

SPECIAL ISSUE
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on Safety

WORLD FOCUS



AMERICAN SOCIETY OF SAFETY ENGINEERS

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Improving Occupational Safety & Health through Education in Nigeria

Editor's Note: With more than 25 years of experience as an SH&E engineer in the production, manufacturing and oil and gas industries, Umoumoh has made lasting contributions to SH&E practices in Nigeria. In this interview, he explains his company's efforts to promote and improve occupational safety and health in Nigeria, and he offers suggestions for incorporating safety training into the country's educational curriculum.

IPS: Provide a brief overview of Pro-Lines International Co. and of your responsibilities as chair and CEO.

UU: Pro-Lines International Co. is an incorporated technical outfit that offers professional consultancy services in safety engineering, occupational health and the environment. It was incorporated in 1983, but it actually came into practice in 1999 after my retirement from Exxon Mobil Nigeria Unlimited. My responsibility as chair and CEO is to direct our professional services and to assist our clients in the areas of compliance and practices so as to ensure a safe environment and society.

IPS: Pro-Lines International Co. works in emergency response management with Akwa Ibom State government to create safer working environments and to reduce occupational accidents. How has this coordination helped to improve occupational safety and health within the state?

UU: This coordination has helped to

reduce occupational accidents within the companies with which we consult. We provide consulting services to more than 15 construction companies, and our advice covers everything from new hire orientation to job safety analysis and monitoring.

With respect to emergency response management, we are working on a more reliable mechanism to be implemented with the Red Cross, multinational companies and the government. This will ensure that the employment and deployment of staff, equipment, resources and materials owned by various institutions will produce an effective emergency response.

IPS: The National Emergency Management Agency (NEMA) is responsible for disaster management in Nigeria. How does Pro-Lines International Co. work with NEMA to address emergencies in Akwa Ibom State and throughout Nigeria?

UU: Pro-Lines International Co. has asked two past ministers of aviation in Nigeria to help in disaster management, but we have not received a response from them. We believe that the government of Nigeria would benefit greatly from our proposal to form a wholesome working relationship in disaster management.



Uwemedimo Umoumoh is the chair and CEO of Pro-Lines International Co., an SH&E consulting firm in Akwa Ibom State, Nigeria. Umoumoh has 25 years' experience as an SH&E engineer in the production, manufacturing and oil and gas industries. In addition to his position at Pro-Lines, he is the executive director of Jolimair Nigeria Limited, a building and civil engineering company.

Unfortunately, the Akwa Ibom State government does not have a disaster management plan in place, and Nigeria has yet to implement a visible, viable and responsive mechanism for emergency mitigation. Pro-Lines International Co. has again offered professional assistance to the incumbent

continued on page 2

This Issue

Improving OS&H through Education in Nigeria	1
ASSE Chapter Spotlight: Kuwait	4
IOSH Activities in Taiwan	5
ASSE Chapter Spotlight: Western Australia	8

An Interview with Uwemedimo Umoumoh

continued from page 1

minister of aviation and to NEMA. Once the government allows certified and experienced personnel to correct the established deficiencies in emergency management, we expect that emergencies will be handled more professionally and timely in the future.

IPS: How did Pro-Lines International Co. help to change the way sanitation workers clear refuse in Akwa Ibom State's capital, Uyo?

UU: Before 2004, contractors who were not professionals crudely handled refuse disposal. They used shovels to scoop the refuse into the backs of open trucks (tippers), and workers wore no personal protective equipment (PPE).

Today, thanks to our firm's efforts, one environmentally proficient company picks up and disposes of the refuse mechanically.

IPS: You have 25 years' experience as an SH&E engineer in Nigeria, and your company provides consulting services to the Akwa Ibom State government and to organizations such as Peacock Paints Nigeria Limited and Exxon Mobil Nigeria Unlimited. What is the state government's view of SH&E investment, and how does it support the endeavors of safety engineers and consultants?

UU: Based on my 25 years of experience as an SH&E engineer, I would say that the government does not consider SH&E investment a priority. It appears that the government is concerned about SH&E investment only after a major accident with fatalities occurs. Even then, the government prefers to invest in "short-term" and "fire service" approaches rather than in long-term, comprehensive approaches that would be much more proactive and meaningful.

The government does not support safety engineers or consultants at all. Once

the government sees our input as cost-saving rather than as calls for expenditure, only then will they appreciate the important roles of safety engineers and consultants. The little patronage that safety engineers and consultants receive from organizations and oil companies depends largely on the fact that they are foreign, multinational or require insurance.

The fatality rate and the cost of equipment, materials and retrofitting in government projects is extremely high as a result of safety engineers' and consultants' nonengagement in major projects and constructions.

IPS: As chair and CEO, how do you ensure that effective SH&E practices are followed within Pro-Lines International Co.?

UU: I definitely ensure that effective SH&E practices are followed within Pro-Lines International Co. because as chair and CEO, it is my duty to lay a good ethical foundation for the company. My professional certification and license as well as those of my employees must reflect in the quality of services that we offer our clients. Our duty to provide a reasonably safe environment is an undisputed commitment to our clients and to the society at large.

