# WORLD SAFETY JOURNAL

## ESP - Enhanced Safety Principles

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- **The Role Everyone Plays in Contributing to Successful OSH Management in the Workplace**
- **Occupational Safety and Health Management Systems: A Literature Review Exploring Best Practice**
- **Impacts of Streptococcus Suis Infection**
- **Occupational Health & Safety Education for Professionals/ Practitioners in the Construction Industry**
- **Occupational Safety and Health Performance Index for Safety and Health Management Systems**

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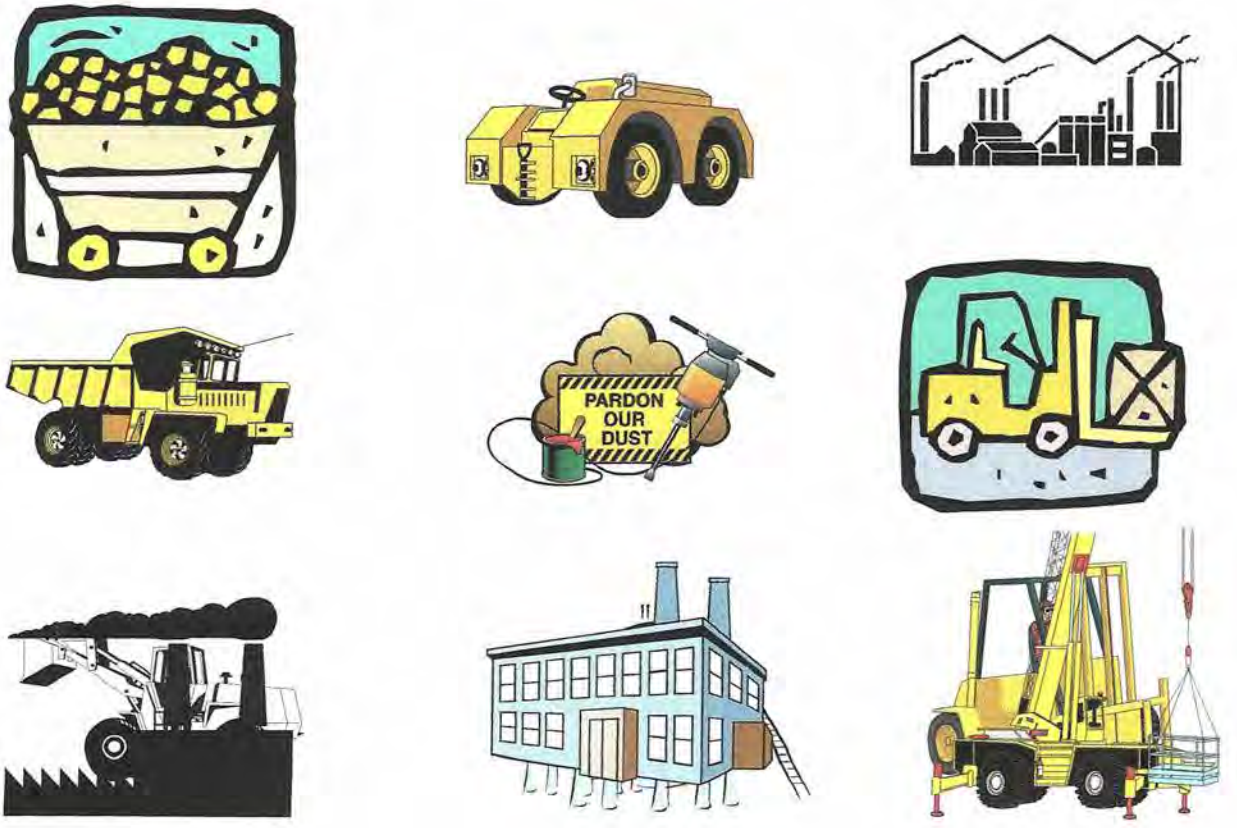

# WORLD SAFETY ORGANIZATION (WSO)

**Profile**

The WSO was founded in 1975 in Manila, The Republic of the Philippines, as a result of a gathering of over 1,000 representatives of safety professionals from all continents at the First World Safety and Accident Prevention Congress. The WSO World Management Center was established in the United States of America in 1987 to be responsible for all WSO activities, the liaison with the United Nations, the co-operation with numerous Safety Councils, professional safety/environmental (and allied areas) organizations, WSO International Chapters/Offices, Member Corporations, companies, groups, societies, etc. The WSO is a not for profit corporation, non-sectarian, non-political movement to **"Make Safety a Way of Life"**.

**World Safety Organization Activities**

The World Safety Organization:

- Publishes WSO Newsletters, World Safety Journal - ESP, and WSO Conference Proceedings.
- Provides a network program linking various areas of professional expertise needed in today's international community.
- Develops and accredits educational programs essential to national and international safety and establishes centers to support these programs.
- Annual awards include the World Environmental/Occupational Safety Person Award, WSO James William Award, WSO Educational Award, WSO Concerned Citizen Award, WSO Concerned Safety Professional, WSO Concerned Company/Corporation Award, WSO Concerned Organization Award, Chapter/International Office of the Year Award, WSO Award For Achievement In Scientific Research and Development and International Award.
- Provides recognition for safety publications, films, videos and other training and media materials that meet the WSO required educational standards.
- Receives proposals from professional safety groups/societies for review and if applicable, submits them to the United Nations for adoption.
- Establishes and supports divisions and committees to assist members in maintaining and updating their professional qualifications and expertise.
- Chapters and International Offices located throughout the world provide contact with local communities, educational and industrial entities.
- Organizes and provides professional support for international and national groups of experts on all continents who are available to provide expertise and immediate help in times of emergencies.

**Membership Benefits**

The World Safety Organization:

- Publishes the "WSO Consultants Directory" as a service to its Members and to the Professional Community. Only WSO Certified Members may be listed.
- Collects data on the professional skills, expertise and experience of its Members in the WSO Expertise Bank for a reference when a request is received for professional expertise, skill, experience.
- Provides a network system to its Members whereby professional assistance may be requested by an individual, organization, state or country on a personal basis. Members needing assistance may write to the WSO with a specific request and the WSO, through its Membership and other professional resources, will try to link the requester with a person, organization or resource which may be of assistance.
- Provides all Members with a Membership Certificate for display on their office wall and with a WSO Membership Identification Card.
- Awards a certificate of Honorary Membership to the corporations, companies and other entities paying the WSO Membership and/or WSO certification fees for their employees.
- Members receive WSO Newsletters, and other membership publications of the WSO.
- Members are entitled to reduced fees at seminars, conferences and classes, given by the WSO. This includes local, regional and international programs. When continuing Educational Units are applicable, an appropriate certificate is issued.
- Members who attend conferences, seminars and classes receive a Certificate of Attendance from the WSO. For individuals attending courses sponsored by the WSO, a Certificate of Completion is issues upon completion of each course.
- Members receive special hotel rates when attending safety programs, conferences etc., sponsored by the WSO.

