in the world of safety, health and environmental protection. We have experienced the greatest technological change in the previous one hundred years as has been experienced in the past one thousand years. Our grandparents have gone from horse drawn carriages and the telegraph to the Concord jet and Skype®. In the year 2000 there were nearly 90 million cell phones in use in the U.S. In 2010 there were nearly 300 million cell phones in use and less than half of all households had traditional land lines. Yet Creative Destruction is evident in our society as we see how the technology developed for building railroads from 1880-1910 eliminated the pony express. Broadband signals are replacing fiber optics just as they replaced telephone lines and telegraph cables.

As the work place changes, tools change and hazards change. The ability to identify, predict, and mitigate new hazards will require knowledge and skills commiserate with the work place in any arena. As workers, tools, materials and inputs become more sophisticated, so too must the SH&E profession become more sophisticated, more educated and more skilled. As we strive to uncover and unharness new energy sources to fuel the world so must we uncover and unharness new skills and resolutions for the SH&E professional to address current and future challenges.

The trial we now face is this; has our workforce changed as profoundly and to the extent of that of technology in the past century? This is a great contest but who is winning? We certainly have an amazing wealth of educational resources at our disposal in this early part of the 21st century. The computer age has brought the world of books, journals,

manuals, and education to our finger tips. We now have this access to information in our homes with virtual colleges, on-line training, simulators and instant face to face communication. Educational opportunities have never been greater in our history. But along with advancement have we paid too great a price for technology at the cost of literacy? Have we “dumbed down” our work force by allowing machines to think for us or by increasing work place regulations that rely more on management oversight than skill or decision making? Is the average American worker sufficiently educated and skilled to the degree required by his or her task? If we truly believe all workplace injuries and illnesses can (and should) be prevented what is the missing link?

Workers of the previous century did not know the acute or chronic hazards of working with lead, asbestos or other chemicals. We did not have the technology to deal with ergonomic hazards or making processes safer through design in the past. We today do not yet know the long term effects of wind park technology on the global climate or that of Nano particles in labs. We do not yet know the impact to our health from bioengineered grains or the long term side effects of selective serotonin reuptake inhibitors (SSRIs) or psychostimulant drugs like Ritalin® for example.

With all of the changes in technology, in all aspects of our lives, the SHE professional will face challenges not previously experienced in our history. How will those of us currently in the field prepare ourselves and those who will enter our field? Will we be able to successfully meet the demands of the 21st century? In the words of Elton Truebolld, “Make no small plans, for they have no power to move men’s hearts. Unless our proposals are bold, they will be ineffective”.

As previously discussed, the greatest challenge for those challenged to protect people, property and the environment will be striving to keep pace with changing technology. The most challenging aspects of this will be: increasing the skill and education level to that of the work place; recruiting, integrating, embracing those from different cultures and background continue fill vacancies in the technical work force; and to learn to identify, predict and mitigate previously unidentified hazards.

We must “learn the past, watch the present, and create the future.” The following suggestions are certainly open for discussion and debate but the author believes a plan of action must be established now to address our future needs. In regards to increasing the skill and education level to that of the work place we must reach out sooner and be more aggressive. We must call on all branches of the ASSE to develop materials for outreach to 6th grade students, 11th grade career day events and college/trade school career days. We must recruit tomorrow’s safety leaders as passionately as athletic coaches watching players in junior high and high school. Currently schools have all types of athletics, music, and academic competitions. We must develop a “safety project fair” for middle and high school aged students. This can be approached in a “science fair” atmosphere and be sponsored by the local ASSE chapter. The ASSE should partner with government and private business to provide prize money and scholarships to entice our future practitioners into a future career in SH&E.

We should also expand the use of the “Safety Suitcase” into that of the “Industrial Hygiene Suitcase”, “Food Service Suitcase”, “Risk Management Suitcase” or any practice specialty suitcase. This program could spark the interest or curiosity of young students and plant a seed of a future career in SH&E. These types of presentations could also be offered to non-traditional students attending night schools, local community colleges, alternatives schools, at local job fairs or as presentation for civic organizations. These events will only be as good as the persons presenting them. At the PDC and Seminar-Fest there should be session on using the safety suitcase for different audiences (6th grade, 11th grade career days and college/trade schools, non-traditional students, etc.) to enable those so inclined to recruit for our field.

In regards to recruiting, integrating and embracing those from different cultures as we continue to fill vacancies in the “technical work force” we must make it easier for those outside our borders to join our organization, especially in developing countries where our practices are so deeply needed. The delegation to China last year was exactly the kind of activity in which the society should be involved. ASSE dues and fees must be based closely on the local average income and experience level in other countries. The author has sponsored membership for a young man in Nigeria. He is a university graduate and cannot afford the annual dues for his ASSE membership. He realizes the value his membership and as it gives him a higher status in his work place. We must make it realistic for those just entering the field to be able to afford to be members. We have reduced rates for students. We should extend those rates for members with 3 years of experience or less and lower rates for low income countries to increase opportunities. We should also offer discounted rates to members who have been right sized in the work force.

If we address the previous two concerns then an expected outcome would be to create more educated and more highly skilled professionals. This new workforce will be required to more quickly learn to identify, predict and mitigate previously unidentified hazards. We must call upon the Academics Specialty to assist with this challenge. We must work with technical schools and universities in developing curriculum that includes more emphasis on safety in not only engineering and science, but also in business. We must call on our society to more adequately use and distribute our body of knowledge for prevention through education. It would be amazing to see a general education requirement for a three hour course on the basics of SH&E at every post-secondary education establishment.

We must call upon the Young Professionals common interest group for program ideas & suggestions to entice undecided college majors or those looking for work into safety. We must call on all common interest groups to reach out to meet the needs of current and potential members. We must meet current and future needs by sharing our body of knowledge in a way that serves and prepares for challenges of this century.

Just as our organization’s original name was changed in 1914 it is time to consider changing the name. We are now an international organization and will likely become more so in the future. The term “Society” feels outdated and tied to the 20th century. We

are not only safety professionals, but strive to protect people, property and the environment. Our name should reflect our future and the challenges we confront as well as the face of our organization.

The 21st century belongs to us now. The ability of the workforce of tomorrow to keep pace with the technological changes in our world will be our greatest challenge in this century including: increasing the skill and education level to that of the work place; recruiting, integrating, embracing those from different cultures and background continue fill vacancies in the technical work force; and learning to identify, predict and mitigate previously unidentified hazards. If we begin our safety education sooner and continue to expose students at all levels we plant the seed of expectation of success. If we call upon our own expertise and body of knowledge to create a path forward through curricula and guidance we advance an expectation of success. If we grease the wheels of international technical expertise into our arena we ripen expectation of success. If we tout ourselves as an international teaching and learning organization that welcomes all levels of the profession we create an expectation of success. The African proverb “for tomorrow belongs to the people who prepare for it today” has never been truer.

Challenges of the Safety Professional in the 21st Century

By: Troy Bridges-Safety Consultant at Pinnacol Assurance

If we look at the safety professional in the 21st century, one of the greatest challenges being faced is the fact that businesses are moving to operate more efficiently with fewer resources. The lean business model has created a greater workload on the safety professional with a diminishing budget, staff, and resources. According to Charlie Gifford, in an article written in *InTech* (Feb 2008),

Lean manufacturing methodologies are a major part of a continuous improvement business model. North American and European industries are applying it to compete with low-cost labor. Lean has to do with reducing waste in order to improve all key measures of manufacturing performance: quality, asset utilization, safety, materials management, cost, and delivery. (Vol. 55, Iss. 2; pg. 64)

Due to these lean management processes, being incorporated by many corporate entities, safety departments are typically stretched thin and working with skeleton crews. Staff members are required to cover larger territories, audit more facilities, create new training programs and maintain corporate compliance; all of this with less. Therefore, it is even more important that safety professionals have access to more information, current changes in regulations, training and educational resources faster and cheaper.

In today's world of high tech equipment, faster internet speeds, mobile access and virtually instant communication, gathering information for the safety professional is more complex than ever before. The vast amount of information available is often overwhelming, and sorting through what is valid and what is fiction can be a daunting

task. Although there are a great number of resources available to the safety professional that can assist in making work easier, finding a viable solution that fits within the corporate budget constraints can be maddening. Finding the time, in an already overloaded schedule, to research and beta-test solutions is often not possible.

So how do safety professionals sift through the informational gauntlet to obtain those valuable resources? One possible solution is to get more involved with the local ASSE chapter and utilize the networking and professional expertise available. Utilizing fellow safety professionals in addressing existing hazards or conditions can not only aid in finding viable solutions, but allows for benchmarking opportunities to improve business operations in other areas as well. Typically fellow safety professionals have experienced similar situations and have come up with viable solutions to those problems. Why recreate the wheel if there has already been a hazard analysis conducted and root causes identified that can be applied to your specific situation? Utilize your peers and learn from their experiences and leave yourself more time to focus on other issues or job tasks.

Another alternative is to join a committee or become an officer within the local ASSE chapter and develop resources that will further enhance the membership benefits and resources available to all members. Safety professionals should also look into becoming members of other professional organizations or social groups that can add value and that have tools available to make better use of their time. Such organizations and social groups could include the local Chamber-of-Commerce, the Association of General Contractors, the American Society for Training & Development, LinkedIn social groups and networks, the American Management Association, and many others.

In addition to utilizing peer groups and social media, safety professionals should take advantage of the other resources available to them for conducting training and education for their employees. These resources include contacting the company's insurance carriers and agents to perform training or accessing safety databases for employee education. Many carriers and agents have personnel and resources available, at little or no additional cost to the client, for these services. Utilizing these resources not only takes some of the burden off of the corporate safety professional but gives employees alternative perspectives on safety and regulatory issues. Other resources that can be tapped are the vendors that a company purchases products from. Many vendors and sales professionals are willing to conduct free product and safety related training just for buying their products. These training sessions can be very effective since they apply specifically to those devices that the employees use and work with. Instead of having training that is generic and may not relate to what an employee does routinely, these vendors can make the content relevant and applicable; all of which equates to better comprehension and retention of the information provided.

With technology advancing at such an exponential rate, cost effective solutions are ever present in our society. Take for instance the utilization of the iPhone and Droid devices and the applications (apps) available for free or minimal cost. Currently there are not many selections of safety related apps available, but given time, those resources will become greater and be more efficient and effective. Partnering with IT professionals to develop these resources could not only make the auditing process easier, but allow for additional income to the organization through the sale and publication of these apps. In addition to creating apps for the safety professional, utilizing the instant communication,

text and web features can be effective tools to communicate with employees. Instead of getting a group of employees together for a safety meeting or 'toolbox talk', send out a mass text highlighting a safety message to the employees. Utilize the email feature and send out emails that contain relevant safety material and links to pertinent information. Post short video clips online or in a social media program that employees can access from their mobile devices. Create a Twitter or blog post that keeps employees up to date on current affairs and safety hazards or messages from management stating the importance of safety. Workers today are more technologically adept and prefer short frequent communication as compared to the traditional class-room training methods. Utilizing these methods will not only reach a broader audience faster, but require less time and effort from the safety professional to create more traditional programs.

Safety professionals today are required to become more diverse and well acquainted with all aspects of safety within the organization and are expected to keep up-to-date with current regulations and resources. Utilizing the many technological resources available and creating a strong social networking base can add to the knowledge and skill of any safety professional. The challenge is to find those resources that will not only aid in completing the task assignments, but make sense within the corporate lean business model.