IPS: You have significant experience in production, manufacturing, oil and gas. What specific SH&E improvements have you witnessed within these industries in Nigeria during your career as an SH&E engineer?

UU: My experience in production, manufacturing, oil and gas makes me proud of my career as an SH&E engineer. Over the years, I have been a part of the following achievements:

1) When I worked in automotive battery production, I promoted safety awareness to the employees, contractors, marketers and community by informing them of the hazards of lead and chemicals and by teaching them how to manage these hazards.

2) When I worked in paper manufacturing, I taught employees how to control forest fires and how to follow safe work practices. In 1991, I was a Commonwealth Foundation Research Scholar in Britain, and I studied forest/commercial plantation firefighting. This experience enabled me to pass on what I learned to a developing country like Nigeria. Upon my return, I trained employees and com-

munities in safety awareness and fire prevention and protection, which they considered beneficial.

3) Over 90% of the employees within Exxon Mobil's operations are contractors. To ensure safe job performance and delivery, I introduced the contractors' safety program and the loss prevention training curriculum for employees. I also reintroduced the SH&E Awareness Anniversary Week celebrations. Although I no longer work for Exxon Mobil, they continue to use all of these initiatives today.

IPS: How is safety awareness promoted to the public in Akwa Ibom State and in Nigeria in general? Do you believe that current safety campaigns are successful? Why or why not?

UU: Promotion of safety awareness in Akwa Ibom State and to the Nigerian public is low. This is because no university or polytechnic school in Nigeria offers safety engineering courses. I proposed to the government that safety be included in the educational curriculum within primary and secondary schools. This will help students to understand what constitutes risk at both their homes and in public.

Also, the mandatory introduction of safety engineering fundamentals and management into all engineering courses as a general requirement will help our young engineering students to gain some knowledge of applied safety, which they can then use in their engineering practices. Until safety is brought into the classrooms in Nigeria, the word "safety" will still be misunderstood by the average Nigerian.

IPS: Pro-Lines International Co. offers consulting services in such areas as safety training and engineering, risk assessment/mitigation and fire protection, among others. From your perspective, which areas have been most in need of your company's expertise, and why do you think this demand exists?

UU: The areas most in need of our services are construction safety, driving safety and project safety. This is because of the low level of personnel used in their execution. Safety consultancy is lacking very much in the construction sector, which has a high rate of collapsed structures and fatalities. Driving in Nigeria is worse than the reflexes of a pilot who is trying to land in bad weather. The poor state of the roads, uneducated drivers and the method of acquiring a driver's license

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all result in high death tolls on Nigeria's roads.

In project management (except for oil companies), the state governments and the federal government do not consider the appointment of a safety engineer or consultant in major projects. This results in expensive retrofitting to correct deficient or ignored safety measures that a safety engineer or consultant could have identified during the project's design stage.

IPS: You are an international member of ASSE. How has your experience as a society member helped you?

UU: Before I joined ASSE, I had been a Fellow of the Nigerian Institute of Safety Professionals and a Member of the International Institute of Risk and Safety Management. As my years of practice grew, I discovered that my qualifications and experience did not provide me with solutions in my position of responsibility. Therefore, I went back to study safety engineering in California and joined ASSE. My ASSE membership is everything that I had expected. Access to the

website and to *Professional Safety* have helped me in my professional practice requirements. My attendance at the recent professional development conference in New Orleans, LA, was tremendously beneficial. I intend to ensure that Pro-Lines International Co. is always represented at ASSE's annual conference. ■

Uwemedimo Umoumoh is chair and CEO of Pro-Lines International Co., an SH&E consulting firm in Akwa Ibom State, Nigeria. Pro-Lines provides companies such as Peacock Painting Nigeria Limited and Exxon Mobil Nigeria Unlimited with consulting services in the following areas:

- audits;
- construction safety;
- contractor safety management;
- defensive driving training;
- drivers screening;
- drivers selection for hiring;
- emergency management and response;
- environmental engineering;
- environmental impact assessment;
- fire protection engineering;
- hazard reviews;
- industrial hygiene monitoring;
- product and system safety engineering;

- risk assessment and mitigation;
- safety engineering;
- safety equipment maintenance;
- safety training;
- SH&E competency and training;
- termite treatment and control;
- waste management.

Pro-Lines also consults with the Akwa Ibom State government on major spills and incidents.

Umoumoh has 25 years' experience as an SH&E engineer in the production, manufacturing and oil and gas industries. Before forming Pro-Lines, he worked as an SH&E supervisor for Mobil Producing Nigeria Unlimited and was head of the fire and safety department at Nigeria Newsprint Manufacturing Co. Limited.

Umoumoh has served as National Secretary General and as chair (Akwa Ibom State Branch) of the Nigerian Institute of Safety Professionals, of which he is also a member, fellow and examiner. He is a member and the current chair of the Akwa Ibom State Branch of the National Industrial Safety Council of Nigeria, and he belongs to ASSE, Industrial Fire Protection Association, International Institute of Risk and Safety Management and National Fire Protection Association. He holds an associate degree in risk and safety management from the British Safety Council in London.