**Table of Contents**



## ARTICLE SUBMISSION

Articles for inclusion in this journal will be accepted at anytime. However there can be no guarantee that the article will appear in the following journal issue.

All articles shall be written in concise English and typed with a minimum font size of 12 point. Articles should have an abstract of not more than 200 words. Articles shall be submitted as Time New Roman print and on a 3.5" diskette with the article typed in rtf (rich text format) and presented in the form the writer wants published. On a separate page the author should supply the author's name, contact details, professional qualifications and current employment position. This should be submitted with the article.

Writers should include all references and acknowledgments. **Authors are responsible for ensuring that their works do not infringe on any copyright. Failure to do so can result in the writer being accountable for breach of copyright.** The accuracy of the references is the author's responsibility.

**References.**

Articles should be referenced according to the Publication Manual of the American Psychological Association 2002. For example. Books are referenced as follows.

Author. (Year of publication). *Title of publication*. Place of Publication: Publisher.

Articles are referenced as follows.

Author (Year). Title of article. *Name of Journal. Volume* (Issue), Page numbers of article.

Internet information.

Name of author. (Year of publication).*Name of article*. [on-line]. Available WWW:http:// and the rest of the internet path address. [Access date].

Submissions should be sent to:

Debbie Burgess
World Safety Organization
106 W Young Avenue, Suite F, PO Box 518
Warrensburg Missouri, 64093, United States of America
Or Emailed to editorialstaff@worldsafety.org

Articles, where ever possible, must be up-to-date and relevant to the Safety Industry.
All articles are Blind Peer Reviewed by at least two referees before being accepted for publication.

# WSO International Office's and Directors

**Australia:**
Dr. Janis Jansz
c/o School of Public Health, Curtin University of Technology,
Perth 6845, Western Australia,
Phone: (61 8) 9266 3006 Fax: (61 8) 9266 2358
email: j.jansz@curtin.edu.au

**Czech Republic:**
Dr. Milos Palecek
c/o Occupational Safety Research Institute
Jenuzalemska 9, 11652 Prague 1, Czech Republic
email: palecek@vubp-praha.cz

**Ghana:**
Mr. Kofi M. Amponsah
c/o Amponsah Architects, PO Box 93883, Accra, Ghana
email: amponsah@africaexpress.com

**Lebanon:**
Dr. Elias M. Choueiri
c/o Ministry of Transportation, PO Box 401
Hazmieh, Lebanon
email: eliasch@inco.com.lb

**Macedonia:**
Mr. Milan Petkovski
c/o Macedonian Occupational Safety Association
Makedosnko Zdruzenie Za Zastita Pri Rabota, U1
"Nevena Georgieva Dunja", Br. 13 Lokal 1
1000 Skopje Macedonia
email: kontakt@mzzpr.org.mk www.mzzpr.org.mk

**Malaysia:**
Dr. James C. Fernando
c/o OSHALOG Fire Safety Consultant Services SDN BHD
Lot 2331, Ground Floor, Jalan Dato Muip, Piasau
Bulatan Commercial Center, 98000 Miri,
Sarawak, East Malaysia
email: asafe@pd.jaring.my

**Marianas Islands:**
Mr. Marvin C. "Ike" Iseke
c/o Networld CNME, Inc., Middle Road, H.K.
Pangelianna Bldg., Chalan Laulan, PO Box 7724 SVRB
Saipan MP 96950

**Republic of the Philippines:**
Eng. Alfredo A. De La Rosa, Jr.
2nd Floor, Xanland Place Building, 323 Katipunan Avenue
1108 Quezon City, Philippines
email: info@wsophil.org

**Poland:**
Prof. Danuta Koradecka, MD
c/o Central Institute for Labour Protection
Czerniakovska 16, 00-701 Warsaw, Poland
email: dakor@ciop.pl

**Russia:**
Prof. Dr. Edouard Petrossiants
c/o Research Center for Socio-Economic Studies of
OS&H, Obolenskiy per., 10 Moscow, Russia 119829 CIS
email: ohrantr@fednews.ru

**Singapore:**
Dr. M. Jeyaraj
c/o Dynamic Security Pte Ltd, 151 Chin Swee Road
06-15 Manhattan House, Singapore 03116
email: dynamicz@singnet.com.sg

**Slovakia:**
Ing. Teodor Hatina
c/o Occupational Safety Research & Educational
Institute, Trnavska Cesta 57, 814 35 Bratislava
Slovakia

**Taiwan, Provence of the Republic of China:**
Dr. Shuh Woei Yu
c/o Safety and Health Technology Center / SAHTECH Rm. 413,
Bldg 52, No. 195, Sec 4, Chung Hsing Road
Chutung, Hsinchu 31040 Taiwan ROC 310
email: swyu@sahtech.org

**Ukraine:**
Dr. Konstantin N. Tkachuk
c/o Labour Safety State Committee of Ukraine,
Sheveehenko Blvd 8/26 252005
Kiev - 4 Ukraine

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**Membership:** The World Safety Organization has members that are full time professionals, executives, directors, etc., working in the safety and accident prevention fields and include university professors, private consultants, expert witnesses, researchers, safety managers, directors of training, etc. They are employees of multinational corporations, local industries, private enterprises, governments and educational institutions. Membership in the World Safety Organization is open to all individuals and entities involved in the safety and accident prevention field. Regardless of race, color, creed, ideology, religion, social status, sex or political beliefs.

## Membership Categories

✓**Associate Member:** Individuals connected with safety and accident prevention in their work or interest in the safety field. This includes students, interested citizens, etc.

✓**Affiliate Membership:** Safety, hazard, risk, loss and accident prevention practitioners working as full time practitioners in the safety field. Only Affiliate Members are eligible for the WSO Certification and Registration Programs.

✓**Institutional Member:** Organizations, corporations, agencies and other entities directly or indirectly involved in safety activities and other related fields.

Annual Membership fee in United States Dollars is as follows:

| | | | |
|---|---|---|---|
| Student Membership | $ 35.00 | Associate Membership | $ 55.00 |
| Affiliate Membership*) | $ 80.00 | Institutional Membership**) | $185.00 |
| Corporate Membership**) | $1,000.00 | **Please circle the membership you are applying for** | |

*) For your countries fee rate, please contact the World Management Center at info@worldsafety.org

**)For this membership, please indicate name, title and mailing address of the authorized representative.

**APPLICATION FOR WORLD SAFETY ORGANIZATION MEMBERSHIP**

Please print or type:

Name (Last, first, middle): _____

Complete Mailing Address (please indicate if this is a Home or Work address): _____

_____

_____

Work Telephone Number: _____ Fax Number: _____

Home Telephone Number: _____ email:

For Affiliate Members only

Only FULL TIME PRACTITIONERS in the safety/environmental/accident prevention and allied fields are eligible for the WSO Affiliate Membership. Briefly describe your present employment position, or enclose your CV. _____

_____

_____

Please specify your area of professional expertise. This information will be entered into the WSO "Bank of Professional Skills" which serves as a pool of information when a request for a consultant/information/expertise in a specific area of the profession is requested.