Reference:

Gifford, Charlie. *A lean, mean, continuous improvement machine*. InTech. Durham: Feb 2008. Vol. 55, Iss. 2; p. 64 (1 page)

The Greatest HS&E Challenge

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As an individual involved mostly with safety in the oilfield for the past thirty-two years, the one thing that I have learned is that the biggest challenge is, wait for it, yes you guessed it, us! What I mean is that people are the problem. Most individual's perception of accidents, is that the job is dangerous and so they think that the job, or the hazard, is the cause of the injury/accident. Walking the "mile" in these shoes, I have come to see that it is not the job we are required to perform, nor the hazards encountered while doing that job that causes accidents. It is the worker involved that does not work in a manner that would avoid exposure to the hazard thus putting them in the "line of fire". I am a firm believer that accidents can be prevented, but a rule or a law on its own will not prevent them. The only sure fire preventative method is for workers to not only do their jobs, but to plan and execute them safely and obey those rules/laws that were designed to protect us. I realize that workers do not intentionally put themselves in harm's way, but unless they have the right attitude and do the right thing, then they are setting themselves up for failure and when you're talking about the hazards and what they can do to us, the failure I refer to is failing to keep on living or worse, failing to have any quality of life because of a life altering injury.

My approach to remedy this problem is actually pretty simple. I make sure that everyone who crosses my path (or classroom) knows that the most important role they play in life is not an employee, but a person. We work for ourselves, using an employer to make the money to live on. I am a Safety Consultant and my job allows me to teach people how to work safe. I have the awesome opportunity to influence the lives of many men and women which enables them to not only

improve their work habits so that they can support themselves and their families, but also to be able to have a quality of life in order to enjoy the paycheck with the family they are working so hard to support. I am a firm believer that we can have our cake and eat it too! I am very committed to my profession because, through experience, I have seen more than my share of people suffer due to accidents, and I know that having accidents is not supposed to be an acceptable part of the job.

So how do we get people to change, you ask? You have to make sure that they know their worth as a person first, then an employee. When I am in front of a group of students, prior to starting the presentation on the required class curriculum, I start off talking to them about what I call “The Three Lessons That I Have Learned”. Lesson one is that you are the most important vested interest in your life. I normally make a joke and tell them that there is no one that loves them like they love themselves, except for maybe their mom. Getting them to realize that they are always, have always been and will always be in complete control of their actions is crucial. What I ask the student is this, “Can anyone make you do anything”? Many times the answer is yes, that the boss makes them do things or their supervisor can make them do a job even if it is not safe. In a very respectful manner, I then ask the same question, but with emphasis on “make”. I explain to them, that you can be asked or even told to do something, but actually, the individual themselves is the only person in the world that can make them do anything. We all have choices and our actions are truly our own, a result of our own choices. I realize that many times, people are intimidated to do whatever they have to in order to get the job done (or else they won’t have a job). My answer to this is to remind them of their worth. Yes, you want to do your job, but never at the expense of your life, or the quality of it. My suggestion to them is when you are in this type of situation, explain in a professional and positive manner, the safety concerns that you have, but also be able and willing to give them a safe solution. This enables the job to be completed and to have it done in a safe manner. This allows the worker and the client to have their cake and eat it too!

Lesson two is that even though they can't make anyone else do anything (just like there is no one that could make them do anything), they are responsible for the safety of their co-workers. Now I know that sounds contradictory, but what I try to get across to them is that they are their "brother's keeper". Your second vested interest is each other. Anyone with any strength of character, what I refer to as a good decent human being, will want to look out for the other guy. I can't imagine anything greater than stopping someone from getting hurt. Behavior Based Safety programs are a great tool, when presented in a positive manner, to help prevent accidents and injuries. When I'm discussing this with the students, I explain to them that not everyone will be happy about their "interventions". On occasion, someone may get angry when you approach them and bring to their attention the unsafe action they are about to perform. Reminding them that they can make new friends, but they can't bring an old friend back from the grave, gives them incentive to find the courage to speak up when necessary and save a life. Living with regret because they didn't step up and stop the job is a far greater damaging emotion than having your feelings hurt because the person you tried to help is mad at you.

For the final lesson, or lesson three, I tell the students that their third vested interest is their money. So many people look down on big business, accusing them of "being in it for the money" or "it's all about money". My question to them is "Why are you working?" This normally brings a few smiles, because I have made them realize that they also, are in it for the money. We all like a paycheck or two. Showing their worth again, I empathize with them, explaining that I know how hard they work for that paycheck, in that they are not given a single penny, but work very hard to earn their keep. Due to the fact that most people work to support their families, I stress to them that they deserve to be around to enjoy that check with people they love and work hard to support. It's a win-win for everyone. The job gets done and no one gets hurt. With this said, the fact that a quality, safe job was performed allows the company (and individual) to continue to work for the client, not only for that job, but for others to come. We have to stress to the employee that he/she should take their job personally. If we

don't work safe, allowing people to get hurt or equipment to become damaged, ultimately, everyone is affected by the consequences. If the company the student works for has a high recordable rate, due to excessive or severe accidents, clients will not hire them to work. This will cause a cash flow problem, meaning cash will not be flowing in. Another major problem will be the large amount of money going out of the door to pay for such things as doctor or hospital bills, court or attorney fees, equipment repair or replacement fees, elevated workers compensation insurance premiums and of course, many other hidden cost. I explain to the students, it doesn't take a rocket scientist to figure out that when money is going out faster than it's coming in, the next thing to go out is them! Explaining to them how important everything they do is to the bottom line of "their" company is crucial to its success which means their success.

Once you've earned a bit of respect from your perspective audience, by showing them respect, you have their attention and are much more able to communicate to them what you want them to know. Someone once told me that people will not care about what you know until they know you care. I believe this to be true. When we want to influence people, to get them to work in a safe manner, it is our responsibility to communicate in a way that makes them want it as much as you do. I try to set the tone at the beginning of the class by stating that the most important goal for that day is not passing the test in the class. This will only provide them a card and a certificate. Gaining the knowledge from the class, using it on the job and being able to pass the test of completing a safe job, allows them to go home safe, which is the most important goal. Now the atmosphere is conducive to learning because the day is about commitment, not compliance. Treating people with respect and providing them with quality training, presented in a manner that promotes participation and a yearning to learn, allows me to influence their life. During all of my presentations, we discuss past accidents pertaining to the subject matter at hand. After explaining what happened and why it happened I ask the group "How was that work related?" Normally I get a few blank stares, and then I tell them how it was "work" related. The person was at work! The root cause of the accident was behavior related, meaning we, the

people, could have made a difference. The job or the hazard, on its own, cannot hurt us. We have to put ourselves in its line of fire in order for it to hurt us. After using this analogy for several accidents, the students begin to grasp the message that I am trying to get across. Our attitude and our behavior have to change if we want a safe work environment. At that point I know I have their attention so I get to help save lives and, wait for it, I get paid to do what I love! I get my cake and I get to eat it too!

ASSE Safety Essay Contest Entry by Tim Delhagen CHST

Construction safety in 2011 and beyond becomes even more important because of new contractor selection methods.

THE CHALLENGE:

Our safety department is most challenged with maintaining a great safety record because getting new business depends on it!

The contractor selection process for some schools and municipal projects has changed from “low bid gets the job to: (GC) General Contractor is selected by owners via a two phase best value criteria.”

As part of this process the GC is evaluated and selected by the Owner through a pre-qualification screening process prior to getting onto the approved contractor list, which is referred to as the “Short List”. This contractor selection process includes assessing the GC previous work experience, conducting construction team interviews, submitting technical proposals that explain how the work will be done, and scrutiny of the GC’s safety record. Particularity with regard to OSHA citations, recordable accident rates and loss time accident rates compared to (BLS) Bureau of Labor Statistics averages. Owners also review (EMR) Experience Modification Rate scores, including (W/C) Workman’s Compensation claims with dollar value and quantity of builders risk claims.

There is a point scoring system for each category that favors a safe contractor’s record because many large municipal projects are (OCIP) Owner Controlled Insurance Program wraps. They require the owner to carry the W/C premiums and pay the deductibles. Consequently, the better the contractor’s record, the more points the firm will score in the owner selection process, and ultimately lead to new work.

As for subcontractors hired by the general contractor, they too must meet a safety standard set by the owner in the specifications. Their EMR must be 1.0 or below as required in the education code 17250 for design/build construction of schools in California.

A general contractor's safety record in the proposal process is typically worth 5% of the total 100 points awarded. Usually the point spread between the selected contractor's score and second place is less than 3% of the total score. Proving a good safety record can get you the job! It brings new meaning to the old cliché "Safety Pays"

The following table is from LAUSD Dorsey High School Design/Build bid documents:

SAFETY (Possible 5 points)		
Item	Description	MAXIMUM SCORE
EMR	This section for EMR will have a total weight of 2%. The proposer with the lowest EMR will receive 2 points and that EMR will be used as the numerator to establish the other Proposers scores, i.e., (lowest EMR)/other Proposers' EMR) X 2 points. If the EMR for the most recent three-year period is greater than 1.00, the Proposer will receive 0 points.	2
TRIR	This section for TRIR will have a total weight of 1%. The Proposer with the lowest TRIR will receive 1 point and that TRIR will be used as the numerator to establish the other Proposers scores, i.e., (Lowest TRIR/Other Proposers' TRIR X 1 Point.	1
Fatalities	Proposers with zero fatalities within last 10 years, verified by OSHA 1000300 logs, will receive 1 point. Proposers with 1 or more fatalities within last 10 year, verified by OSHA 200300 logs, will receive 0 points.	1
OSHA Citations	Proposers with zero serious or willful citations will receive 1 point. Proposers with one of more serious or willful citations will receive 0 points.	1
TOTAL		5

The contractors that have poor safety records are prohibited from advancing to the "short list" let alone be selected to do the project. Now, a safety department actually can contribute to the process of acquisition of new

work. The safety department now adds value to our employers in marketing construction services that is measurable.

It is evident that we must have effective policies and procedures in place that ensure a safety record that meets and exceeds the owners' requirements. Our success in maintaining a great safety record acceptable to owners is confirmed in the previously ASSE published article shown below.

Pinner Construction Co. Inc. has received The Gold Excellence in Safety Award from (LAUSD) Los Angeles Unified School District and Liberty Mutual Insurance Company for being 24% lower in recordable incident rate and 150% lower in lost-time work case rate than the Bureau of Labor Statistics national averages for general contractors. The company was the general contractor for six LAUSD school projects, logging 632,140 work hours from April 30, 2009, through May 1, 2010. The company's Safety Director Tim Delhagen, CHST is a member of the ASSE Los Angeles Chapter and the Construction Practice Specialty.

"There's no better measure of the core values of a company than its ability to keep its workers safe and healthy," said Tim Delhagen CHST Safety Director for Pinner Construction Company, Inc.

The Solution:

Many construction company safe work practices include subcontractor pre screening, and (JSA) Job Safety Analysis submitted prior to beginning of task work by subcontractors. Normally they have a reward & discipline programs along with daily jobsite safety inspections.

Pinner Construction Company, Inc. believes that it is the combination and enforcement of these procedures and passing our pre-requisite subcontractor pre-qualification that will produce excellent results. We require all subcontractor foremen to have completed a 30- hour OSHA construction training class. The foremen are responsible for assigning the work tasks and completing them within the scheduled time frame. Subcontractors must complete a quality installation that passes inspections along with safety responsibilities conforming to the OCIP requirements.

We also require them to hold daily JSA meetings with their employees and explain the hazard and controls associated with the tasks they assigned that day. Our full time, OSHA 500 certified on-site safety officer can easily verify this by simple interview questions of the employee during the task operation. “What did your boss tell you about the safe work practices of your task this morning?”

Repeated employee safety violations will result in worker removal from the job. When we observe repeated safety violation of the employees of the same crew. It indicates to us that the foreman is not successfully getting his employees to work safely. We will remove the foreman after sufficient warnings and require the replacement of that foreman with one who can conform to above and beyond safety regulations.

We offer a \$100-300 reward weekly to a subcontractor foreman who writes and performs the best JSA of that week, and a monthly barbeque lunch for everyone on the job site when we have a no-incident month. Basically the subcontractor’s foremen are in control of their own destiny to receive a reward for complying, or removal for failure. Their daily safe work practices will determine the safety record of the project.