ASSE Chapter Spotlight: Kuwait

Editor's Note: For the last six years, Ashok Garlapati has been a part of ASSE's Kuwait Chapter. As the chapter's current Vice President, he strives to further its growth and development. In this interview, Garlapati discusses the chapter's accomplishments, latest initiatives and objectives for the future.

IPS: What are your responsibilities as Vice President of the Kuwait Chapter?

AG: I have been involved with the Kuwait Chapter since its establishment in 2000. I worked as a head of the Environ-

ment Committee, Secretary-Elect, Secretary and now I serve as Vice President. Since I have been part of the chapter from the very beginning, I take pride in its growth and I work continuously for its development. My responsibilities in the chapter are as follows:

- advising the secretary and other committee heads in the development of strategic plans and their implementation;
- identifying relevant training programs based on members' needs and working with the Training Committee;
- creating more professional SH&E awareness within the industry and society as a whole;
- arranging specialized technical work committees to study SH&E issues;
- working with the Outreach Committee to design and coordinate outreach programs for school children and the general public;
- providing a platform for rendering necessary guidance on SH&E issues within various social groups;
- representing the Kuwait Chapter at ASSE meetings and

events to assess the needs of international ASSE members.

IPS: What do you believe have been the chapter's most significant accomplishments?

AG: Our most significant accomplishments are as follows:

1) We have conducted three international professional development conferences on a regional basis in 2001, 2003 and 2004.

2) The Kuwait Chapter was the first international chapter to achieve highest membership growth in 2005.

3) The chapter proved that ASSE could meet the requirements of international members. Based on the success of the Kuwait Chapter, ASSE's Board of Directors created a taskforce to further enhance ASSE's growth in the international arena.

4) In 2004, the Kuwait Chapter conducted its first national seminar on SH&E regulations in the State of Kuwait.

5) The Kuwait Chapter has developed a series of annual outreach programs, which include a Beach Cleanup Campaign (Feb.



Ashok Garlapati is a health, safety and environmental specialist for Kuwait Oil Co. He is Vice President of ASSE's Kuwait Chapter and was involved in its

establishment in 2000. Garlapati has 18 years' environmental management experience in the oil and gas industry. He is a professional member of ASSE, a member of the International Membership Taskforce and a member of the Council on Member & Region Affairs Most of the World task force.

continued on page 4

An Interview with Ashok Garlapati

continued from page 3

19), World Environment Day (June 5), International Ozone Day (Sept. 16) and SH&E Pupils Week (April).

6) We developed succession planning to ensure that the Executive Committee is transformed every June. The members will be selected each December, and they will work with the current Executive Committee from January through June, then take over in July. This ensures a smooth transformation.

IPS: How does the Kuwait Chapter recruit and maintain members? What kinds of benefits or services does it offer?

AG: Our Membership Committee conducts regular membership campaigns, and members who contribute to chapter development may receive free membership renewal based on approved criteria. We also provide subsidies to members and maintain effective rosters.

Other member benefits include the opportunity to participate in training courses and to network with other SH&E professionals, access to library facilities and free counseling, free admission to the professional development conferences and other technical meetings, and recognition of active members' efforts.

IPS: What SH&E issues are currently of greatest importance to Kuwait Chapter members? How are members coordinating with Kuwait's workforce to address these issues?

AG: Ninety percent of Kuwait's labor force works in the oil and gas industry, and since 95% of the Kuwait Chapter members work in oil and gas, the safety issues and risks involved in oil exploration and refining are of greatest importance to them. Environmental pollution caused by the 1991 Gulf War and associated issues are of great significance to members. Also, Kuwait has one of the highest traffic accident rates per capita, so defensive driving is a key issue for members.

Our chapter members reach out to Kuwait's workforce through public awareness campaigns. We conduct outreach programs for children, and we hold an annual SH&E Pupils Week (similar to North American Occupational Safety and Health Week) as well.

IPS: The Kuwait Chapter regularly

holds member meetings. What topics do these meetings typically cover?

AG: The chapter conducts a monthly Executive Committee members meeting every second Sunday of the month, and it holds monthly technical meetings for members every fourth Sunday of the month. Some of our most recent meeting topics have included:

- challenges of occupational hygiene in oil production;
- International Electrotechnical Commission standards 61508 and 61511;
- medic first aid;
- office ergonomics;
- road safety and defensive driving principles;
- stress and its management in the workplace.

IPS: How does the Kuwait Chapter promote effective SH&E practices among Kuwait's workforce?

AG: We hold frequent technical meetings on SH&E topics for ASSE members, other SH&E professionals and the general public. We conduct safety awareness programs for schoolchildren, and we organize beach cleanup campaigns throughout Kuwait.

We have conducted some programs for oil refineries, which include defensive driving, awareness of Environmental Protection Agency regulations, and courses on ISO 14001 and OHSAS 18001 lead auditor. We also participate in local companies SH&E Open Day functions to promote ASSE and its benefits to SH&E professionals.

IPS: The Kuwait Chapter has grown considerably since it was first established. To what does the chapter attribute this success?

AG: We attribute our success to our members' commitment. And thanks to the success of our training programs and member discounts, we are able to both attract and retain our members. In most interviews, engineers are often asked whether they are ASSE members. Also our website provides most of the updated information on SH&E regulations in the State of Kuwait.