| | | |
|---|---|---|
| ( ) Occupational Safety & Health | ( ) Fire Safety/Science | ( ) Environmental Health & Safety |
| ( ) Security/Safety | ( ) Safety/Loss Control Science | ( ) Public Health/Safety |
| ( ) Construction Safety | ( ) Transport Safety | ( ) Industrial Hygiene |
| ( ) Safety Research | ( ) Aviation Safety | ( ) Ergonomics |
| ( ) Product Safety | ( ) Risk Management | ( ) Petroleum Safety |
| ( ) Nuclear Safety | ( ) HazMat Management | ( ) Other _____ |

**Please forward Application and check/money order or charge card information to:**

WSO, World Management Center, 106 West Young Avenue Suite F,
PO Box 518, Warrensburg, MO, 64093, USA

If you would prefer you can pay by Visa ❑; Master card ❑; Discover ❑ or American Express ❑:

Card Number: _____ Expiration Date: _____ Security Code: _____

# WSO International Office Reports

## WSO International Office for Australia

submitted by: Dr. Janis Jansz

Research Work

(1) *Title:* **Occupational Safety and Health Knowledge Survey of Incoming University Students**

*Progress to date:*

A survey of commencing university students was conducted in semester one in 2006 + 2007 + 2008 which resulted in 8,065 student responses to analyze. The same patten of responses were provided over each of the 3 years that this research was conducted. The main themes identified to write articles for publication about have been (1) Lack of occupational safety and health knowledge of beginning university students. (2) Different disciplines, e.g. engineering, nursing, business management, made no difference to the incidences of occupational safety and health education previously received by students or the main occupational safety and health issues of concern identified. (3) Education that included assessment was more effective in improving occupational safety and health knowledge then education without assessment. (4) The average age of respondents was 20 years old. The main occupational safety issues of concern for these students were (a) workplace safety, (b) the need to improve their personal knowledge of occupational safety and health, © bullying.

*Next Steps:*

Need to write articles for publication about the research findings and then apply for research funding to research what occupational safety and health knowledge employers would like university graduates to have. Proposed article titles:

- What occupational safety and health issues most concern students commencing university education?
- Does work experience have an effect on university students' occupational safety and health knowledge?
- What does research show is the most effective way for students to learn about occupational safety and health?
- Occupational Safety & Health Knowledge Survey of Incoming University Students.

(2) *Title:* **Attitude of Employers and Older Nurses to Prolonged Working Life in the Nursing Profession in Western Australia**

*Progress to date:*

This study was conducted in 2 stages. The first stage employed a previously developed and tested measure to assess the degree of discriminatory attitudes and stereotypical views held by hiring decision makers (163 nursing recruiters) towards older nurses (aged 50-70 years) in Western Australia. This information was compared to research previously conducted within other industries in Australia. The results when statistically analyzed showed that overall nursing recruiters hold more negative attitudes towards older workers than do other employers to older workers. The second stage of the research comprised of a qualitative investigation of the attitude of older nurses towards their current work positions and their views on working beyond retirement age (60 for women, 65 for men). Semi-structured interviews were conducted with a sample of 17 older nurses. These interviews identified 5 main themes for further research. Following on from this investigation a unique quantitative instrument was developed, which was initially piloted and refined (with a sample of 105 older nurses). Once refined the instrument was then used to conduct research with a sample of 600 older nurses registered with the Nurses and Midwives Board of Western Australia. When the results were analyzed 5 factors were identified. (1) These nurses were satisfied with nursing as a profession. (2) these nurses were less than satisfied with their dealings with management. (3) They were dissatisfied with being overworked. (4) They perceived a lack of fairness in their treatment at work. (5) In relation to job sentiment many of these nurses were thinking of leaving the profession, often because they would like to reduce their workload ('burnout') or because they felt unsupported or undervalued in their workplace.

*Next Steps:*

Write articles for publication about the findings of this research. Further this investigation and survey a large representative nation-wide sample of older nurses. The findings of this survey would be valuable for informing policies and best practice in the health sector in relation to older nurses. The next goal for the researchers after conducting an Australia wide survey is to look to address the area of older nurses internationally.

Proposed article titles:

- The qualitative study into mature aged nurses perspectives on prolonged employment
- Nurse recruiters' attitude towards mature age nurses
- The development of the quantitative measures for a study on mature aged nurses perspective on prolonged employment
- Attitude of employers and older nurses to prolonged working life in the nursing profession in Western Australia

(3) *Title:* **Occupational Respiratory Health Surveillance at Murin Murrin Mine Site**

*Progress to date:*

Quantitative research data collected.

*Nest Steps:*

Research data to be analyzed and research report written.

(4) *Title:* **Cover violence in nursing - A Western Australian experience**

*Progress to date:*

Qualitative research data collected from 50 research participants. Research data being analyzed.

*Next Step:*

Research report to be written.

(5) *Title:* **Challenges and Opportunities for the Occupational Safety and Health of Women who Work in the Transport Industry**

*Progress to date:*

Research conducted and report written. Major occupational safety and health problems identified for women who work in the transport industry were physical stress, credibility and competence, security, personal needs (which included lack of information, food, toilets and showers), payment for work, rehabilitation and compensation. Findings have been presented at 3 conferences and 2 seminars. Have had 2 articles published in refereed journals on different aspects of the findings of this research.

(6) *Title:* **Nurse Managers - A guide to occupational safety and health practice**

*Progress to date:*

Research information collected

*Next Step:*

A book is to be written on the research findings

(7) *Title:* **Career Planning and Education for Safety Professionals**

*Progress to date:*

Research conducted and report written. Replies from 137 respondents who work in occupational safety and health identified and the most common motivator to learn about occupational safety and health was found to be

a desire to improve occupational safety and health. The most popular reasons for choosing a career as a Safety Professional were because the respondent enjoyed doing occupational safety and health work and felt that their work made a difference. The most important skill identified as necessary to work as an effective safety professional was good communication. The most reported area of expertise required was management skills educational opportunities for developing skills were found to be available through short courses run by private enterprises, Technical and Further Education (TAFE) and through university courses of study that ranged from Bachelor Degree to PhD level.

Research findings presented at a conference
Research findings published in a refereed journal

*Next Steps:*
Plan to continue on to expand this research and look at what skills are required to work as an effective occupational safety professional from the employer's point of view. Have collected over one hundred 2008 + 2009 published occupational safety and health employment position advertisements to analyze the skills that are published as required by employers for occupational safety and health employment positions. Will look at writing an article for consideration of publication on the results of this further research.

(8) *Title:* **Investigating the excretion pattern of diesel exhaust metabolites in urine to quantify workplace diesel engine exhaust exposure**

*Progress to date:*
Urine samples collected for analysis from research participants. Questionnaire pilot survey conducted.