Our jobsite inspections are completed using a Blackberry on Predictive Solutions web site (formally dbo2). This program allows us to, capture safety violations and create reports for distribution to sub contractor management. At both owner’s meeting and foremen meetings we show the safety violations and use this data as lessons learned that week. Safety violations are either unsafe employee acts or unsafe conditions that existed and easily could have resulted in an accident. Careful review of recorded violations and corrective actions will help everyone not to repeat the unsafe act or condition again.

In Summary:

- A general contractor’s income cannot be thwarted by poor safety performance of its subcontractors.
- It is imperative to know that in these tough economic times that survival of general contractors significantly depends on their safety record.

- It behooves a subcontractor to step up to the safety challenges in the 21 first century too. Typically the general contractor's value is determined by the strength of his subcontractors.
- Therefore subcontractor's survival is also dependent on their safety record to remain in business. General contractors can only hire subcontractors that meet owner's safety requirements.

All construction employees must embrace safety with a new attitude and behavior in 2011 and beyond.

We must work safely and save lives while we rebuild America's infrastructure and provide safe employment for our citizens. Owners demand a quality building erected on time without injury to employees. Safety in the 21 first century must comply.

New and effective policies and procedures must be implemented so that historic accident rates decline. We have to partner with owners and achieve zero tolerance for accidents because our employee's lives depend on our success.

©

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“What Is the Greatest Challenge Facing the SH&E Profession in the 21st Century?”

- *By Ashok Garlapati, ASSE Membership No- 28932*
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I am associated with Safety Health and Environment (SH&E) profession over a period of two decades. In fact it was my dream profession during my Graduation and chosen this field. I have been working as a SH&E Consultant and presently associated with SH&E Management of Oil & Gas Industry over a period of two decades. My journey in the SH&E Profession further enlightened with my association with American Society of Safety Engineers (ASSE) since the year 2000. I am pleased and proud that I am with ASSE for a period of 1/10th of its history. I take this opportunity to thank ASSE for inviting Essay on the topic “Greatest challenge facing the SH&E profession in the 21st Century”.

I personally feel that the challenges for the SH&E Profession will vary from Country to Country as the development and implementation of SH&E regulations are varying across the World, across the industry etc. For eg,. I am now stationed in Kuwait and mostly with Oil & Gas industry; certainly the SH&E challenges are different in Kuwait than in USA and other developing Countries and even it vary from Oil & Gas industry to other industries. This is due to the fact that the SH&E regulations / practices are not introduced around the World at the same time and the ground realities are certainly different.

In every Country, it has taken its own pace in introducing the SH&E practices and regulations as the industrialization taken place in the respective countries. But there is one challenge which is common across all industries, all countries and all over the World, which I would like to focus in my Essay.

During my experience of two decades in the Oil & Gas Industry, focusing on the SH&E Management, involved in many major incident investigations. We could find many root causes but one root cause is common among all incidents ie complacency and Behavioral issues. What I would like to say is that whatever systems we keep in place, whatever SH&E procedures and regulations we keep in place, one need to change the behavior and mindset of the workmen to work with these procedures / systems. This is a big Challenge for SH&E Professionals. It is natural for human beings as they do the job again and again, they get so much involved with it and become complacent with the activities. This complacency leads them to do the jobs subconsciously. This happens to us every day as we go down the stairs as we use elevators to reach our office or home. We remember only few things what is happening around us when we do repetitive jobs. This is the time; something goes wrong and become the one of the leading cause for the major incident in everyday's life. In fact, when we conduct incident investigations, we always looks in to these issues particularly whether all control systems are in place, all procedures are in place or is it because of behavioral issues, complacency etc. We, then recommend the Management to establish a program to address such behavioral issues. Certainly, Management will take such issues very seriously as these incidents contributes for higher insurance premiums, lawsuit for negligence of employer, company reputation etc. Such

status in the Company will further encourage the management to focus more on the behavioral and complacency issues.

When top Management considers and committed to implement these programs in the Company with a single objective of improving the behavior of workforce, it becomes the SH&E Professional responsibility to drive these initiatives. As the things become alright and again workforce will tend to slag and start becoming complacent again. It is the SH&E professionals important responsibility to keep the workforce engaged consistently and continuously as the operational Staff will always try to reach their targets delineating from SH&E requirements / practices.

Also another important reason is Supervisors always follow their Top Management directives, whether to focus more on safe operations or reaching the production targets by-passing critical SH&E requirements. This is the situation, when efforts towards injury and incident prevention reduce while focusing on production / operational targets. What I want to indicate that the workforce commitment towards safe practices keeps on varying and highly influenced by external factors. So, it is the responsibility of SH&E Professionals to keep up the high spirits of workforce while balancing the production and SH&E requirements.

Also as we see today, just after any major incident in any Organization, every one wakes up... particularly, Management orders for a thorough SH&E inspection by outside Consultants, SH&E Experts etc to find out all systems are in place. how we can tackle the gaps if any. They wanted to ensure that same thing will not recur by reviewing every aspect of work planning, execution, commissioning, during

regular operational phases etc. But only the final outcome again is the behavior of the workforce which is not consistent and it keeps changing from situation to situation and time to time. We need to ensure that consistent and continuous efforts are required to manage this issue which is a big challenge for SH&E professionals.

In my opinion, the biggest challenge for SH&E Professionals in the 21st Century is managing the Behavior of the employees and avoiding complacency factor. Complacency makes it easier for workforce to take their eyes and mind off task. Not watching what they are doing and not thinking about what they are doing can easily lead to product damage, minor injuries and major injuries.

Complacency affects the entire organization performance, too often individuals and companies become complacent when it comes to safety. Managers are satisfied with middle-of-the-road safety performance and do not work to improve by raising awareness and eliminating the potential for injury. Employees are content and are not attentive to their work environments. They become convinced that management is not concerned about safety. They begin to think they are not responsible for their own safety. Over a period of time, the entire organization gives little meaningful attention to safety health & environment requirements.

The result is that employees begin to get in a hurry and take shortcuts on the job. They are more focused on production and getting the job done than getting it done safely. That attitude becomes an organizational norm. Near misses go

unreported. No one wants to take the time to fill out forms and employees don't understand the connection between sharing information and eliminating injuries.. The number of injuries increases and they become more severe. Everyone becomes frustrated. Employees blame management and management blames employees, yet no one is willing to take action to improve the situation. Unfortunately, it often takes a fatal injury to cause everyone to focus on safety. Don't let this happen to your organization.

Earlier research studies indicates that many incidents occur because people are distracted and do not pay attention to their environment and what is going on around them. Managers often fall into the same trap – they become distracted by pressing issues such as the organization's need to increase productivity, improve quality and raise profits. They stop paying attention to the importance of SH&E practices in the organization and become blinded to the fact that the lack of attention to safety performance is injuring the organization in the long run. In other words, they become complacent.

When Managers and Supervisors do not make SH&E requirements a top priority in the Organization, it is easy for employees to make personal safety a low priority. Then incidents and injuries occur with increasing frequency. Managers must renew their commitment to the SH&E practices/ processes and employees must get involved and engaged to avoid the complacency.

As we know any international Standard (either ISO 14001- Environmental Management System or OHSAS 18000 – Occupational Health and Safety Assessment Series) keeps the Leadership and Management Commitment as the

first element and mandatory requirement as well. Because, only top management can drive any change in the Organization but it requires good qualified tools. SH&E Professionals are the best tools available for the Management to bring the change in any organization, engage the workforce and ensure that SH&E systems are in place and issues related to complacency are avoided.

It takes more than just saying that Management is committed; they have to put actions. Management can demonstrate their commitment to SH&E in a number of ways. First and foremost is that the all Management employees including Supervisors must follow the company's SH&E policies, regularly engage with employees by attending SH&E meetings. Take time to walk around and discuss with employees in their workplaces, discuss with them about their concern for SH&E requirements. Advise concerned department to take actions and follow-up with them to build on their confidence levels. Management shall ensure the periodic review of SH&E performance, root causes and the review of the controls in place and corrective actions. Ensure integration of SH&E requirements into all aspects of management planning. During the organizational planning process, ensure including KPMs (Key Performance Measures) for improving SH&E performance, consider key issues from the past incidents while arriving at KPMs, and provide adequate budget for SH&E improvement. Another important area to be focused is to avoid complacency by ensuring the communication of organization's efforts to improve SH&E performance. Ensure employees are involved in the process so that Management can focus on the real root causes by designing the corrective measures and also recognition of employees makes a huge difference.

Management at all levels of the organization can have a profound effect on the SH&E culture of an organization. Once, employees see the demonstration of Supervisors and Managers taking SH&E practices seriously, employees in turn will be more committed further. It energizes whole organization's SH&E improvement efforts with employee involvement. Employee involvement starts from providing them the SH&E awareness, reporting of hazardous conditions, near misses & incidents, attending SH&E meetings, appointing them in the SH&E committees, involving them in the incident investigation committees, engaging them in equipment improvement projects, encourage employees, whose proposals / ideas will increase the factor of SH&E performance and avoid complacency to create a SH&E Organization.

To create a culture in the organizations where injuries are a thing of the past, remind everyone that complacency is a dangerous thing; it is a beginning of the worst performance for any Organization. This will create an environment where everyone at every level in the organization will increase their commitment and their involvement in making the workplace injury-free. The result is that everyone can go home every day to their families without injury.

As we all know that the technology is growing, automation is being put in place in every operation, we are trying minimize the human intervention in every aspect but.... but... incidents keep happening..... why.....why.... the reason we, found from all major incidents is the behavior of the workforce and complacency issues. And this is the biggest challenge for SH&E Profession in the 21st Century. We need to address this by continuous and consistent efforts by SH&E professionals.

I take this opportunity to thank ASSE for inviting Essay contest on “What is the greatest Challenge facing the SH&E Profession in the 21st century”.

- By Ashok Garlapati
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ASSE challenge to protect future health

The tragic 1911 Triangle Shirtwaist Factory Fire, where 146 mostly female garment workers lost their lives, helped foster the beginning of the American Society of Safety Engineers. As ASSE enters its second hundred years helping to protect life, the society faces its greatest challenge, not only to continue to unlock doors for safety but specifically to unlock minds to perhaps the greatest opportunity ever to improve human health. This opportunity begins with a simple question: How should SH&E pros, employers, and society treat female workers today? When minds are opened to this question, a new and exciting world emerges with possibilities never imagined 100 years ago – or for that matter even imagined within the past decade.

We begin this journey of discovery not within the walls of ASSE's celebratory and learning events at its 100th anniversary meeting in the Windy City but in the neighborhoods around the greater Chicago area and Cook County Illinois. Pregnant women in these areas have and are being recruited to participate in the National Children's Study (NCS). At an estimated \$6 billion dollars and more than 10 years in development the NCS is the largest and most ambitious study of its kind ever attempted in the U.S. Along with the greater Chicago area, the NCS will include 105 study locations across America. The NCS will eventually enroll more than 100,000 pregnant women to assess how environmental factors affect child health and development. Initial findings from the NCS will roll out in 2012.

Alone the NCS is a marvel but its power is multiplied by an unprecedented global collaboration to find and prevent illness and disease among children. Joining the NCS in research development and data sharing are the China Children and Families Cohort Study (300,000 babies), Norwegian Mother and Child Study (108,407 participants), Danish National Birth Cohort (96,841 participants), Japan National Children's Study (60,000 pregnancies), and the Taiwan Birth Cohort Study (24,665 live births). Maternal-child studies planned or ongoing now in Brazil, France, Germany, Israel, Italy, Jamaica, Spain, and the United Kingdom are also looking to collaborate and share information.