IPS: How can members make the most of their participation in the Kuwait Chapter?

AG: Our chapter is divided into five committees in which members can participate—training, public awareness, outreach, government affairs and

membership. In addition to volunteering in these committees, members can help plan our monthly meetings and annual programs and activities.

IPS: What are the Kuwait Chapter's plans for this year?

AG: This year, we plan to:

- develop an interactive website that will serve as a good online resource for SH&E professionals;
- establish a student chapter;
- hold our fourth professional development conference;
- establish an occupational health forum.

IPS: How has your involvement in the Kuwait Chapter and in ASSE in general helped you in your professional career?

AG: Since I joined the Kuwait Chapter in 2000, I have had the chance to take part in many ASSE-sponsored events and to volunteer my time in several different capacities. ASSE has helped me network with other SH&E professionals, and the localized workforce here in Kuwait recognizes me as a resource for SH&E information.

My employer, Kuwait Oil Co., is also very supportive of my involvement in ASSE. They value what I learn through the Society, and they encourage me to implement this knowledge in my job. ■

Ashok Garlapati is a health, safety and environmental specialist for Kuwait Oil Co. He is Vice President of ASSE's Kuwait Chapter and was involved in its establishment in 2000. He has 18 years' environmental management experience in the oil and gas industry.

Garlapati is a professional member of ASSE, a member of its International Membership Taskforce and a member of the Council on Member & Region Affairs Most of the World task force to increase ASSE's global representation. He holds a bachelor's degree in environmental engineering from Shivaji University in Kolahpur, India, and a master's degree in business management from Madurai Kamraj University in Tamil Nadu, India. He also holds SH&E certification from the National Safety Council, and is a lead auditor of the ISO 14001 and OHSAS 18000 series.

IOSH Activities in Taiwan

Editor's Note: *Tung-Sheng Shih, who has 27 years' experience in industrial hygiene, is chair of the Institute of Occupational Safety and Health (IOSH) in Taiwan. In this interview, Shih describes the methods, techniques and equipment IOSH uses to help reduce occupational injuries, disabilities and fatalities in Taiwan. He discusses the institute's current research and development initiatives to better identify, treat and prevent occupational illnesses and ergonomic injuries, and he offers suggestions for improving safety and health management policies.*

IPS: Provide a brief overview of IOSH in Taiwan and of your responsibilities as chair.

TSS: IOSH is Taiwan's top governmental occupational safety and health research body. It was established in August 1992 primarily to promote safety in the workplace through the application of science and technology, to survey and to analyze hazards in the working environment and to propose measures for improvement.

My main responsibilities as chair are to secure a sufficient budget to allow us to perform our assigned tasks, to communicate with our parent organization, the Council of Labor Affairs, and other organizations, such as the National Science Council, and to gather ideas from enterprises and labor unions about how we can direct our research toward the needed areas. Internally, I direct and supervise all of the research work in which IOSH is engaged. The vision of IOSH during my tenure is to incorporate Taiwan's future into our work and to share the achievements of IOSH's research and development with the international community.

IPS: Taiwan's continued economic development and rising employment has led to the increased use of hazardous materials and more complex machinery in the workplace. In 2004, 38,443 workers in Taiwan suffered injuries, disabilities or death while on the job. Compared to last year's results, has IOSH seen a decrease in worker injuries, disabilities and fatalities thus far in 2005?

TSS: Yes, we have witnessed an overall decline in 2005. In the first half of this year, injuries, disabilities and deaths totaled 18,070, a decrease from 18,250 in the corresponding period in 2004. Over the same period, the number of injuries (those that resulted in hospitalization for at least three

days) actually increased slightly from 16,154 to 16,160. Permanent disabilities fell from 1,911 to 1,744, and deaths dropped from 185 to 166. While we are encouraged by these improvements, it is evident that we still have more work to do.

IPS: IOSH is currently developing technology to identify hazards, such as fires and explosions, that occur during plastic hardener batch reactions. What is the status of this research, and how will it improve the monitoring and control of major chemical and construction hazards?

TSS: This project has already been completed. Based on the results, we have revised the regulations to provide a self-compliance program for small- and medium-size enterprises, and we have mapped out a 4-year plan (until 2008) to investigate the causes of chemical hazards that occur in batch reactors (such as fires, explosions, thermal explosions and toxic releases) in greater detail. Also, we have developed a specific quantitative checklist for exothermic batch reaction systems, and we have provided detailed and practical safety guidelines for these systems.

These improvements are promoted among chemical enterprises through cooperation with the Chemical Industry Association. We also delivered the information to enterprises through the IOSH publication *Safety Alert* and published it on the IOSH website. This should substantially improve monitoring and control for the chemical industries of Taiwan.

IPS: To improve safety monitoring hardware and software for older equipment at chemical plants and construction sites, IOSH plans to:

- conduct a risk evaluation;
- establish a system that will delineate explosion danger zones;
- improve online monitoring systems for fire alarms and safety facilities;
- develop safety monitoring and accident-prevention technology for the construction industry;
- integrate safety evaluation management systems and early warning systems.