*Next Step:*
Research data collect is to be analyzed

Student research being conducted
(9) **Development of a novel model for assessing diesel exhaust exposure and cancer risk (Phase II)** (Part of the research project "Investigating the excretion pattern of diesel exhaust metabolites in urine to quantify workplace diesel engine exhaust exposure.")

(10) **Pre-claim prevention of long duration claims in workers compensation claims**

(11) **A study of benchmarking accident prevention strategies between the coal mining industry in China and the Western Australian mining industry**

(12) **Evaluating the effectiveness of traditional classroom, 2D multimedia and 3D virtual reality serious games delivery methods for oil and gas industry emergency response training**

(13) **International transportability of occupational safety & health credentials**
(This research is an extension of the research project Career Planning and Education for Safety Professionals).

Marketing Activities
At the last World Safety Organization Conference in 2008 it was identified that there was a need for World Safety Organization Collaborating Centers. In Australia such a Center has been established. Please see the following report that has been written by Professor Peter Leggat, a second World Safety Organization Collaboration Center is being established at the Newcastle University in New South wales under the Directorship of Professor Derek Smith.

World Safety Journal
The World Safety Journal has been well supported by the Safety Professionals and university students in Australia. The following articles have been published in the World Safety Journal by Australian Safety Professionals and occupational safety and health students.

- Damien Agostinelli. The value of occupational safety and health
- Kana Enomoto. How can an organization enhance its safety culture?
- Janis Jansz. Skills required for, and education available for, Safety Advisors
- Janis Jansz. The impact of ergonomic factors on women transport workers
- Janis Jansz. Promoting business profits and sustainability in industries in China by improving occupational and environmental health through the use of cleaner production, industrial ecology, health promotion and new media
- Peter Leggat. Proceedings of WSO Global Safety Roundtable X 2008
- Milos Nedved. Accident investigation and frequently occurring deficiencies
- Derek Smith and Ken Takahashi of Japan. International occupational safety and health. The development of English-language occupational health and safety journals in Japan

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# Collaborating Center

**Anton Breinl Center, James Cook University, Townsville Australia**
Director: Prof. Peter A. Leggat; Annual Report to the WSO Board of Directors 2009

**Introduction "First WSO Collaborating Centers Designated in Australia"**
The first WSO Collaborating Centers (CC) have been designated in Australia. The Anton Breinl Center for Public Health and Tropical Medicine, James Cook University, has the honor of becoming a Foundation WSO CC. It has been designated in the areas of Disaster Health and Emergency Response, Injury Prevention and Occupational Health, and Travel Safety and Health. The WSO CC was initially designated on October 6, 2008, in the first two nodes and the extension to include Travel Safety and Health node was granted on January 22, 2009. The Anton Breinl Center can trace its history back nearly 100 years to the establishment of the original Australian Institute of Tropical Medicine founded in 1910 and was Australia's first medical research institute. The WSO CCs join a host of illustrious WHO and ILO CCs already operating in Australia, some in areas directly related to safety, as well as the WSO International Office for Australia.

The Foundation Director of the new WSO CC is Professor Peter Leggat, MD, PhD, DrPH. Professor Leggat is Head of the School of Public Health, Tropical Medicine and Rehabilitation Sciences at James Cook University in Townsville, Australia. He holds the WSO-CSE/CSM/CSS(OSH)/CSSD certifications as well as being a Certified Medical Review Officer (MRO) from the US MRO Certification Council. Recent research at the Center has focused on areas such as review of disaster medical assistance teams, audits of aeromedical retrieval, assessment of the occupational health problems of health care workers, and the epidemiology of alcohol, tobacco and other drugs (ATODs) in the workplace. One measure of productivity is peer-reviewed publications and presentations. A list of peer-reviewed publications and presentations in our areas of designation is available at Appendices 1 and 2 respectively.

**Senior Management Team** (*External members)
Professor Peter Leggat, MD, PhD, DrPH, FAFPHM, WSO-CSE/CSM/CSS/CSSD, Director
Associate Professor Peter Aitken, MBBS,

EMDM, FACEM, Snr Specialist, Emergency Medicine
Professor Rick Speare, BVSc, MBBS, PhD, FAFPHM, FACTM, MRCVS, Head of Discipline
Lawrence Brown, MPH, Senior Principal Research Officer
Professor Derek R. Smith, PhD, DrMedSc, FSIA, FACTM, FRSPH, CPE, Adjunct Professor*
Associate Professor Marc Shaw, BMedSc, MBBS, DrPH, FRNZCGP, Adjunct Associate Professor*
LtCol Jon Hodges, MBBS, MHA, DipOccMed, FRACMA, FACTM, Adjunct Assoc. Professor*

**Terms of Reference**

The WSO CC was established with nominated "Terms of Reference", which are listed at the WSO Website under WSO CC at: URL. http://www.worldsafety.org/pages/coll-centers.html (accessed June 28, 2009)

The terms of reference for the WSO Collaborating Center in Disaster Health and Emergency Response are:

- To provide leadership, training and education necessary for effective disaster health and emergency response;
- To provide expertise in the epidemiology of disasters in the Asia-Pacific Region;
- To act as a repository for the collection, collation and dissemination of information in disaster health and emergency response;
- To aid in the design and delivery of country-specific disaster health and emergency response strategies and programs; and
- To support ongoing research and development in disaster health and emergency response.

The terms of reference for the WSO Collaborating Center in Injury Prevention and Occupational Health are:

- To provide leadership, training and education necessary for effective injury prevention and occupational health;
- To provide expertise in the epidemiology of injury prevention and occupational health in the Asian-Pacific Region;
- To act as a repository for the collection, collation and dissemination of information;
- To aid in the design and delivery of country-specific injury prevention and occupational health strategies and programs; and
- To support ongoing research and development in injury prevention and occupational health.

The terms of reference for the WSO Collaborating Center in travel Safety and Health are:

- To provide leadership, training and education necessary for effective Travel Safety and Health;
- To provide expertise in the epidemiology of Travel Safety and Health in the Asia-Pacific Region;
- To act as a repository for the collection, collation and dissemination of information;
- To aid in the design and delivery of country-specific Travel Safety and Health strategies and programs; and
- To support ongoing research and development in Travel Safety and Health

**External Representation**

Members of the WSO CC are active nationally and internationally in representing the Center. Recent examples of this representation or consultancy include:

*International*
Archives of Environmental and Occupational Health (Editorial Board)
Industrial Health (Editorial Board)
Journal of Travel Medicine (Editorial Board)
Travel Medicine and Infectious Disease (Editorial Board)
World Safety Organization

*National*
National Health and Medical Research Council
Australasian Faculty of Travel Medicine
Australian Travel Health Advisory Group
Annals of the ACTM (Editorial Board)
Journal of Military and Veteran's Health (Editorial Board)
Journal of Occupational Health and Safety-Australia and New Zealand
Department of Defense
Therapeutic Goods Authority
National Collaborative for Disaster Health Education

*State*
Queensland Injury Prevention Council
Queensland Emergency Medicine Research Foundation
WorkCover New South Wales

**Future Activities**

The WSO CC is reviewing its Directorship arrangements for the various nodes, i.e.