Annie Murphy Paul, a science writer, sought to capture the buzz of excitement generated by these and similar studies in her book (published September 2010) *Origins: How the Nine Months Before Birth Shape the Rest of Our Lives*. Paul's research looked into the breakthrough science of developmental origins of health and disease. Paul discovered there's a revolutionary shift in thinking ongoing now among researchers that the nine months of gestation "constitute the most consequential period in our lives." Conditions encountered in utero "have the potential to permanently shape a person's susceptibility to cancer, cardiovascular disease, allergies, asthma, hypertension, diabetes, obesity, and mental illness – even conditions associated with old age like arthritis, osteoporosis and cognitive decline."

Miami Declaration

The NCS and similar groundbreaking studies are the result of the 1997 Miami Declaration on Children's Environmental Health where rich countries (G8 and Europe) agreed to place a high priority on identifying and assessing health risks to children. The U.S.'s initial contribution was Federal Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. EO 13045 mandated that all federal agencies address the concern of children's health. Based on this order, the U.S. EPA launched more than 100 projects that resulted in over 1,000 peer-reviewed articles in numerous scientific publications. Europe went much further with its commitment to the Miami Declaration when its concern for children's health sparked the creation of EU's massive new chemical management law known as REACH.

Children's health

A focus on children's health is disparately sought to counter a worrisome rise in childhood illness and disease across the globe. Trends with U.S. children's health as they age are particularly disturbing. Autism spectrum disorders, for example, have jumped 10-fold in the last decade. Recent studies suggest that these disorders may now effect 1 in every 110 U.S. children. According to the National Cancer Institute, from 1975-2005, the cancer rate among 0-14 year old U.S. children has seen a 55% increase in leukemia, 51% increase in testicular cancer, and a 39% increase in primary brain cancer. A study released in the February 2010 issue of the Journal of the American Medical Association finds that the rate of chronic disease such as asthma, cystic fibrosis, diabetes, obesity, developmental disabilities, cerebral palsy and consequences of prematurity and low birth weight among U.S. children has doubled in the last two decades. If trends continue U.S. children born in the near future may be the first generation to be less healthy than their parents.

Prevention

The most effective way to prevent disease is to address its potential at the earliest life-stage of exposure. Prevention should begin preconception and be emphasized during the time a woman is pregnant. This advice was offered by the U.S. Centers for Disease Control and Prevention in 2006. Born healthy, stay healthy – that's how chronic disease among U.S. children can be beat. Prevention means we must act upon known, suspected and emerging hazards.

Consider the health consequences of low birth weight children. Children born with a low birth weight are prone to mortality in their first year of life and they are more likely to experience chronic health problems such as asthma, high blood pressure and poor cognitive development as they age. Can a woman's work during pregnancy be a factor for having a low birth weight child? If yes, would prevention be effective?

The research article *Work Activity in Pregnancy, Preventive Measures, and the Risk of Delivering a Small-for-Gestational-Age Infant* appeared in the May 2006 issue of the American Journal of Public Health. The research found that work conditions of night hours; irregular or shift-work schedule; prolonged standing; lifting loads; noise; and high psychological demand combined with low social support, increased the risk for having a low birth weight infant. Elimination of these conditions before 24 weeks of pregnancy reduced the risks close to those of unexposed women.

Women workforce

Concerns for children's health are compounded by trends in the women workforce. In 1970 only about 3 in every 10 women in the U.S. held jobs outside the home. Women have now balanced the scales with men in the U.S. workforce; and, seasonally the scales may tip in women's favor. Women hold jobs in all occupations, even those once believed to be the exclusive domain of men. Today 3 in every 10 jobs in manufacturing is held by a woman, 10% of construction workers are women, and one in 25 firefighters is a woman. As America shifts from a manufacturing economy to a knowledge and service economy, future growth jobs favor women workers over men. According to employment projections by the U.S. Bureau of Labor Statistics, women will dominate 13 of the 15 fastest growing jobs during the next decade.

Cycle-of-life

But a women's role as a bread-winner cannot stop their important role in the cycle-of-life. Nearly 80% of women who work today will become pregnant sometime during their working lifetime. Births in the U.S. reached an all-time high (4.3 million) in 2007 – topping the peak year during the Baby Boom Generation. More than one-half of these children were born to a mom who worked during her pregnancy. These statistics, however, tell just part of modern demographics of U.S. women who have paid employment while pregnant. Compared to their counter-parts in the mid-1960s, the pregnant U.S. worker today will be older, more educated, less likely to be married, and they will work longer into their pregnancy before giving birth and will return to work much quicker after giving birth.

Parental occupational exposures

Across the globe children's health is now viewed in life-stages from conception to adolescence. The concern that children's health may be impacted by parental occupational exposures before conception and maternal occupational exposures during gestation or breastfeeding has drawn a global focus on this issue. This is one reason why the NCS and other global collaborative studies on children's health all include the parent's occupation as a component of exposure that may affect child health.

Risk assessments

Recommendations for organizations to consider risks to pregnant workers have been established as far back as 1919 by the International Labour Organization's first Maternity Protection Convention. The European Commission established the Pregnant Workers Directive in 1992. The international standard, OHSAS 18002:2008 Occupational health and safety management systems – Guidelines for the implementation of 18001:2007 explicitly address that organizations consider risks to pregnant workers (see clause 4.3.1.4.4). Most recently, ISO 26000:2010 Guidance on Social Responsibility (published in October 2010) calls for organizations to address the specific and sometimes different ways in which women and men are affected by occupational safety and health risks such as “pregnant workers and workers who have recently given birth or are breastfeeding.” Global actions such as the United Nations Globally Harmonized System for Classification and Labelling of Chemicals, that establishes the highest precautions for chemicals that “may harm fertility or the unborn child,” and the new category “may cause harm to breastfed children,” and its impact at the local level e.g. revised OSHA hazard communication standard, add a priority to the topic.

U.S. position

It seems odd, but the U.S. trails the world on being proactive toward maternity protection, pregnant workers, and children's health. The U.S. has never adopted any of the ILO Maternity Protection Conventions. The U.S. is absent among the approximately 100 countries that have provisions for health protections under ILO's Maternity Protection Database. Papua New Guinea in Asia, Lesotho and Swaziland in Africa, and the U.S. are the only countries in the world without federal legislation for paid maternity leave for all workers. Among all industrialized nations, the U.S. is the only nation to have statutory maternity leave of less than 14 weeks. Every member of the United Nations, except for the U.S. and Somalia, have ratified the UN's Convention on the Rights of the Child. These rights include provisions to protect children from health threats from pollution. Cuba, India, Luxembourg, Turkey and the United States were the only countries to vote against ISO 26000.

Fully informed of risks

Although U.S. employers are not generally bound by global recommendations, and the only hazard regulated in the U.S. to protect pregnant workers and their unborn children is ionizing radiation, the U.S. Supreme Court and lower court actions place a duty on employers to fully inform workers of all risks to reproductive and developmental health. But what does this mean? Given the explosive growth of environmental hazard and risk information during pregnancy the question is likely to be resolved in the courts. A single claim for a prenatal injury,

which falls outside of workers' compensation remedies from workplace exposures, has already reached \$100 million dollars as a negligence suit.

Enter ASSE

What are the determinants of good health? If the nine months of gestation truly "constitute the most consequential period in our lives" then ASSE must heed the call to help. The challenges are enormous. The science is daunting yet compels us to embrace it. Politics are inescapable. Heated emotions are certain. Customer demands may conflict. Complacency may enrage some employees while ignorance or fear of uncertainty may freeze some employers from action. The topic will pull many people from their comfort zone. Most importantly, closed minds may halt or stall innovation. At this juncture, however, inaction is a greater risk than thoughtful action. The juggernaut of global action on this topic forces that ASSE play a hand. Challenges are enormous but so are the rewards.

The first step in this action goes back to the first question asked in this essay: How should SH&E pros, employers, and society treat female workers today? ASSE opened doors to help female workers 100 years ago. Based on ASSE's history the future holds that the society will lead the way in opening minds to better protect pregnant workers and their future children – who will become future workers that look again for the society's help.

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ASSE's 100th Anniversary

Essay Contest

Theme of the Contest

**What Is the Greatest Challenge Facing the SH&E Profession
in the 21st Century?**

By

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Kuwait, 12-03-2011

What Is the Greatest Challenge Facing the SH&E Profession in the 21st Century?

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- 1. Abstract:** This essay is describing the SH&E profession roles & responsibilities in industrial sector, how it influence the Country's development and key challenges which are facing the SH&E Profession in 21st Century. Discussed about GREATEST CHALLENGE that is "Behavioural Change" and explained how it is greatest challenge among the others with the solution.
- 2. Introduction:** Safety, Health and Environmental professionals are one of the key factors in the world sustainability development. They will ensure the safe and healthy operations in the industrial sector and protect the environment. Apart from these activities, SH&E professionals also play a key role in Industrial performance growth, optimising the operational resources and influencing on the products and by-products quality and quantity. If SHE professionals are effective and adequate quantity then industrial sector will influence the Country's economic growth positively, otherwise it may lead to major disasters in industrial sector which will effect on Country's development.
- 3. Key Challenges facing the SH&E Profession in the 21st Century:** As World is developing in dynamic with an excellent technologies in all the sectors, it is one of the key responsibilities of SH&E professionals is to keep the World in a safe condition for present and future generation. During this process Safety, Health and Environmental professionals are facing many challenges; some of the key challenges are given below:
 - ✓ Workforce skills/ Right manpower
 - ✓ Workforce capacity building
 - ✓ Integration of SH&E culture in other departments
 - ✓ Industrial commitment towards SH&E systems implementation
 - ✓ Resources availability
 - ✓ Diversified workforce
 - Communication among the workforce
 - Geographical issues
 - ✓ Behavioural change

Workforce skills/ Right manpower: Right manpower is very important factor for SH&E profession to perform their works effectively and meet the targets within time frame. Since

World is developing in a dynamic way, the requirement of SH&E professionals are in demand. This issue can be resolved by the industry by adopting world class recruitment process and attractive remunerations to employees.

Workforce capacity building: For all Industries, workforce is one of the key resources to meet their objective and targets. If the workforce is not updated with latest technologies which are adopted in the Industry then they may not perform effectively, so this will impact on performance of the Industry. Hence industry should implement the effective Capacity building tools like continuous trainings for SH&E professionals, sending them to seminars, technical meets and encourage with technical programs which will improve workforce skills.

Integration of SH&E culture in other departments: Safety, Health and Environment department is not a standalone. It should integrate with all other departments in the Industry then that Industry performs effectively and it can reach their objectives with less effort. SH&E Profession is facing this problem in most of the industrial sectors. This issue can be addressed by changing the top management behaviour towards integration of SH&E culture and enhancing the awareness on SH&E importance in the Operations.

Industrial commitment towards SH&E systems implementation: SH&E profession is facing a big challenge in getting top management support and also their commitment for SH&E systems implementation. Top management targets the operational growth and shows less importance for SH&E systems. SH&E issues will be directly proportionate with Operations, if Operational capacity is increased then SH&E Capacity also should increase accordingly then only SH&E Professionals can handle the issues very effectively to keep the operations in safe condition. For example Industry will go for best available technologies (BACT) to enhance or improve the Operational capacity to face the World competition but SH&E profession is not getting same support from the management.

This issue can be resolved by changing the management behaviour towards SH&E friendly and with more stringent local or federal regulatory requirements.

Resources availability: Limited resources are also one of key challenges which SH&E profession is facing in 21st Century and they are performing the regular duties with limited resources which will result more stress on them. Because of less resources, SH&E professionals may not perform the regular duties effectively, monitor or control the operations on regular basis and may not take the necessary actions to keep the operations safe and without break down because of SH&E reasons.

By changing the management behaviour and enhancing the awareness on significance of SH&E importance in Industry's development, this challenge can be addressed.

Diversified workforce: This is one of the key challenges that SH&E profession is facing in 21st Century. As World became a Global village, in almost all industrial sectors SH&E professionals are from different parts of the world. This is resulting many challenges for the SH&E professions like communication issues, geographical or regional issues, etc. This can be tackled by the Industry by providing the effective and continuous trainings/ awareness programs.