What kinds of resources and methods will IOSH use to carry out the above tasks?



Tung-Sheng Shih is chair of the Institute of Occupational Safety and Health in Taiwan. Shih has 27 years' experience in industrial hygiene, and he has written 91 papers for Science Citation Index (SCI) journals, 67 papers for non-SCI journals and 91 conference papers. He also holds 15 patents.

TSS: First, we will use quantitative risk analysis to help assess hazard risks at chemical plants and construction sites. Based on the results of this assessment, we will modify the existing emergency response plans. Second, we will use non-destructive techniques to inspect equipment at chemical plants and at construction sites.

This work is facilitated by the fact that IOSH personnel are authorized to enter workplaces to conduct inspections at any time, and IOSH has several laboratories which can conduct testing in mechanical, construction, chemical and material safety. Also, we have close cooperation with outside academic and research institutions such as National Taiwan University, which helps us in this work.

We maintain a database on serious accidents and another one on claims for injury, permanent disability and death, which are submitted to the Bureau of Labor Insurance. These databases give us a good overview of occupational safety and health in Taiwan.

Furthermore, we routinely collect information on the latest techniques when performing these tasks. All records of local routine inspections and injury identification investigations are sent to IOSH, so that we have the latest data on accidents and injuries which occur in the workplace and can conduct further analysis.

Due to our status as a government institute, the techniques we developed can be put into practice by state-run enterprises. To promote these techniques, we maintain good connections with industry unions and related associations.

IPS: IOSH maintains that a well-established safety and health management

continued on page 6

An Interview with Tung-Sheng Shih

continued from page 5

system can help to reduce the risk of disaster and to improve safety performance within the construction industry. To equip construction firms with the appropriate tools to conduct effective safety risk management and performance evaluations, IOSH plans to:

- study the relationship between improved occupational safety and property insurance premiums and safety and health management;
- establish evaluation technology, a risk grading system, an early warning system and a localized risk management evaluation system;
- develop an expert system to support emergency response decision making;
- apply construction management information to accident prevention monitoring and control.

What is your projected timeline to complete the above initiatives, and how will IOSH work with construction firms to ensure that they properly implement their safety and health management systems?

TSS: All of these initiatives will be implemented by 2008. In 2005, IOSH collected basic data on the risk of accidents and conducted inspections of construction firms to ensure compliance with safety regulations. From 2006 to 2007, we will integrate onsite information and transmit it to the monitoring center for validity testing and analysis. In 2007, we will encourage enterprises to use our research results to improve their work processes. For example, we will ask them to implement the monitoring and early-warning systems that we have developed.

In 2008, we will develop risk-quantifying software to provide cost/benefit ratios for decision-making purposes. In addition, we will propose a simple and effective safety management system based on Taiwanese culture. We also offer economic incentives, such as reduced insurance premiums for companies that can demonstrate reduced risk, to encourage them to invest in safety measures.

IPS: To help identify, treat and prevent occupational illnesses, IOSH's Analysis Methods Division has developed sampling and analytical methods, biological monitoring methods as well as new

sampling techniques and equipment. Which methods, techniques or equipment do you believe have made the most positive impact on occupational health in Taiwan?

TSS: The division has developed more than 200 sampling and analytical methods for regulated hazardous substances that take into account the temperature and humidity effects in Taiwan. In addition, since 1998, the division has developed six new personal samplers that show the extent of health hazards for workers.

All of these samplers can meet the respirable convention as prescribed by the American Conference of Governmental Industrial Hygienists, the International Organization for Standardization and the European Committee for Standardization and can induce the least shift of performance curve under heavy dust loading, which provides the most accurate measurement of atmospheric dust and gas components.

Also, the samplers are small in volume, lightweight, airtight and easy to disassemble and clean with minimal interference from static electricity. Since free silica-induced pneumoconiosis and inorganic acid/base- and toluene di-isocyanate-induced asthma are the most concerned occupational diseases in Taiwan, these new patented size-selective samplers most impact occupational health in Taiwan.

IPS: IOSH's Occupational Safety Division studies safety with respect to the mechanical, electrical, construction and chemical industries, and it also researches safety management policies. How do safety management policies affect injury and incident rates within each industry? In what ways can companies improve their own safety management policies?

TSS: In recent years, safety management policies have emphasized commitment by top management, development and implementation of occupational safety and health management systems, and cooperation among workers, employers and government. Therefore, IOSH is currently developing a general guide for occupational safety and health management systems in reference to the 2001 International Labor Organization occupational safety and health guide that covers enterprises, specific industries and nationwide application, and it will submit the

guide to the Council of Labor Affairs as a national guide. Enterprises will be able to formulate safety improvement strategies and to develop individual occupational safety and health policies based on the guide.

In addition, IOSH believes that worker participation, education and training and the promotion of a safety culture are also ways in which companies can improve their safety management policies. Therefore, IOSH has developed a safety culture questionnaire and has established norms for the reference of the construction and steel industries.

This emphasis has resulted in a significant decrease in major occupational accident fatality rates over a 4-year period. From 2000 through 2004, the fatality rate per thousand workers for industry as a whole dropped from 0.0969 to 0.0671; from 0.3227 to 0.2302 for the construction industry; from 0.0545 to 0.0342 for the manufacturing industry; and from 0.527 to 0.516 for all other industries.