- It is proposed to assign Directorship of Disaster Health and Emergency Response node of the WSO CC to Lawrence Brown, MPH, who is currently Senior Principal Research Officer in the Anton Breinl Center
- Professor Leggat will retain Directorship of the other two nodes of the WSO CC at this time, i.e. Injury Prevention and Occupational Health and Travel Safety and Health
- Separate offices have been secured for the Injury Prevention and Occupational Health node of the WSO CC and the WSO CC will be submitting a tender to the Queensland Government's Queensland Injury Prevention Council to advertise and appoint and dedicated Director of this node.

The WSO CC is presently assisting two of our Adjunct appointments in establishing further WSO CC in Australia and New Zealand:

- Professor Derek Smith, Director, WorkCover New South Wales Research Center of Excellence, University of Newcastle, Australia, is currently compiling an application to extend the Australasian Network of WSO CC to include his Center as a WSO CC in Occupational Health.
- Associate Professor Marc Shaw, Medical Director, WorldWise New Zealand, is currently compiling an application to extend the Australasian Network of the WSO CC to include his center, as a WSO CC in Travelers' Health, Safety and Security.

In addition to launching a WSO CC Website linked to the JCU site in the next few months, the Director of the WSO CC looks forward to the opportunity of networking with similarly designated groups from the WSO and with CCs from other international organizations. In addition, the work of this WSO CC contributes directly to the work of the WSO International Office for Australia.

**Appendix 1. Peer Reviewed Publications in 2008-2009** (WSO CC Staff/Adjuncts in Bold)

2009

1. **Shaw MTM**, O'Brien B, **Leggat PA.** Rabies post-exposure management of travelers presenting to travel health clinics in Auckland and Hamilton, New Zealand. *Journal of Travel Medicine*. 2009; 16: 13-17
2. **Leggat PA, Smith DR, Speare R**. Hand dermatitis among veterinarians from Queensland, Australia. *Contact Dermatitis*. 2009; 60: 336-338.
3. **Smith DR, Leggat PA, Spear R.** Musculoskeletal Disorders and psychosocial risk factors among veterinarians in Queensland, Australia. *Australian Veterinary Journal*. 2009; 87: 260-265.
4. **Leggat PA,** Kedjarune U. Dental Health, 'dental tourism' and travelers. *Travel Medicine and Infectious Disease*. 2009; 7: 123-124.
5. **Leggat PA, Smith DR.** Alcohol-Related Absenteeism: The need to analyze Consumption Patterns in Order to Target Screening and Brief Interventions in the Workplace. *Industrial Health*. 2009; 47: 345-347.
6. **Leggat PA.** Malaria, mefloquine and diving. *Annals of the ACTM* 2009; 10:32.

7. **Smith DR, Leggat PA.** Estimation of some missing bibliographic indicators at Industrial Health. *Industrial Health.* 2009; 47: 202-203.
8. **Leggat PA, Shaw MTM,** O'Brien B. Response to Letter: There is a need for regularly updated information on rabies immunoglobulin availability in rabies endemic countries. *Journal of Travel Medicine.* 2009; 16; 227.
9. **Smith DR, Leggat PA,** Walsh LJ. Workplace Hazards among Australian Dental Students. *Australian Dental Journal.* 2009; 54: 186-188.

2008

10. **Leggat PA, Smith DR,** Clark M. Prevalence and correlates of low back pain among Australian occupational therapy students. *Canadian Journal of Occupational Therapy.* 2008; 75: 35-41.
11. **Shaw MTM, Leggat PA.** Illness and injury to travelers on a premium expedition to Iceland. *Travel Medicine and Infectious Disease.* 2008; 6: 148-151.
12. **Shaw MTM, Leggat PA.** Illness and injury to travelers on a premium expedition along the Silk Route. *Travel Medicine and Infectious Disease.* 2008; 6: 292-295.
13. **Leggat PA.** Trends in antimalarial prescriptions in Australia 2002-2005. *Journal of Travel Medicine,* 2008; 15: 302-306.
14. **Smith DR, Leggat PA.** Australian tobacco smoking rates by occupation: Results from three national surveys conducted between 1989-2001. *Archives of Public Health.* 2008; 66: 125-136.
15. **Smith DR, Leggat PA.** The historical decline of tobacco smoking among Australian Physicians: 1964-1997. *Tobacco Induced Diseases.* 2008; 4: 13.
16. Hauquitz A, **Leggat PA.** Half-time for the Millennium Development Goals: Time for travel medicine to enter the field. *Travel Medicine and Infectious Disease.* 2008; 6: 1-3.
17. **Smith DR, Leggat PA.** Impact factors and the *Journal of Travel Medicine. Journal of Travel Medicine.* 2008; 15: 389-390.
18. **Leggat PA.** Proceedings of Global Safety Roundtable X 2008. *World Safety Journal.* 2008; 17(1); 17-19.
19. **Leggat PA, Shaw MTM,** Borwein S. Response to Letter to the Editor: Traveling to China for the Beijing 2008 Olympic and Paralympic Games. *Travel Medicine and Infectious Disease.* 2008; 6: 161.

**Appendix 2. Conference Papers** (WSO CC Staff/Adjuncts in Bold)

2009

1. **Fitzgerald GJ, Aitken P, Arbon P,** Archer F. Cooper D, **Leggat P, Myers C, Robertson A,** Tarrant M, Davis E. An Australian Framework for Disaster Health Education. 16th World Congress on Disaster and Emergency Medicine. Victoria, Canada, 12-15 May, 2009.
2. **Leggat PA.** Symposium Presentation: Safety Security and Injury Prevention: Safety and Security. 11th Conference of the International Society of Travel Medicine. Budapest, Hungary, 24-28 May 2009. SY10.03: 58 (Invited).
3. **Leggat PA,** Wilks J. Overseas visitor deaths in Australia 2001-2003. 11th Conference of the International Society of Travel Medicine. Budapest Hungary, 24-28 May 2009. PO14.02:167.
4. **Shaw MTM,** Daniels D, **Leggat PA.** Illness and injury to travelers and access to dental care on a research expedition to Mongolia. 11th Conference of the International Society of Travel Medicine. Budapest, Hungary, 24-28 May 2009. PO12.01:162.
5. Zwar N, **Hudson B, Leggat PA,** for THAG. Travel Health Advisory Group: activities of a joint travel industry and travel medicine group promoting healthy travel. 11th Conference of the International Society of Travel Medicine. Budapest, Hungary, 24-28 May 2009. PO10.26: 155.
6. **Leggat PA.** Travel medicine: Informing practice through policy, research and training. Australasian Faculty of Occupational and Environmental Medicine, Royal Australasian College of Physicians Week 2009, 17-20 May 2009: 146. (Invited)
7. **Leggat PA, Smith DR, Speare R.** Hand dermatitis among veterinarians from Queensland, Australia. Capricornia Medical Science Association Conference 2009, Yeppoon, Australia, 5-8 June 2009: 46. (ISSN 1324-7352)
8. **Leggat PA.** Trends in antimalarial prescriptions in Australia 1992-2006. Capricornia Medical Science Association Conference 2009, Yeppoon, Australia, 5-8 June 2009: 30. (ISN 1324-7352) (Invited)
9. **Leggat PA.** Evolution of dengue as a public health concern in northern Queensland, Australia. Capricornia Medical Science Association Conference 2009, Yeppoon, Australia, 5-8 June 2009: 41. (ISSN 1324-7352) (Invited)
10. **Shaw MTM, Leggat PA.** Illness and injury to travelers on a premium seniors' tour to Indochina. Capricornia Medical Science Association Conference 2009, Yeppoon, Australia, 5-8 June 2009: 47. (ISSN 1324-7352)