4. The Greatest Challenge Facing the SH&E Profession in the 21st Century:

Behavioural change: This is the greatest challenge facing the SH&E Profession in the 21st Century because behavioural change is a one of the key factors in the above discussed challenges. Without changing the human behaviour whether it is directly or indirectly, we can't address the above challenges (i.e. Workforce skills/ Right workforce, Workforce capacity building, Integration of SH&E culture in other departments, Industrial commitment towards SH&E systems implementation, Resources availability and Diversified workforce). Whatever systems or facilities industry provides, but without changing the human behaviour to reach the objectives and targets are very difficult.

For example, Industry can get skilled manpower by adopting the World class recruitment process but it can't possible to extract maximum output from manpower unless industry changes the employees behaviour towards SH&E friendly. In case of Workforce Capacity building, Industry can adopt the excellent training systems and all other related tools to build their workforce capacity as required but it is also essential to change their behaviour towards SH&E friendly to get maximum output from them. Similarly to address the other challenges, the behavioural change is essential for the management/ employees towards SH&E friendly.

Since Behavioural change is the greatest challenge facing the SH&E Profession in the 21st Century, it is very important to address this challenge in a systematic or structured way to consider all the human resources industry without fail.

5. Solution for Behavioural change: It is very difficult to define the exact solutions for "how to change human behaviour" and even it is very hard to find out the nature of human behaviour because it will act very dynamic. However in the process of this solution, it follows the following six different stages:

- A. Reach the employees
- B. Identify the employee behaviour

- C. Develop the action plan
- D. Implement the action plan
- E. Monitor the results
- F. Modify the SH&E systems as required

Reach the employees: In this stage, Industry should reach to all the employees by using suitable tools like meetings, interviews, etc.

Identify the employee behaviour: This stage is a critical and important, when organization interacts with all the employees, it should study the employee behaviour very closely and arrange the details in the below given matrix.

S.No	Human behaviour	SH&E details		
		SH&E Systems	SH&E Requirements	SH&E Initiatives
1	Adapt			
2	React			
3	Follows			
4	Resist			

Adapt: Who will implement the SH&E systems/ requirements/ initiatives without any external involvement.

React: Who will implement the SH&E Systems/ requirements/ initiatives with external involvement.

Follow: Who will follow others to implement the SH&E Systems/ requirements/ initiatives.

Resist: Who resist to implement the SH&E Systems/ requirements/ initiatives.

SH&E Systems: In-house SH&E Management Systems

SH&E Requirements: Internal or external SH&E requirements like regulatory requirements

SH&E Initiatives: In-house SH&E Initiatives

Develop the action plan: Upon identifying the employees' behaviour and arranging them into the above matrix, a detailed action plan should develop as per the matrix requirements. For example the Resist category requires a different plan than the React category.

Implement the action plan: Plan should implement within time frame and ensure that all are participated in the implementation part as per their requirement.

Monitor the results: Organisation should monitor the results of the program for some time (i.e. user define) and review the effectiveness of it.

Modify the SH&E systems as required: If the program results are effective and SH&E Systems requires modifications, then SH&E Systems should modify accordingly so it will gives results on continuously.

- 6. Conclusion:** This essay described the “behavioural changes” as a greatest challenge facing the SH&E Profession in the 21st Century along with other key challenges. We tried to give a solution for “Behavioural change” challenge with practical experience. This can be adopted in all types of Organisations.

If YOU care the SH&E System... then It cares YOU...

The 21st century has seen some of the greatest scientific advancements as well as some of the greatest environmental disasters in history. When these two factors combine - devastating results can and have ensued. Although the natural disasters were not created by man the results that followed shows mans inability to understand the superiority of Mother Nature and her results. What happens when an outside force affects our current technology? What is the Greatest Challenge facing the safety and health industry today? It is mans inability to understand that he cannot fully manipulate science and he definitely cannot control nature and her consequences.

In the last 10 years the world has seen a devastating number of earthquakes, tsunamis and hurricanes. These naturally occurring events may not have increased in frequency or be presenting themselves more than previous times, but because of the condition of the modern world it produces a different set of results. Today's world is more heavily populated as well as more densely. Population, in turn contributes to more buildings, structures and technological advances that may be engineered and designed for natural events. These events can cause serious damage in the midst of them. In the last year alone we have had at least five earthquakes that have killed a combined total of over 232, 000 people. The most current event in Japan (an earthquake and tsunami) highlights a number of lessons from which the safety community can learn.

Every safety person should know that every business plan should include a safety plan. Better yet, every good business plan involves a good safety plan. Every business plan should include not just a safety plan but a realistic plan that realistically weighs the option of people's

health against any other concern under heaven. In the case of nuclear reactors-it seems to be an all or nothing event. It may be possible for small situations to present themselves at a nuclear plant and be quickly remedied. But what happens with the larger ones? The current happening portrays a different picture in the damage control of a large nuclear disaster. Even if the workers can keep the reactors cooled-the radiation has already been released and done its initial damage. We have yet to see the full scope of the damage caused by the radiation event. It will be years before health specialist can pinpoint all of the concrete, secondary and possible related effects of this turmoil. At least three of the cores have contributed to the hydrogen explosions and radiation leaks which have in turn caused increase radiation in the food and water as well as in the air. One hundred milliseiverts has been shown to cause an increase in cancer. At one point, Japan reported the radiation levels at 400 mSv per hour. It has also been reported that large doses of radiation and/ or acute radiation exposure can destroy the central nervous system, red and white blood cells, which compromises the immune system, leaving the victim unable to fight off infections. Where was the safety plan? Could there really be one? There can not really be an "after radiation is released" plan. Once it is out there-it is out there to be dealt with.

Political and financial factors should not be the motivation factor for any decision- especially one that affects people and the enviroment. When placed on the scale against people's health it seems as those the political and financial factors usually prevail. The evidence and data has been collected to show that nuclear power is more economical than electric power. One of the benefits is reduced carbon emissions which in turn results in less fees toward carbon taxes and fees. But as we are witnessing, this is a small price to pay in relation to

someone's life. Any quality safety person will inform you that wise planning in the early stages will result in less financial burden in the long run. Returning to the prior safety plan, who was present to mention the cons and costs of a nuclear reactor gone wrong?

This natural disaster and consequence of the nuclear reactor is a grand lesson for us to learn as current and future members of the safety profession. The disaster in Chernobyl in 1986 was a perfect example for which to model any future nuclear plants. Humans should not, but often practice the "that will not happen to me" philosophy. Even though the initial destruction was not caused by the same or even similar causes-the results will be quite the same. Current news reports have many present and former nuclear power plant employees across the world coming forward to share their stories of bosses who were not concerned with the hazards, risks and concerns that were shared with them. More citizens are now more educated and in turn more concerned with nuclear reactors close to their neighborhoods. This has been quite a wake-up call for the world. The desire should be for everyone, not just safety professionals, to exhibit and exercise cautiousness where their safety is concerned. As great as nuclear power may be in the forefront, the results of this nuclear disaster will be devastating for years to come. Past nuclear disasters have cited health concerns such as mutations in both people and animals, chromosome abnormalities such as Down's syndrome and Neural Tube defects. Areas in relations to the disasters have experienced a death and/or severe reduction in the earth's natural resources, trees and the wildlife. The worst result is that of the workers and volunteers that donated their time and even worse their lives to attempt to offset the nuclear disasters. There is almost a 100% probability of death and cancer for someone who assists with the damage control associated with nuclear disasters. As far as the financial aspect is concerned,

the money that was initially saved when comparing nuclear vs. electric power generation, will now be spent in lawsuits and medical concerns for Japan's people. The displacement and distrust of their people will be a far greater price than they ever thought they would have to pay.

Carrie L. Thomas

Essay Contest: What is the greatest challenge facing the SH&E profession in the 21st century?

“No one told me I shouldn’t do that.”

It must be the most frustrating thing for any safety director to hear. After methodically training employees or contractors on safety policies and procedures, one of them gets hurt or commits a safety violation. During the ensuing investigation, the worker says, “No one told me I shouldn’t do that.”

The information age is growing at an amazing rate, yet why haven’t we seen a correlation of increased worker understanding? I believe the answer is quite simple: Our workers are actually suffering from information overload. The internet offers a seemingly endless stream of safety information. Anyone with an internet connection can peruse all the OSHA regulations, manufacturer recommendations, and the countless blogs from so-called “experts”. In addition, it seems like each industry adds internal policies and procedures that must be heeded, “as a condition of employment”.

The lack of safety training retention is quite easy to measure. You already have documentation showing that your employees are trained on key safety information. You have copies of the quiz sheets that they passed (can anyone really fail them?). However, when you walk into your workplace, do their actions and behaviors demonstrate an active comprehension of your safety programs?

Old School: The “safety cop”

The old method of enforcing a facility’s safety program was to send in the “safety cop”. The traditional safety director was told to, “Talk the talk, Walk the talk, and Stalk the talk.” Safety inspections carried the certainty of “findings”, and there would be disciplinary actions to follow them. We might argue about how effective this approach may have been in the past, but it really isn’t succeeding with today’s workers. Whenever the safety director becomes the safety cop, the resulting culture of fear, shame, and frustration will only widen the gap between the safety program and the worker’s “real world” actions.

The solution: The “Safety Coach” approach

The best solution to close the gap between information and implementation in today’s workforce is to bring in the “safety coach.” The safety coaching concept replaces the safety cop with a humble individual who invests time and energy to ensure the workers have the necessary tools to take charge of their own safety. The coach understands all the complex safety regulations. However, they have the uncanny ability to transform complex regulations into simple actions or behaviors workers can understand. Caring communication is the cornerstone of the safety coach approach.

Essay Contest: What is the greatest challenge facing the SH&E profession in the 21st century?

The safety coach starts with the belief that everyone wants to work safely, but recognizes that everyone has a different understand on how to reach this shared goal. The coach comes alongside the workers to ensure they have the right information and guidance to make good safety choices.

The safety coach edits the refresher training programs to ensure the information is pertinent to the workplace. Their focus is on the specific actions or behaviors workers need to master in their specific work environment. The coach also measures the training retention by asking the workers to demonstrate their proficiency. Then, the coach follows up with the workers to ensure they are still able to demonstrate proficiency a few days later, a few weeks later, and a few months later.

The safety coach holds their workers to a high standard of safety excellence. They are never afraid to speak up when they see a safety violation, but their approach is quite different from the safety cop. Whenever the coach identifies an area for improvement, they start by asking the worker questions. The answers to these questions will allow the coach to understand the worker's decision making process. Once the worker's understanding has been assessed, the coach can give them appropriate guidance to ensure their actions or behaviors are corrected.

The safety coach isn't afraid to use disciplinary procedures if it's warranted. However, all the discipline is based out of care and concern for the worker's greater good – not from a desire to punish the offending worker.

The safety coach is always looking for value in each worker. Their care and concern leads them to find unique ways to get employee buy-in on the facility's safety program. The coach caters to sequential learners who need everything explained in simple steps, but they can also provide the "big picture" for those workers who prefer that learning style. The coach keeps trying, and doesn't give up on workers who are confused or overwhelmed.

The safety coach earns the respect of their employees by seeking out safety solutions. Unlike the safety cop, the coach also cares about production and quality. Rather than finding ways to halt production, the coach helps workers find safe ways to increase production and quality. They listen to the challenges of the dynamic work environment, and encourage the workers to be proactive in planning safety into any new projects.

The safety coach ensures all the workers know the "safety score". They let everyone know when the team is succeeding, and explain what areas are hampering the team's success. The coach is also the worker's biggest cheerleader when the safety program is showing signs of success!

Essay Contest: What is the greatest challenge facing the SH&E profession in the 21st century?

Can a safety cop become the safety coach?