IPS: IOSH's Occupational Hygiene Division evaluates and controls ergonomic hazards. What new methods or technologies is the division currently researching to prevent ergonomic injuries in the workplace?

TSS: Among IOSH's new methods for preventing ergonomic injuries is the "Work-Field Monitoring Technology for Investigating Repetitive Strain Injuries in Upper Limbs," one of the evaluation technologies IOSH recently developed. This technology will help us to better understand the causes of cumulative trauma disorders and the interactions between hazard factors.

To achieve this, a portable data logger and interactive data analysis software have been developed. The data logger records a worker's heart rate, joint angles, repetitive frequency and magnitude of muscle exertion during working hours over a long period of time. After the recorded data are collected, the interactive data analysis software further processes it by automatically quantifying the ergonomic risk factors of the workers. As a matter of fact, several tests have been conducted and have proven that the data logger has great reliability and stability. In the near future, this technology can be applied in evaluating the performance of workers in a variety of occupations so as to reduce their occupational hazards.

Parallel to its research and development work on new methods and technologies, IOSH continuously dispatches personnel to factories to offer assistance and guidance in improving their real-time working conditions. IOSH will continue to use this two-pronged approach to better prevent ergonomic injuries in the workplace.

IPS: Fifteen IOSH-developed products have received patent approval. Which product(s) have most reduced occupational injuries and illnesses in Taiwan and worldwide?

TSS: One noteworthy product is our Exhaust Device for Anatomical Operation, which has received patent approval in the U.S. and in Taiwan. This system includes a laminar flow generator and a dissection table, and it uses air flow to generate a push-pull effect that fully removes a cadaver's formalin vapors and unpleasant odors from the anatomical laboratory environment, and prevents those vapors and odors from spreading and polluting the air. This reduces workers' exposure to a harmful working environment.

Results show a favorable response from medical students, teachers and technicians, and indicate that this system is effective in reducing concentrations of formalin and in alleviating feelings of discomfort during periods of exposure. The use of this equipment reduces the concentration of formaldehyde from 1.8-5 parts per million (ppm) before installation to just 0.12 ppm or less or even to undetectable levels. Most medical schools in Taiwan have adapted this equipment to reduce formaldehyde exposure.

IPS: IOSH has established basic safety and health databases for workers in Taiwan. Explain how these databases work and what the benefits are of each.

TSS: The establishment of basic occupational safety and health databases provides a foundation for the long-term development of occupational safety and health technology in Taiwan. Building such databases requires intensive investments in human resources and funds, and their usefulness is difficult to ascertain in the short run.

All of the databases are maintained and updated routinely. As a result of careful research planning over the years, IOSH has established the following basic databases:

1) Workers' dynamic and static anthropometry with CD-ROMs available for searches among 42 dynamic and 262 static anthropometric datasets.

2) Workers' hearing thresholds. The purpose is to establish hearing ability norms for workers of different sexes and age groups for use in hearing loss evaluation and in the promotion of occupational hearing protection plans.

3) Workers' head and face anthropometry. These data are used to make test mannequins for the development of safety helmets, goggles and respiratory protective equipment.

4) Workers' blood test norms for the evaluation of occupational exposure and its effects on health.

5) Workers' health fitness norms. This database can help to determine the physical conditions of workers in various industries for the establishment of workplace health promotion plans so as to maintain workers' health, elevate their level of health and fitness, and prevent occupational injuries.

6) Basic metabolic physiology of workers. This data can be used to calculate metabolic rates of workers in different types of operations, which can then be used as a basis for the establishment of labor standards.

7) Reference values for biophysical modeling, which can be used as a basis for the determination of musculoskeletal disorders.

8) Database of material safety data sheets. This is open to the public and provides information on chemical hazards and emergency response.

9) Database of occupational injuries. This is also open to the public, and it provides information on the circumstances and causes of occupational injuries. It serves as a reference in the development of injury prevention means as well.

10) Occupational hygiene conditions in medical facilities. By providing information on workplace hazards that are specific to hospitals and clinics and on the number of workers exposed to those hazards, we can rank the severity of different hazards for use as a reference for administrative action.

11) More than 200 reference methods for the sampling and analysis of hazardous chemical substances, which are used as a basis for the promotion of environmental monitoring systems in the workplace.

12) Basic information on the impact that hand motions produce, which can be used as a reference in establishing standards for repetitive applications of force in order to prevent cumulative musculoskeletal disorders of the hand.

13) Workplace chemical hazards. This database contains data on chemical hazard exposure by industry and provides information on the numbers of workers exposed as well as risk indexes for legislative and labor inspection purposes. The data are also used as a reference in revising regulatory standards and in setting inspection priorities.

IPS: IOSH is developing an occupational injury and disease reporting system. What is the status of this project, and how will the system be implemented in Taiwan upon its completion?

TSS: This is a sustained effort. We routinely collect the health examination records of workers who are exposed to lead, noise and to specific hazardous chemicals. We also monitor cases of occupational disease by analyzing the claim data for workers' compensation provided by the Bureau of Labor Insurance.