2008

11. **Leggat PA.** Regional training in tropical and travel medicine. Asia Pacific International Conference on Travel Medicine, Melbourne, Australia, 24-27 February 2008. SYM3: 37. (Invited)
12. **Leggat PA.** Trends in antimalarial prescriptions in Australia 2002-2005. Asia Pacific International Conference on travel Medicine, Melbourne, Australia, 24-27 February 2008. PO5:61.
13. **Leggat PA,** Klein M. Australasian Faculty of Travel Medicine: activities of a professional organization promoting healthy travel. Asia Pacific International Conference on Travel Medicine, Melbourne, Australia, 24-27 February 2008. PO8: 62.
14. Zwar N, **Hudson B, Leggat PA,** for THAG. Travel Health Advisory Group: activities of a joint travel industry and travel medicine group promoting healthy travel. Asia Pacific International Conference on travel Medicine, Melbourne, Australia, 24-27 February 2008. PO12:63.
15. **Smith DR, Leggat PA.** Smoking by occupation: Tobacco control interventions and public health policy also needs to target the workplace. 20th Oxford Round Table. Oxford, UK. March 2008 (Invited)
16. **Leggat PA, Smith DR.** Alcohol consumption by occupation: Public health policy needs to target alcohol screening and brief interventions in the workplace. 20th Oxford Round Table. Oxford, UK. March 2008 (Invited)
17. **Leggat PA.** Travel insurance and emergency assistance. 6th European Conference on Travel Medicine. Rome, Italy. April 2008: 45. (Invited)
18. **Leggat PA.** Safe and secure travel into the future. 6th European Conference on Travel Medicine. Rome, Italy. April 2008: 46. (Invited)
19. **Leggat PA.** Preparing medical personnel for expeditions. 6th European Conference on Travel Medicine. Rome, Italy. April 2008: 19 (Invited)
20. **Leggat PA.** The assessment of illness whilst on expedition. 6th European Conference on Travel Medicine. Rome, Italy. April 2008. (Invited)
21. **Shaw MTM,** Leggat PA. Illness and injury to travelers on a premium expedition to Iceland. 6th European Conference on travel Medicine. Rome, Italy. April 2008: 16.
22. **Shaw MTM, Leggat PA.** Illness and

injury to travelers on a research expedition to Mongolia. 6th European Conference on Travel Medicine. Rome, Italy. April 2008: 67.

23. **Leggat PA,** Hudson B, Zwar N, for THAG. Travel Health Advisory Group: activities of a joint travel industry and travel medicine group promoting healthy travel. 6th European Conference on travel Medicine. Rome, Italy. April 2008: 68.
24. **Leggat PA.** Safety and security issues of travelers in the 21st Century. 21st International Environmental Occupational Safety nd Health Professional Development Conference of the World Safety Organization, Las Vegas, USA. June 2008: 11
25. **Leggat PA, Aitken PA.** National Survey of Disaster Medical Assistance Team Members in Australia: Implications for Preparation of Teams. 21st International Environmental Occupational Safety and Health Professional Development Conference of the World Safety Organization, Las Vegas USA. June 2008: 12-13.
26. **Leggat PA.** Safety and security issues of travelers in the 21st Century DeciCentennial Lecture Seminar Series, WorldWise New Zealand, August 2008. (Invited)
27. **Leggat PA.** Travel insurance and emergency assistance. DeciCentennial Lecture Seminar Series, WorldWise New Zealand, August 2008 (Invited)
28. **Smith DR, Leggat PA.** Tobacco smoking and occupation in Australia: Towards more effective targeting of Tobacco control interventions in the workplace. The Safety Show, Sydney, October 2008.
29. **Leggat PA.** How to give the best advice to travelers: the informatics of travelers' health WorldWise Postgraduate Seminars (DeciCentennial Lecture), Auckland, New Zealand, October, 2008 (Invited)
30. **Leggat PA.** Travel insurance and emergency assistance. WorldWise Postgraduate Seminars (DeciCentennial Lecture), Auckland, New Zealand, October, 2008. (Invited)
31. **Leggat PA.** Safety and secure travel into the future. WorldWise Postgraduate Seminars (DeciCentennial Lecture), Auckland, New Zealand, October, 2008. (Invited)
32. **Leggat PA.** Flavivirus disease. WorldWise Postgraduate Seminars (DeciCentennial Lecture), Auckland, New Zealand, October, 2008. (Invited)
33. **Leggat PA.** Assessment of the post-traveler. WorldWise Postgraduate Seminars (Deci(Continual Lecture), Auckland, New Zealand, October, 2008. (Invited)
34. **Leggat PA.** 60th Sandford Jackson Lecture: Preparing for future voyages of discovery and medical challenges. Australian Medical Association, Townsville, Australia, October 2008. (Invited)
35. **Leggat PA, Aitken P, Hodge JV**, Mazur S. Keynote address: Developments in Postgraduate disaster health and aeromedical retrieval education at JCU. Kenneth James McPherson Education and Research Foundation, Queensland Ambulance Service. Brisbane, Australia, November 2008. (Invited)
36. **Smith DR, Leggat PA, Spear R.** Musculoskeletal disorders and psychosocial risk factors among veterinarians in Queensland, Australia. Abstracts from the Human Factors and Ergonomics Society of Australia National Conference, Adelaide, 17-19 November, 2008 P.84.