The beauty of the safety coach approach is the focus on caring communication. Today's safety cop can become tomorrow's safety coach if they are willing to make a few changes. It takes an intentional shift of focus. Rather than focusing on the safety violations in the workplace, our aspiring safety coach must ask, "Why has this violation occurred?"

Each safety incident should be investigated by the coach to identify what underlying cause (or causes) has allowed this incident to occur. The workers involved must know the aspiring safety coach isn't interested in placing blame. This subtle change in focus allows the workers to be part of the safety coach's team. They are able to help the coach identify the real problems, and they are able to suggest corrective actions.

Aspiring safety coaches also need to seek accountability from their "assistant coaches" – the facility's management team. By exchanging honest feedback with the management team, the aspiring safety coach can refine their style to best meet the needs of the workplace.

Finally, the aspiring safety coach should seek out further professional learning opportunities. Good coaches are always willing to learn from others. Their continuing education should focus on workplace safety, communication, and enhanced teaching techniques.

What is the measure of success?

Every safety coach must have a clear goal for their safety program: 100% personal accountability. When every worker takes charge of their personal safety, the safety coach knows they have a winning team in place. When the workers are able to demonstrate consistent proficiency in the safe work practices, the safety coach knows there the gap between information and implementation has been successfully closed.

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What Happened to Accountability?

About a month ago, I read the tragic story about an 8-year-old boy who was killed as he was firing a .9mm Micro Uzi submachine gun at a gun show in Massachusetts. This particular weapon fires 20 rounds per second and has a powerful recoil, one with which grown men are known to struggle. The young boy lost control of the gun and shot himself in the head as he was being videotaped by his father. Although this accident happened in 2008, it's back in the news because the man who organized the show and the men who provided the guns are now on trial for involuntary manslaughter. The boy's father, a physician who has practiced for over thirty years, signed a waiver at the gun show stating he would not hold anyone associated with the event liable in case of an accident. However, he decided to sue and won an out-of-court settlement from the sportsman's club who sponsored the event for \$700,000. He also decided that specific individuals were to blame and sued the people who conducted the show and supplied the guns, despite the fact that he was the one who insisted his son be allowed to fire the weapon after being told twice from a gun show employee that it was too powerful a gun for the boy to handle. Who's really responsible? And how should he/she/they be held accountable?

A horrific accident, a needless death, a familiar story. This particular accident is not unlike the ones we investigate year after year with the hope of preventing another injury, the ultimate goal being an injury-free workplace. But that goal will never be reached without an effective, written accountability system in place. Helping business leaders establish an effective accountability system as part of their safety process is and will continue to be the greatest challenge facing the SH&E profession in the 21st century.

By now, most employers have written safety programs and know they have to abide by OSHA regulations. Training is conducted and documented, forms completed and posted, and safety meetings held. Every year it seems more CEO's are "getting it," so why are employees still getting hurt and killed? I believe it's because of an absence or failure of the accountability system.

For non-safety professionals, responsibility, authority and accountability may be words that mean the same thing. However, for those of us who were trained on their applicability in the work environment, we know they are not. The concept is simple: It takes someone of authority to assign responsibility for getting the work done and then hold people accountable for doing it. The difficulty seems to be establishing and maintaining an accountability system. When workers are still being injured and killed by moving equipment that wasn't locked out, guards that weren't replaced or training that wasn't done, there isn't an effective accountability system. When injuries still go unreported, confined spaces entered without adhering to procedures, or chemicals handled without the required PPE, there isn't an effective accountability system. Safety audits may be completed according to schedule and documented per protocol, but if there isn't a system in place to ensure that whoever was responsible for fixing the ladder, testing the

atmosphere, or revising the procedure actually did it, then someone is eventually going to get hurt.

Admittedly, holding people accountable for their actions is not a pleasant or easy thing to do, especially when those actions (or absence of them) caused someone to get hurt or killed. Those of us who have had to question the employee who was responsible for flipping the switch to the machine that crushed his co-worker to death know that punishing this employee in some way for not following lockout/tagout procedures is not the outcome we want to advocate. But what other course of action is available? What can be done to hold the employee accountable that won't be perceived as punishment and that won't negatively affect morale?

There are no magic answers. As safety professionals, we know that an accountability system must include assigning a specific name to a specific task with a completion date. We know that the process must be documented and communicated, and we know that there must be follow-through. Someone must be assigned to ensure the task was completed by the due date and to report it to management, who then formally signs off. Unfortunately, a comprehensive system like this is difficult to establish and even more difficult to operate consistently because of the negative consequences attached to it. To date, I haven't met any manager or supervisor who enjoyed enforcing a negative action for an employee who caused an accident that seriously injured himself or a co-worker, regardless of causation. Few managers and supervisors that I know have actually done so.

The purpose of this essay is not to promote a disciplinary system for employees who knowingly or unknowingly violate safety procedures, whether management or labor.

The purpose is to advocate a written, comprehensive accountability system that is developed proactively with input from all employee levels, enforced consistently and reviewed on a regular basis to ensure effectiveness. Adding the procedure as an element to the safety audit process would provide this assurance.

As we celebrate ASSE's 100th anniversary and continue into the 21st century, let's not forget the basic tools that have brought us to this point. We can use the latest technology and implement novel approaches, but there is no substitute for what has irrevocably worked in the past, and that includes an effective accountability system as part of a comprehensive, proactive safety process.

Protecting Workers from Falls: Our Greatest Challenge

I believe the greatest challenge facing the Safety, Health & Environmental profession in the 21st century is protecting workers from falling. Whether it be off a ladder, staging, rooftop, steel beam, leading edge, or from one level to another or through a floor opening, protecting workers from falling is essential to providing safe and healthful workplaces for employees. Although there are many regulatory standards to cite, best practices to follow, quality equipment to use and a lot of fall protection training being done, workers continue to ignore, disregard or discount the risk and expose themselves to falling.

Obviously, falls may or may not be fatal. According to the Bureau of Labor Statistics, falls accounted for 617 of the 4,340 or 15.4% of all fatal occupational injuries and 265,680 of the 1,238,490 or 21.5% of all nonfatal occupational injuries and illnesses involving days away from work in 2009. These statistics are alarming given the time, effort and resources currently being spent on fall prevention and protection.

OSHA recognizes the hazard and has made fall protection their top cited standards for years. However, given OSHA's limited resources and the noninterventionist manner in which a lot of companies and workers interpret the standards leaves room for unnecessary risk and exposure. For example, when considering falls from ladders, the OSHA standards are generally through but do not limit how high a worker can climb on a ladder without being protected from falling. Regarding falls from scaffolding, the OSHA standards are detailed in requiring fall protection when using scaffolding but allow for a "greater hazard or feasibility determination" when deciding whether fall protection is needed when erecting and dismantling it.

When considering falls from roofs, the OSHA Standards allow the roofer to determine whether it is feasible for him\her to be using fall protection equipment. This has created unnecessary exposure to roofers and has unnecessarily confused the other trades working on rooftops that are not allowed to follow this exception. Most recently, many buildings throughout the country have had workers removing snow and ice from their roofs. This has increased the number of workers exposing themselves to a fall from the roof, as they push snow to the edge of the roof where obviously the greatest risk is present. Very few of workers shown on national television are protected from falling.

Regarding steel erectors, the OSHA Standards allow them to go as high as 30 feet without being protected from falling. Generally when considering falls from one level to another, OSHA has detailed standards regarding stairwells, guardrails and floor openings but given the numerous scenarios and environmental conditions associated with falls of this nature, not all conditions can be addressed and regulated. Therefore, the OSHA Standards can be limited when it comes to protecting workers from falls.

Thankfully, these limitations of the OSHA Standards have been recognized by many companies and they have implemented safety programs that do not allow their workers to take these unnecessary risks. They have integrated best practices into their safety programs. For example, some companies have implemented the "6 foot fall rule". This means that any worker who is exposed to falls equal to or greater than six (6) feet must utilize fall prevention and protection systems. This imposes additional requirements that, like the rule implies, limits the height, at which a worker without fall protection, can climb a ladder, erect or dismantle scaffolding, work near a roof or unprotected edge, or work off of steel, to 6 feet.

I once had a safety instructor say "just write the 6 foot fall rule into your program". I thought "wow" that's easy. However, I knew there is a lot more to it than that and clearly there is. These programs lead to writing this requirement into your contracts if you're an owner or controlling contractor and enforcing them during the work. If you are not an owner or controlling contractor, it requires providing fall protection plans, equipment and training. These requirements can get very resource intensive, and the associated oversight, fall protection plans equipment and training can get expensive to purchase and maintain.

In support of these requirements there are now a lot of companies selling safety support services, fall protection equipment and fall protection training. I have seen safety service providers who understand the 6 foot fall rule and are successful in making the workers adhere to it. I have seen and purchased high quality, easy to wear and use fall protection. I have sat through good informative hands-on fall protection training.

Given all the positive activities that have occurred, there are many negative actions that continue to challenge those who work to eliminate falls. Although a lot of workers have now had “safety training”, some have allowed complacency to set in. In addition, many workers (from state and local municipalities’ organizations) are not “covered” by the OSHA Standards and do not have fall protection training.

Therefore our challenge in minimizing and/or eliminating these falls needs to be a four “pronged” approach. First, we must as a safety profession, require more than the OSHA Standards, which are obviously “the minimum standard”, through program development, contractual requirements, and accountability. Second, we must plan for, recognize and physically eliminate the fall hazards and/or provide quality fall protection equipment. Third, we must further train and educate all workers. Last, we must determine the workers and/or companies that recognize and then fail to protect themselves from fall exposures and hold them accountable through disciplinary means. In addition, while performing all these activities we must eradicate the long term sentiment that safety costs money.

Our first action, which is to develop programs and contracts which require the performing work as safety as possible, is the easiest. We have control of what we write and implement. Our next action, which is to recognize, eliminate through engineering or administrative controls or through the use of personal protective equipment, is again within our control, for the most part, and therefore obtainable. Next, we need to further train and educate. This action is more difficult than the previously discussed program development and controls. There has been a lot of safety training and education conducted in recent years. We can control the development of the training materials and the training of the trainers but must rely on the workers to attend, understand and implement the training that is being done. Lastly, we need hold workers accountable for their own safety. This all would be made easier if the workers were held accountable through the OSHA Standards and/or legal requirements similar to those in place in Canada, England, etc. However, as of today, the legal system dictates that the safety profession and its supporters implement the difficult task of making workers accountable for exposing themselves to falls by holding their company accountable. This makes the challenge of protecting workers from working safely and falling even more difficult.

The last impediment which is a common thread to all these challenges is money. Most companies see the cost of safety as a reason not to implement the actions described above. In recent years, however, through the efforts of OSHA, the National Safety Council, American Society of Safety Engineers and other safety-related organizations, companies have changed. Most recently the National Safety Council again named the “CEOs Who Get It” for 2011. I hope that one of the quotes from Charles L. Harrington, Chairman and CEO, Parsons Corporation, “Our excellent safety performance...has been a key factor in reducing our insurance cost and in [our customers] selecting Parsons to perform their projects” will resonate with the leaders of other companies and organizations. Thus, defusing the belief that safety costs money once and for all an allow all workers to home safely every day.

The Challenge of Musculoskeletal Disorders on SHE Professionals

Musculoskeletal Disorders (MSD) are among the most common of human afflictions affecting all age groups and frequently cause disability, impairments, and handicaps. Musculoskeletal Disorders are injuries of the muscles, nerves, tendons, joints, cartilage, and spinal disc. MSDs are defined by The Bureau of Labor Statistics to include sprains, strains, tears, back pain, soreness, carpal tunnel, and hernias. Injuries related to an event or exposure leading to bodily reaction (bending, crawling, climbing, reaching, twisting), overexertion or repetitive motion. According to the Bureau of Labor Statistics, MSDs accounted for 28% of all workplace injuries and illnesses requiring days away from work in 2009. The injuries may be caused from trauma or repetitive use. Early ergonomic intervention is the key to preventing permanent disability and heading off the greatest challenge facing the SHE profession in the 21st century.