In addition, local inspection agencies' investigation reports for serious occupational accidents are collected and transferred to IOSH to clarify the causes of injury events. Other agencies such as the Bureau of Health Promotion and the Bureau of National Health Insurance manage data on suspicious cases of occupational disease.

IOSH takes part in routine monthly meetings with the other agencies to validate the overall amount of data delivered from different channels. Cases with abnormally high exposures are screened, and further field investigations are conducted to identify the possible sources of exposure. Through this procedure, more accurate occurrence rates of occupational disease can be calculated, and more effective preventive methods can be developed.

IPS: You worked in industrial hygiene for 27 years. How has that experience helped you in your position as chair of IOSH?

TSS: I am lucky to have taken part in the long-term development of occupational safety and health practices in Taiwan ever since I was a junior researcher. For

continued on page 9

ASSE Chapter Spotlight: Western Australia

Editor's Note: *The Western Australia Chapter is one of ASSE's newest additions. The chapter has recently developed a short-term strategic plan, and it aims to increase its membership to more than 200 by 2008. In this interview, Brian Brown, Executive Officer and Board Secretary of the Western Australia Chapter, describes the chapter's accomplishments to date and explains their goals for this year.*

IPS: What is your role in the Western Australia Chapter?

BB: I am the Executive Officer and Chapter Board Secretary. My role is modeled according to the guidelines found in the Council on Member and Region Affairs' 2005 administrative files.

IPS: What do you believe have been the chapter's most significant accomplishments?

BB: In 2005, the chapter was ratified, which proved to be a milestone for the Western Australia safety fraternity. We also developed a short-term strategic plan for 2006-08.

IPS: How does the Western Australia Chapter recruit and maintain members? What kinds of benefits does it offer?

BB: The Liaison Committee membership and inaugural board members have generated most of our recruitment. However, the recently formed Membership Subcommittee plans to achieve the target numbers as outlined in our strategic plan—200+ members by 2008. Membership will, as has been the case to date, be drawn from both tertiary and nontertiary qualified persons from within the profession.

ASSE currently makes benefits and services available for members; however, these will be addressed for Australian members as they become evident.

IPS: What SH&E issues are currently of greatest importance to Western Australia Chapter members? How are members coordinating with Western Australia's workforce to address these issues?

BB: At this stage, we are still determining our membership's needs since our members are scattered across a very large area. We will address this at the first formal meeting of the Western Australian Chapter, which took place on May 3, 2006.

At a previous member gathering held at the Fremantle Sailing Club in November 2005, shortly after receiving our chapter charter and the appointment of the inaugural chapter board, Dr. Roger Brauer, executive director of the Board of Certified Safety Professionals (BCSP) gave a presentation. Support for the CSP qualification as well as support for and promotion of young persons within the industry were topics that raised significant interest.

IPS: What topics do Western Australia Chapter meetings usually cover?

BB: As previously stated, our first formal membership meeting is scheduled for May 3, 2006; however, since receiving our charter, the inaugural board determined that a short-term strategic plan would be most beneficial. From this initial plan, an accountability "model" emerged. This model will be the first item on the agenda at our membership meeting.

IPS: How can members make the most of their participation in the Western Australia Chapter?

BB: At this point, there has been minimal member participation other than involvement in bringing to fruition the aspects of our strategic plan. "Accountable persons" within the chapter must tap into members' skills to assist in the implementation of the strategic plan.

Members can ensure that current and future employers are made aware of their affiliation and of what this can mean for their workplace in terms of global networking opportunities. They can also ensure that loss insurers are cognizant of ASSE's many available resources.

IPS: What are the Western Australia Chapter's plans for this year?

BB: We plan to put the strategic plan into effect and to meet with as many members as geographically possible while generating a continued growth pattern.

In May, chapter representatives met with Dr. Brauer to discuss CSP qualification, and in June, there was chapter representation at the Professional Development Conference in Seattle, WA.

Brian Brown is Executive Officer of the Western Australian Chapter of ASSE and Chapter Board Secretary.

Prior to his involvement in the formation of the Western Australia Chapter, Brown served as an associate, consultant and senior occupational safety and health consultant with IFAP, a not-for-profit safety organization in Australia, which Brown joined in August 1995.



IPS: How has your involvement in the Western Australia Chapter and in ASSE in general helped you in your professional career?

BB: Given our fledgling status, tasks associated with chapter ratification have been both stimulating and rewarding. Such aspects include the legality associated with bylaw/constitution preparation as well as with the numerous aspects of corporate governance, which has and will continue to be my own personal challenge.

Brian Brown is Executive Officer of ASSE's Western Australian Chapter and Chapter Board Secretary. He served as Chair of the Chapter Formation Liaison Committee from March 2005 to September 2005. The Liaison Committee gathered and submitted the necessary information for the Western Australia Chapter's formation, the culmination of which was charter ratification and presentation in November 2005.

Prior to his involvement in the formation of the Western Australia Chapter, Brown served as an associate, consultant and senior occupational safety and health consultant with IFAP, a not-for-profit safety organization in Australia, which Brown joined in August 1995. During his 39-year engineering career, Brown completed a 5-year apprenticeship followed by 17 years in the British Mercantile Marine with 8 of those 17 years spent in senior engineering positions.