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# WSO International Office for Lebanon

submitted by: Dr. Elias M. Choueiri

**Awards**

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|---|---|---|
| (2nd Place) Yearly contest on Security Awareness Award | Internal Security Forces, Lebanon | 2008 |

**Professional Publications**

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|---|---|
| Lebanon | "How I, a Lebanese Christian, View Iman Mousa Es-Sadr's Approach and Intellect," Dar El Mahaja El Bayda2, Lebanon, 2008. (in print). |
| Lebanon | "Trips Towards Traffic Safety," Dar El Mahaja El Bayda2, Lebanon, 2008. (in print) |
| Lebanon | The Road to GOD is One," Dar El Mahaja El Bayda2, Lebanon, 2008. *Number of pages:* 96 (Arabic). |
| Lebanon | "Saleh and his Story with Traffic Safety," Dar El Ilm Lilmalayin, Lebanon, 2009. *Number of pages: 56* (Arabic) |
| Lebanon | Choueiri, E.M., Nashef, A., and Saade, W., "Traffic Accidents: Between Experts' Reports and Court Judgements, in Accordance with the Traffic Law," Al Ghazal Publisher, Lebanon, 2008. Numbers of Pages: 458 (Arabic) |

Articles in Books

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|---|---|
| Lebanon | "Characteristics of Monsignor Merhej", in the ***Book:*** Sagesse, the University - in their Footsteps ... After Christ, ***Chapter 2:*** Exhaling Fragrance, ***Section:*** From our Garden Publications of Sagesse University, Beirut 2008, p. 63 |

Journal Articles

| | |
|---|---|
| Lebanon | "An Investigation File on: Traffic and Accidents", Ta'miN, a bi-monthly journal specialized in the field of insurance, October/November 2008, No. 99-100,2008, pp. 64-65. |
| Lebanon | "An Investigation File On: Traffic and Accidents", Ta'miN, a bi-monthly journal specialized in the field of insurance, August/September 2008, No. 97-98, 2008, p. 71. |

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|---|---|
| USA | Choueiri, E.M., Rizek, N., Choueiri, G.M., and Choueiri, B.M., "Human-Computer Interaction: Means for improving Teaching," The Correctional Trainer, official publication of the International Association of Correctional Training Personnel (An affiliate of the American Correctional Association), U.S.A., Fall 2008, pp. 10-19. |
| Lebanon | "Following its Success in Lebanon, 3irs el-Sama in Australia", Sawt Al Mahaba, Fourth Year, Issue No. 19, August/September 2008, pp. 54-55. |
| Lebanon | "An Investigation File On: Traffic and Accidents", Ta'miN, a bi-monthly journal specialized in the field of insurance, June/July 2008, No. 95-96, 2008, P. 60. |
| USA | "WSO International Office for Lebanon Report", World Safety Journal, USA, Volume XVII, No. 2, 2008, p.6-9. |
| Lebanon | Gedeon, P., Zeitouni, E., and Choueiri, E.M., "The Student-Centered e-Learning: From Distance Education to Personal Lifelong e-Learning", Pertinence, Revue de Recherche Scientifique de l'Université Antonine, Editions de l'Université Antonine, No. 1, 2008, p 67-100. |
| Lebanon | "Our Duties as Drivers on the Road", Al-Jaish, a journal issued by the Lebanese Army Directorate of Information, No. 275, May 2008, p. 99-101. |
| Lebanon | "An Investigation File on: Traffic Problems", Ta'miN, a bi-monthly journal specialized in the field of insurance, April/May 2008, No. 93-94, 2008, P. 68 |
| Lebanon | "An Investigation File On: Traffic Problems", Ta'miN, a bi-monthly journal specialized in the field of insurance, February/March 2008, No. 91-92, 2008, p. 54-55. |
| Lebanon | "Key Factors Behind Road Accidents and Means of Avoiding Them", Al Moukawel "Lebanese Contractor), a journal issued by the Lebanese Syndicate of Public Works and Construction Contractors, Issue No. 124, February 2008, p. 46-49. |
| Lebanon | "An Investigation File On: Traffic Problems", Ta'miN, a bi-monthly journal specialized in the field of insurance, December 2007/January 2008, No. 89-90, 2008, p. 58-59. |
| USA | Choueiri, E.M., Rizek, N., Choueiri, B.M., and Choueiri, G.M., "The Use of E-mail as a Qualitative Research Tool in Higher Education and Correctional Settings," The Correctional Trainer, official publication of the International Association of Correctional Training Personnel (An affiliate of the American Correctional Association), U.S.A., Winter 2008, p. 1-27. |

Conference Papers

| | |
|---|---|
| Jordan | Gedeon, P., and Choueiri, E.M., "Technical and Educational Aspects of Distance Education," Proceedings of the International Conference on Interactive Mobile and Computer Aided Learning, IMCL 2009 (Sponsored by PSUT,...), Amman, Jordan, 22-24 April 2009, p. 165-174 |
| Jordan | Rizek, N., and Choueiri, E.M., "Making Use of Information on the Web to Enhance Teaching," Proceedings of the International Conference on Interactive Mobile and Computer Aided Learning, IMCL 2009 (Sponsored by PSUT,...), Amman, Jordan, 22-24 April 2009, p. 175-181. |
| USA | Choueiri, E.M., Choueiri, G.M., and Choueiri, B.M., "The Social Impact of Road Traffic Accidents: The Case of Lebanon", Proceedings of the 21st International Environmental and Occupational Safety Health Professional Development Conference, World Safety Organization, Las Vegas, Nevada, USA, 9-11 June 2008, p. 2-9. |
| Jordan | Rizek, N., and Choueiri, E.M., "A Common Tool for Qualitative Research in Higher Education: The e-mail," Proceedings of the International Conference on Interactive Mobile and Computer Aided Learging, IMCL 2008 (Sponsored by PSUT, IEEF, Siemens, ...), Amman, Jordan, 16-18 April 2008, 11 pages. |

Newspaper Articles

| | |
|---|---|
| Lebanon | "To the Minister of Interior and Municipalities?", An-Nahar Newspaper, Saturday, May 9, 2009, p. 8 |
| Lebanon | "Read...for, in the Beginning was the Word", Al-Liwaa Newspaper, Tuesday, May 5, 2009, p. 19 |
| Lebanon | "During the Period of Resurrection, Only Prayers are Key to Salvation?", An-Nahar Newspaper, Saturday, April 18, 2009, p. 8 |
| Lebanon | "Why...All These Questions?", An-Nahar Newspaper, Thursday, April 9, 2009, p. 8 |
| Lebanon | "Hold...Still!", An-Nahar Newspaper, Thursday, March 12, 2009, p. 8 |
| Lebanon | "Between Yesterday and Today!", An-Nahar Newspaper, Saturday, January 31, 2009, p. 8 |

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|---|---|
| Lebanon | "Traffic Priority and Murder Crimes", An-Nahar Newspaper, Thursday, January 29, 2009, p. 7 |
| Lebanon | "Safe Driving and Text Messages (SMS)", An-Nahar Newspaper, Tuesday, January 13, 2009, p. 5 |

Television Appearances

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|---|---|
| Lebanese TV | "Enforcing Traffic Rules and Regulations", Problems and Solutions, September 13, 2008 |

Radio Appearances

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|---|---|
| Lebanese Broadcasting (Ministry of Information), Lebanon | "Traffic Law Enforcement", September 4, 2008 |
| Lebanese Broadcasting (Ministry of Information), Lebanon | "Summer Safety", July 10, 2008 |
| Lebanese Broadcasting (Ministry of Information), Lebanon | "Motorcycle Riders", May 20, 2008 |
| Lebanese Broadcasting (Ministry of Information), Lebanon | "Taxis and Vans", March 8, 2008 |

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# WSO International Office for Malaysia

submitted by: Dr. Fernando Colin James

We have taught 59 courses, of these courses 50 were taught by Dr. Fernando. In these courses he has had 998 participants. Nine courses were conducted by qualified lectures certified by the World Safety Organization.