The 20th century ushered in rapid technological advances that brought computers, cell phones, digital entertainment, and the Internet. The use of technology has also ushered in a less active lifestyle. People sit in front of computers all day and sit in front of their televisions or gaming systems in the evenings. People no longer go to the library and search for a book; they simply download the book to an e-reader. They do the same for music; simply download and play on their mp3 players. Even shopping no longer entails walking the mall for hours, but instead the act of pushing a button from a favorite online shopping site. All this can be done from the privacy of their own personal laptop computer, never moving off the couch. These technological advances are major contributors to the increase in MSDs such as carpal tunnel syndrome and other repetitive stress injuries.

The 20th century also changed the way many people eat. More families eat out than ever before, thanks to the convenience of fast food and drive through. It is rarely seen now days, an employee bringing their lunch instead they opt for the quick and easy take out or fast food. The changes in eating habits contributed to the United States obesity rate and the increase in diabetes. Our society/workforce has become overweight and sedentary. According to the National Institute of Health and the CDC, more than 20 million Americans have diabetes and more than one third of adults (more than 72 million people) are obese. Diabetes and obesity add to the risk of MSDs. The National Institute of Health has found that Type I Diabetes is linked to osteoporosis (low bone density) and increased risk for fractures because of vision problems and nerve damage associated with Type I Diabetes. People with Type II Diabetes have the same increases in addition to a more sedentary lifestyle interfering with their bone health. Living a sedentary lifestyle can also increase the chance of muscle atrophy. Muscle atrophy is the decrease in the mass of the muscle. Muscle atrophy leads to muscle weakness which limits the ability to exert force. Suffers of muscle atrophy becomes unable to perform certain tasks or worsen the risk of accidents while performing those tasks, such as walking. In 2008 the National Health Interview Survey (NHIS) found that 36% of adults were considered inactive. Fifty-nine percent of the adults responded that they never participated in vigorous physical activity lasting more than 10 minutes per week. Sedentary lifestyles can contribute to high blood pressure, high cholesterol, and stress. With our workforce overweight, diabetic with low muscle tone and most likely suffering from high blood pressure and stress, it no longer becomes a question of **IF** they will develop an MSD but a question of when will they develop an MSD.

Most musculoskeletal disorders are preventable with applied ergonomics and a healthy lifestyle. The Industrial Safety and Rehabilitation Institute defines ergonomics as the science of analyzing the interactions of human beings with work stressors related to the process of work, equipment, tools, and the environment. Ergonomics is an interdisciplinary field involving concepts related to biometrics (the mechanics of human function), human factor engineering (engineer redesign based on optimum interaction with human beings), kinesiology (the science of body motion) safety and medicine. The goal of applied ergonomics is to reduce stressors on the human body resulting from job tasks and the work environment to prevent health problems and improve work efficiency and productivity. A healthy lifestyle would be eating a well balanced diet and participating in vigorous exercises for 30 minutes at a minimum of 3 times per week.

Workers come in all shapes and sizes. The shape and size of a worker cannot be standardized; however, we can standardize the procedure for ergonomic intervention to ensure each person is able to perform their job with the optimum interaction of machine, process and their physical shape. Such process as ensuring each employee is medically assessed to accomplish his or her job prior to commencement. Each employee knows how to perform his or her job correctly including the proper body positioning and tools to accomplish each task. Employees are able to recognize the importance of body positioning and the dangers of musculoskeletal disorders. Each employee has a Fit to Work health screening before employment. This should not be a generic health screening, but a screening related to the job description. The employee as well as the employer should be made aware from the Fit to Work screening of any predisposed health risks and how to manage those health risks. Also how those health risks can affect their job performance. Employees should be encouraged to adopt a healthy lifestyle to better their job performance as well as their overall general health.

Fit to Work Health Screenings, Applied Ergonomic intervention strategies and promotion of healthy lifestyles can effectively prevent and reduce the increasing numbers of MSDs. All of these inventions would benefit both the employee and the employer. The employee would avoid injury, pain, and loss of time as well as improved health. The employer would benefit with increased productivity, decrease of loss time injuries and worker's compensation claims. Musculoskeletal Disorders is clearly the greatest challenge facing the SHE profession but preventing musculoskeletal disorders is the responsibility of the SHE profession, and could become the greatest achievement.

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The Greatest Challenge Facing the SH&E Profession in the 21st Century

The greatest challenge facing the SH&E profession is not only how to make safety a part of every single organization in the United States, but how to bring the profession to the entire world. When looking at the prospects of what 100 years can bring to safety, let us quickly look at the past century. The invention of the first aircraft brought the initial techniques into accident investigation. With the techniques of accident investigation, we were able to design better, safer systems to make flight less risky, and develop safety systems such as system back-ups and event reporting. There are also many lessons learned from tragedies of countless disasters and lives lost due to mining operations, construction work, transportation accidents and many more. Additionally, there have been discoveries that work environments can be directly attributed to acute and chronic disabilities, which have resulted in holding the employers responsible for these conditions. Workers can now demand safer work environments and some employers could run the risk of labor strikes if they don't provide a safe work environment. Another triumph for Safety was the government recognizing that Safety is important for the economy, the American people and monetary social systems, by establishing minimum Safety Standards to follow. Finally, the acceptance and embracing of safety by employers to not only accept a minimum safety standard, but to make safety an integral part of the organization, was also a very important turning point in the history of work Safety.

Presently, corporations in the United States recognize that Safety is not only required, but is good for business. Not all of America is fully on board with Safety Standards let alone a Safety Culture. The largest group of workers without a strong Safety program is government employees. Most of the government is not regulated by Safety Standards and is not budgeted for Safety. This is not to say that supervisors and others within the system do not care, but merely in times of economic distress, Safety is not on the top of the list for budget items (of course this does not include public safety officials such as police and fire/rescue). Most local governments do not have Safety professionals on staff and often make Safety an "other duties as assigned" to an unsuspecting employee. Public workers deserve federal protections and the ability to follow established minimum standards as dictated by OSHA. Safety Standards have the opportunity to save the tax payers money if an effective system is adopted.

Another area in which Safety is often left out is small business. Small businesses do not have enough of a profit margin to have a Safety professional on staff or even on retainer. The most widely used resource for small businesses is loss control professionals working for insurance companies advising the small business. Small businesses may unintentionally be breaking Safety Regulations or putting employees at risk. The consequence of a lacking Safety infrastructure may be putting the business one small disaster away from bankruptcy. Currently, the government and Safety Organizations lend assistance to small businesses, but typically the persons seeking out assistance already know they have a problem. The real challenge is reaching the unknowing population of small businesses and helping them gain the knowledge and assistance needed before it is too late.

Safety among the international community is excelling in some countries or regions such as Europe, but not in most. The recent surge in mining accidents has highlighted the failure of governments who lack oversight, and corporations who do not invest adequately in Safety Systems. Many in the world's population are still working in 19th century conditions using early 20th century tools. In war torn regions or countries where the majority of the population lives in poverty, it is accepted that workers are expendable resources. To most workers, personal protective equipment such as gloves and masks are considered luxuries, and the idea of a mandated break is a foreign concept. With the current unrest in countries where dictatorships are being protested against, and democracy is being sought, eventually these populations are going to expect a safe working environment as part of their rights. This concept may not happen within the next few decades, but it most certainly should and could happen within 100 years.

A set back for Safety is when foreign corporations set up manufacturing facilities in poor nations and do not implement the same level of Safety and employee protections that would be expected in their home country. A prime example is the Bhopal, India disaster where there has not been a voluntary acceptance of fault. Foreign development and investment is only mutually profitable when the corporation profits and an economically depressed region has quality work to sustain a good welfare for their people.

As technology and the ability to communicate increase like never before, the human race can no longer be suppressed into thinking that substandard living is acceptable. As the rest of the world's population gains access to established and practice proven safety standards, there will be a shift in the employees mindset that they are deserving of the right to leave work in the same unharmed condition as when they first arrived.

The utopian concept is that one day, man will no longer work for the right to eat and have safe housing for their families, but instead work for the improvement of humanity. This is an idea that we can some day strive for. Until then, we can hope to make Safety Standards fit for all nations using one single voice. The creation of the new Global Harmonized System that OSHA is adopting is a great first step in standardizing Chemical Safety. The adoption of an International Civil Aviation Organization Safety Management System by the United States Federal Aviation Administration is another great first step. The development and adoption of an international based Occupational and Environmental Safety Management System such as the ANSI Z10 standard, is another needed step. Another step may be the formation of a United Nations backed Special Safety Committee that is responsible for providing the developing world's Safety Standards and expectations of Safety. The eventual oversight by an international body to regulate Safety Standards to international companies, who may have otherwise held profits above safety, is another possible future step. These are the ideas that we can work towards in this century and continue to build into the next.

The new generation of safety professionals who will lead us throughout the 21st century are graduating from college now. We have the opportunity to teach them the lessons learned from the 20th century and our hopes and dreams for the 21st century. The new generation has the ability to change quickly with technology and communicate quickly and effectively within a global network. They see that

world peace is not dictated by the action of a single nation, but on the cooperation of many. The challenges are great and many, but all have viable solutions if the spirit of doing what is best for man and the environment is not forgotten. The new safety professional must be strong, knowledgeable and caring. Everyone has the right to work in a safe environment.

Communication is the Greatest Challenge Facing the SH&E Profession in 21st Century

By: Brent R. Brewer

The greatest challenge to the SH&E Profession is communication and the lack thereof. Communication is a key factor for any lasting relationship; co-workers, subordinates, general public. Communication is the complete process of a message that is sent from one person and another person receiving the same message. Communication can be verbal, written, symbols, signs or even signals. We are involved with communication from the minute we wake up with the alarm signaling to start getting ready until the second we fall asleep when our body says we need sleep. Without communication people start assuming. Assumptions are a very bad thing. When we assume, we are actually going all in on “common sense”. But, the last time I checked, common sense isn’t very common. Which that might be good if you’re a gambler, but in the work zone we’re not betting money, we’re betting lives. So, assuming that everybody knows what is going on is a bad bet unless you in fact communicated with everyone. If we didn’t have communication and just assumed we wouldn’t wake up in the morning and fall asleep at night, we would probably sleep all day or become insomniacs. So, we need communication to manage our day to day lives.

The “lack of communication” can mean a lot of different things, and really I am talking about all of them. Things like not informing the field workers of the information put out in coordination meetings in the offices like who, what, when, where and how others are working; not identifying exactly how to get the task done safely; not getting feedback from the employees about SH&E; not putting up barricades when working above; not educating; and of course not being able to speak the language of the employees. Not every new employee is “green” but not every new employee has done the exact same job s/he is going to be tasked to do. The SH&E Professional needs to ensure that every employee understands what his or her job is and how to perform safely and correctly through communicating with the employee.

Having a bad grasp on reality goes hand-in-hand with a lack of communication. Depending on what kind of employee is at hand will determine how that individual views reality on the jobsite. There are three groups of employees; there is the brand new “green” employee, the employees that have been doing this for a few years, and the “seasoned” employees. The “green” employee is nervous and doesn’t want to mess up on his new job, that’s why he takes in every bit of information to do the job well. The bad part about that is that employee is mixed in with “seasoned” employees that do it their way and have never been hurt before. The new employee has been educated on how to perform the job both by text book and how it’s done in the “real world”. The seasoned employee has never been hurt, but also accepts risks because work “is dangerous” and this is how they’ve been doing it for years. These employees are the ones that

throw guards away, don't keep fire extinguishers around hot work, can not wear gloves because they need to feel their work, forget the dust mask when cutting cement, and lets not forget doesn't need fall protection. Sure, it's true that some of the "green" employees might get frightened by risky acts, but most in that group are invincible. They are young and cannot be killed or badly injured.