Upon completion of his marine engineering studies, Brown spent years within the power generation and distribution division of a major iron ore producer in the northwest of Western Australia.

Brown holds a graduate diploma in occupational health and safety and a master of science degree (health science) from Curtin University. He also has experience in applied occupational safety and health research.

**An Interview with
Tung-Sheng Shih**
continued from page 7

eight years, I was an inspector in charge of occupational health inspection work. After that, I acted as an official in the Division of Occupational Safety and Health, Taiwan's equivalent of OSHA, for 5 years. Then I was promoted to chief of IOSH's Analysis Methods Division in 1992, and finally, I was appointed chair in 2003.

In all of these positions, I was able to accumulate plenty of practical experience, which is useful to me in my current job. I also had the opportunity to form friendships with most of the occupational safety and health researchers in Taiwan. They always provide constructive advice and share their valuable experiences with me, which is invaluable in our efforts to protect the health of our workers. ■

Tung-Sheng Shih is chair of the Institute of Occupational Safety and Health (IOSH) in Taiwan. Shih has 27 years' experience in industrial hygiene, and he has written 91 papers for Science Citation Index (SCI) journals, 67 papers for non-SCI journals and 91 conference papers. He also holds 15 patents.

In his professional career, Shih has received the following honors:

- 2000—David L. Swift Award (co-author, American Industrial Hygiene Conference and Exhibition);
- 2001-2004—Outstanding Research Award;
- 2003—William P. Yant Award (American Industrial Hygiene Conference and Exhibition);
- 2003—Outstanding Award on Occupational Disease Prevention;
- 2004—Outstanding Contribution Award of Civil Servant.

He holds a bachelor's degree in chemistry from National Taiwan Normal University, an M.S. in chemical exposure assessment/control from National Tsing Hua University and a master of science/doctor of science degree in occupational health from Harvard University's School of Public Health.

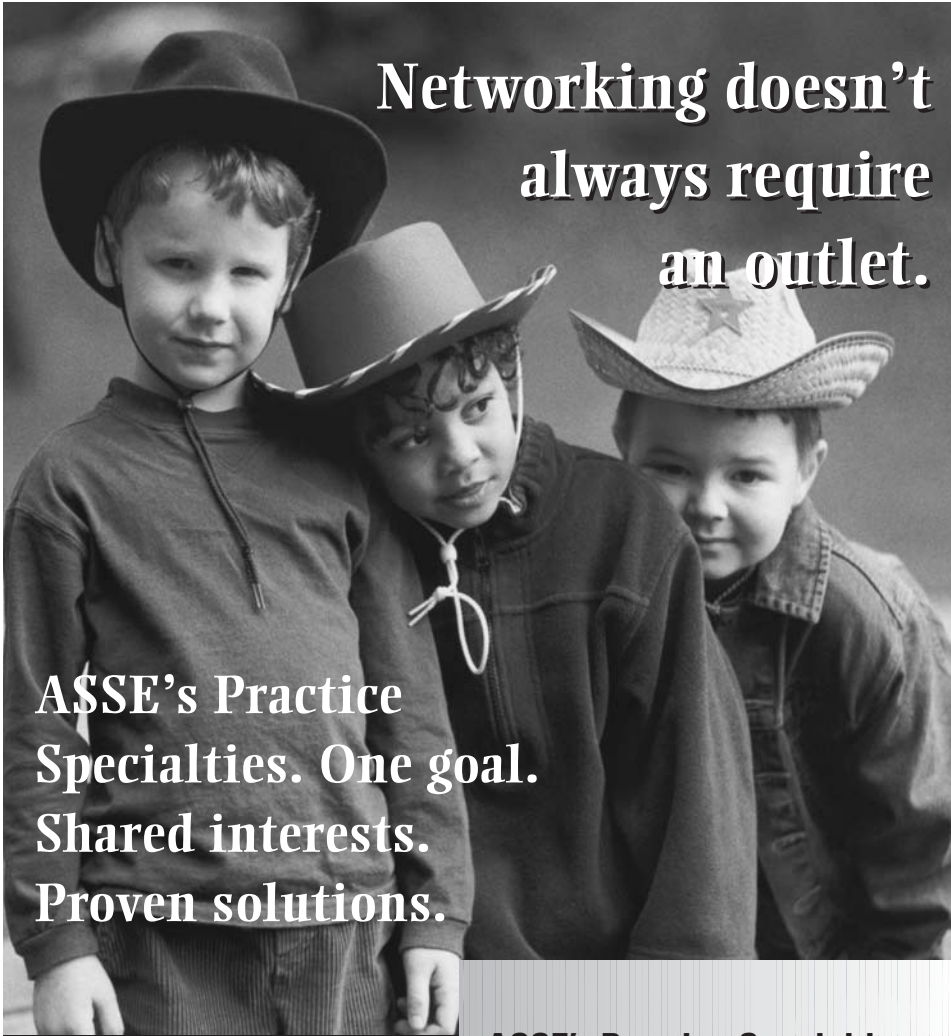
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