With proper communication between supervisors and employees such as training/education and explanation of how and why the job needs to be performed a certain way, employees can not only be safe while working, but they can be more efficient. A properly completed/communicated daily Job Safety Analysis (JSA) can promote pre-job preparedness, hazard awareness, responsibility and communication. A proper JSA can prevent injuries, confusion, and unforeseen hiccups in the process of a task. The procedure of conducting/completing a JSA is where the real magic happens. Within the steps of a JSA employees and foreman communicate about the job steps, hazards involved with the steps and the environment around them such as what other trades are doing, and how they will avoid/eliminate the hazards/risks. With everyone's involvement of giving their thoughts, questions regarding the whole job process get discussed and then everyone is in tune with what is supposed to go on. There is a mind set in every living being that insists on continuing whatever it's doing until told otherwise, which means that people are used to being warned. If employers don't warn employees of hazards they will assume everything is okay and wont thing twice about the situation. Think about it. When an employee does something the wrong way but everything goes good, that employee will continue doing the same thing the same way until it is picked out and addressed.

On a construction site, the field and office are really on two different projects. Anything SH&E related that gets communicated in an office meeting is never communicated to the field and vice versa. It all sounds good in the meeting and looks great on the meeting minutes but there is a barrier between the two locations. Now, I'm not sure if it is that SH&E is not taken seriously, or it's considered time consuming, but what is being noticed is that employees (even the ones getting paid by the hour) are rushing around to get the job done and keeping safety on the "back burner". That is a situation that is just mind boggling; employees are deciding to rush around and risk their lives rather than get paid longer and be safe while getting the job done. This is why communication needs to start from the very top of companies and enforced the whole way through to the bottom end laborer that the safety of each and every employee and the environment is by far the number one priority in every job every day. If the communication starts from the CEO/President, it will cover safety and production which inevitably blankets both sides of the corporate spectrum.

In conclusion, with proper and adequate communication, ALL problems can be resolved.

"Plan your Work, and Work your Plan."

Communicate – and Save Lives!

N. Krishnamurthy, Ph.D., ASSE, Safety Consultant, Singapore

Heart to Muscle

Lack of proper communication is the greatest challenge facing the safety, health and environment (SH&E) profession in the 21st century.

Not the technology – there is more than we can handle, more than we can use, most of the time.

Not the awareness – we understand the need to protect ourselves from accidents and ill-health due to adverse work conditions, even the imperative to protect the environment for our own sake, for our children's sake.

Not the resources – accepting the need to invest in warding off danger rather than to take care of its ravages on individuals and society, we are willing to spend on safety.

Not the manpower, not the skills – we have all these in plenty.

What we are short of is how to link all these with people, and how to link the people together – how to communicate.

With the best of intentions in our quest for increased safety, we may have been blinded by the technicalities, the logistics, and the legal niceties and not-so-niceties, to the extent we might have forgotten that what will make all these work is the sharing of safety information.

So now, how does heart translate to muscle in real life?

Through communication, good communication, simple communication, honest communication, constant and complete communication.

That is how.

Beat the Belt

In the 1970s when the seat belts began to be used in the U.S. there was a lot of resistance, with the attitude: *"It is my life, why should you care?"*

Auto manufacturers tried to help by making cars which would not start unless the seat belt was buckled – but many defeated it (read 'cheated') it by buckling clasps behind their backs.

It took a few years and some innovative measures like showing pictures of multi-car crashes and mangled bodies of entire families in the driving theory test booth and to every traffic violator, before the driving public accepted the fact that it is more than the driver's life that was at stake in wearing seat belts.

The problem persists in many less developed countries.

What worked – what will work? Communication.

Lawless Helmet

On a similar risk, in many countries two-wheeler drivers and/or their pillion riders do not always wear helmets.

In India, for decades now, helmets are a state subject, often reduced to political football, with each fresh government imposing or removing the helmet rule. Reasons are exotic, as women complaining helmets ruined their coiffeures and men claiming slow speeds didn't rate them.

What is the problem? Ignorance!

Solution? Explain to and convince the people who will be injured and will die, the dangers of riding without helmets. Print leaflets and posters stating stark facts about how many die just because they do not wear helmets. Send women volunteers to homes and meetings to explain to women how they should preserve their lives for their families rather than preserve their hair-do-s for admirers. Similar persuasive messages could work for men too.

What is the hope? Communication.

Spanish Lesson

In the 1980s the influx of immigrants from Mexico into U.S.'s Southern states increased to a flood responding to the increased need (or want) for cheaper construction and factory labour – and almost immediately the accident and fatality rates in these industries went up, and was mostly attributed to the immigrants.

Fingers were pointed at the inefficiency and cultural differences of the immigrants.

However, deeper investigation revealed that the fault was not in the immigrant worker's skills, which were often of a higher order than the natives', but in the simple fact that the newcomers did not understand the instructions, let alone the safety culture prevailing in the U.S.

The situation was soon set right by translating all printed instructions, safety posters etc. into Spanish, and using Spanish interpreters to get the points across. The accident rates dropped rapidly.

Two further steps were taken:

- One, the Chicanos were briefed on the background to the stiffer rules, the dangers they faced, the consequences of the danger (*"Would you rather return home on your own two feet, or on a stretcher, or worse, a coffin?"*), and safeguards being taken to protect them.
- Two, supervisors in the Southern states with the maximum immigration rates were asked to pass a Spanish test. The accident rates soon improved to better than the local average!

I have seen similar problems surface and similar solutions work, halfway round the world in Singapore.

What helped? Communication.

Eloquent Silence

Accepting that safety must be practised and implemented by top management, many well-meaning companies spend a lot on safety. Yet they continue to have accidents. Why?

Often because their message is in high-faluting language – it has just not reached the workers.

Even when the management writes on safety for supervisors and workers, the language is at the manager level: 'Catastrophic mishaps' and 'Hierarchy' are simply noise to the field staff,

even in English-speaking countries. 'Very dangerous accidents' and 'order of effectiveness' would serve better.

We should be really be writing for the worker who faces the danger and for the foreman who has to manage it. Simple language and colourful visuals will get the message home faster than eloquent pleas.

In other words, communication.

Report Up!

It is the worker who is in the line of fire. He (or she) knows what is hazardous in his workplace. He sees first when something is not quite right , where something can go wrong.

Does he report it to superiors so the problem can be rectified before somebody gets killed?

Nah ... With the exception of a few enlightened countries and disciplined industries, the typical worker tries to escape from this chore, to get around it, or to put up with it, rather than report it to the bosses.

Why? Because one, he does not understand or appreciate what may happen if he does not report it, and then an accident happens because he did not report it. And two, even if he wants to, he just does not have the language to communicate them formally.

He needs help to report close calls and minor problems that need fixing before they become a threat. He needs a simple way to pass on the information without having to sit down and write an essay on it.

Meaning, communication.

Safeguards can Kill

Everybody knows that body harnesses which grasp a worker's weight at the heavy-boned shoulders and hips rather than at the waist are the right personal protection equipment to hold up a fallen worker before he hits the ground.

But often, neither the worker nor the supervisor know, or remember, that hanging for oo long from a body harness can kill; that other factors like proper adjustment of the many straps on the harness, a strong anchor, the minimum falling distance, and a rescue system in case someone falls – are all as important as if not more so than the harness itself.

Everybody using the harness must be trained in the support and back-up systems for harnesses, must learn how to share the information, how to remind each other about it.

That is to say, communication.

Babel Now?

Let us look at some nitty gritty.

In safety, we literally don't talk the same language around the world. Much gets lost in translation. Intentions are honourable when a developing country borrows proven successful language for its own use. But the outcome may be funny if it is not so sad.

Risk assessments are truly a Babel of tongues. If God really threw in different languages to keep humans for ever apart, He has succeeded in safety.

I have inspected factories in Singapore. Most Singapore signs are in the four official languages: English, Chinese-Mandarin, Malay-Bahasa, and Indian-Tamil. Let us note that Bahasa uses Roman script.

The first and third, in the fire safety sign at one factory read: "*Flammable –Inflammable*".

How is that for a common terminology?

A little explanation is in order. "Inflammable" was the original word to indicate things that can catch fire easily. But many non-English speaking nations (and America!) dropped the prefix "In" as meaning "opposite of", so "inflammable" meant "fireproof"¹.

Whence the confusion? Communication.

One Word, Many Uses

It can get worse.

Some years ago, a research project by Hillson² into the terms used in the risk management area by 507 companies came up with the following statistical "facts":

- The same word was used to denote quite different safety states, sometimes the exact opposites.
- The same risk was denoted by many different words, and (hence) classified into widely varying intensity risk levels.
- The overlap between five different terms to describe likely hazards was about 15%.

My own less ambitious personal research into published risk assessments brought out the following anomalies in intermediate level descriptions, to cite a few:

- Likelihood: (1) Infrequent, frequent; (2) unlikely, very likely, very unlikely.
- Severity: (1) Acceptable, extremely serious; (2) major, minor.
- Risk: (1) High, low, low-medium, medium; (2) tolerable, undesirable

While some of the differences might be attributed to the authors' assessment of different industries, the fact remains that words do not have fixed meanings in the risk arena.

What is wrong? Communication.

Uncommon Measure

Another bar to safety communication is the lack of common metrics (measures) for risks.

I have been exposed to safety practices and violations in different industries in many countries around the world. The successes and the failures are surprisingly, or reassuringly, the same, as if echoing the fact that all blood is red, and that all families mourn the dead with equal sorrow.

Shockingly however, no two of the dangers sound similar when the risks are assessed. Even

¹ *The Write Way*, 10 Jan 2003, <http://www.write101.com/W.Tips215.htm>

² Hillson, David A., *Describing probability: The limitations of natural language*, <http://www.risk-doctor.com/pdf-files/emeamay05.pdf>

when they are evaluated numerically, the numbers for two identical mishaps in two different industries in the same country, or in the same industry in two different countries, are nowhere near each other.

An American and a Japanese know what a Richter 6.8 earthquake is. Fujita Tornado Scale, Saffir–Simpson Hurricane Scale, and Bierl-Hicks Faces Pain Scale specify the intensity of tornados, hurricanes, and pain in the same simple metrics.

But, with the possible exception of the aviation sector, there is no such global measure for the level of danger or harm. If I say that a job I do has a risk index of 3, it may not mean anything – or worse yet, it may mean quite different – to anybody outside the particular organisation I work for, or to the organisations in the same geographical region doing almost exactly the same job.

How then can we compare the dangers across departments and industries, across nations? How can we learn from each other's mistakes? How can we share our risk assessments and our controls for the higher risks, without a common measure and a single voice in this vital area of human behaviour and suffering?

This was why I presented a universal, common scales to assess the likelihood and severity of mishaps and losses, at a regional conference³. Expanding on it at an international meet in U.S. in December 2009, I closed my presentation (over-) dramatically extending both arms wide and asking experts in various disciplines from the audience to come together and form a committee to develop a universal 'Deca-Scale' for risk assessment.

Nobody did.

But Nobel Laureate Professor Kenneth Arrow (who just happened to sit in on my lecture) wrote to say that my presentation was "coherent and convincing"⁴.

I hope some day safety assessment will be formalised into a common universal mode, and shared in a common universal tongue.

Yes, yes, communication.

Go Communicate

Let us communicate simply, directly, in terms understood worldwide, to retain their intended meaning when translated.

Let us talk with and write for all the endangered.

Then all will begin to see a reduction in workplace accidents around the world, not just the ones that talk big (words).

³ Krishnamurthy, N., *From Qualitative to Quantitative Assessment in Risk Management*, Proceedings of International System Safety Regional Conference, held in Singapore, April 2008.

<http://www.profkrishna.com/ProfK-Assets/ISSRC2008-QualiAbst&Paper.pdf>.

⁴ <http://www.profkrishna.com/ProfK-Assets/SRA-Dec09-Report.htm>