Safety & Health Audits

The International Office has conducted two Safety & Health Audits for SapuraAcergy 3000 in Singapore and this Dynamically Positioned Vessel is owned by (SapuraAcergy Sdn Bhd) based in Kuala Lumpur, Malaysia on 05-06th December 2007.

The aim of this audit was to determine the level of Safety & Health Standards were adopted by the vessel. On the basis of the audits, the company was rated "average" as compared to other vessels with similar work activities in Malaysia. This audit was undertaken by the undersigned over a period of two days.

Safety & Health Publication

On the basis of the Safety & Health Audits, it was noted that Sejingkat Power Corporation Sdn Bhd need to design and promulgate a Safety Handbook. The aim of this Safety Handbook was to familiarize direct employees and employees of sub-contractors the basic Safety & Health requirements currently adopted and enforced by the company.

All employees and employees of sub-contractors were issued a copy of the Safety Handbook after attending a Safety orientation briefing conducted jointly by the company's Safety & Health Officer and the undersigned on 17th October, 2007.

Emergency Response Plan - ERP

The WSO International Office for Malaysia has promulgated and tested the Emergency Response Plan for Sejingkat Power Corporation on 21st August 2007. The need for an Emergency Response Plan was based on the findings of the Safety & Health Audit as there were 3 major 'High' risk hazards within the plant. e.g. Hydrogen Plant, Coal Bunker Yard Area, and the Chemical Plant.

The aim of the ERP was to put in place a system whereby a team of trained Fire Fighters, Rescuers and First Aiders could take immediate actions to combat and contain any incipient fires and explosions within the plant before the arrival of the government Fire & Rescue Services as the location of the plant was remote and the time taken for any of the emergency services getting to the plant was about 2 hours or more.

The International Office for Malaysia, sincerely hopes that through proper networking with the other International Offices these programs can be effective conducted in Malaysia, Indonesia and Brunei with Minimum costs.

Thanks and Appreciation

On behalf of the WSO International Office for Malaysia and myself, I would like to record my sincere thanks to two most distinguished personality Ms. Debbie Burgess and Ms. Janet Barnes for the tremendous support, encouragement and guidance rendered to the National Office and of course the efficient manning of the World Management Center.

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# WSO International Office for the Philippines

submitted by: Eng. Alfredo A. De La Rosa Jr. WSO-CSE

**Training and Education Activities:**

One of the most important mandate of the World Safety Organization-International office for the Philippines, as a duly accredited Safety and Health Training Organization (STO) by the Bureau of Working Condition, Department of Labor and employment, Republic of the Philippines is to be a partner of the government in promoting safety and health and to increase the number of competent safety practitioners in the Philippines.

Over the last three years there have been several training programs and seminars developed and conducted by the training and technical staff of the World Safety Organization International Office for the Philippines.

In the annual report submitted to the Bureau of Working Conditions, Department of Labor and Employment, Philippines of 2008. The WSO has made a tremendous growth and emerged as the most active partner of the government among it's peers.

- January - December 2008
- 37 Basic Occupational Safety and Health

Course (40 hours)
- 5 Construction Safety and Health Course (40 hours)
- 5 Loss Control Management Course (40 hours)
- 447 Health, Safety & Environment Related Courses
- 494 Total training/seminar conducted, trained 14,356 individuals from 2,149 companies

Due to the increasing needs for quality and affordable safety training, in August of 2005, the World Safety Organization-International Office for the Philippines started to set-up regional training and safety advocacy centers in the Philippines and the first one is the WSO Region IV Center located at Governors Drive, General Trias, Cavite. The center now serves the safety, health and environmental training requirements of the neighboring industrial zones.

In August of 2007, WSO opened its regional center in Cebu, which is located at the 3rd Floor, NDI Commercial Complex, A.S. Fortuna Street, Mandaue City, Cebu. The center now serves the training requirements of industrial organizations located at Mactan Export Processing Zone and the neighboring islands of Bohol, Dumaguete, Negros and in Cagayan De Oro City and Davao City in Mindanao.

In May of 2008, the WSO International Office for the Philippines (Main Office) has moved to a new location at the 2nd Floor, Unit 204, Xanland Place Building, 323 Katipunan Avenue, Zuezon City, Philippines. The WSO Offices is now situated along the university strip, Loyala Heights at the heart of Quezon City. The Ateneo De Manila University and Merriam College Campuses are just right across the WSO Offices. The University of the Philippines is just 3 minutes away.

**Advocacy in Safety, Health and Environmental; and in "Making Safety a Way of Life...Worldwide"**

The WSO's involvement in several advocacy campaigns in the promotion of safety and accident prevention, disaster and emergency preparedness and in the promotion of "Making Safety of Life...Worldwide" in collaboration with local community organizations, safety organizations, school organizations, the government and media organizations throughout the Philippines.

The World Safety Organization-International Office for Philippines have supported the activities of other partner safety organizations either as host, sponsor, co-sponsor, presenter, exhibitor, advertiser, etc. to name a few:

Safety Organization of the Philippines, Inc. (SOPI)
- 38th National Industrial Safety Convention - October 26-28, 2005, Subic, Philippines
- 39th National Industrial Safety Convention - November 8-10, 2006, Cebu, Philippines
- 40th National Industrial Safety Convention - October 17-19, 2007, Baguio, Philippines
- 41st National Industrial Safety Convention - November 5-7, 2008, Quezon City
- 1st Construction Industrial Safety Convention - April 29-30, 2009, Zuezon City

Association of Safety Practitioners of the Philippines, Inc. (ASPPI)
- Safety Code of Practice...Symposium - July 30, 2004, Quezon City, Philippines
- SHE Values...for Life Symposium - September 30, 2005, Quezon City, Philippines
- Revitalizing OHS Practices Convention - August 27-18, 2006, Manila, Philippines
- Promoting Workplace Safety Convention - August 24-25, 2007, Quezon City, Philippines
- Managing Risks in the Construction Industry - June 13, 2008, Quezon City, Philippines
- Managing Risks in the Workplace - August 28-19, 2008, Cebu City, Philippines
- Sustaining OSH in Industry Symposium - December 10, 2008, Quezon City, Philippines

In the KAPATIRAN WISE-TAV ADVOCACY PROJECT (Big Brother and Small Brother) of the Department of Labor and Employment, the World Safety Organization was awarded with a Certificate of Appreciation for supporting and contributing to the project as training provider (free-of-charge) for the Basic Occupational Safety and Health Course (40 hours) conducted on May 4-9, 2009 in Lucena City, Philippines.

Another Certificate of Appreciation was awarded to the World Safety Organization for providing resource speakers for the Basic Occupational Safety and Health Training conducted for the Department of Labor and Employment Regional Offices technical staff.

The Philippine National Red Cross (PNRC) has also presented an award of appreciation to the World Safety Organization for its recognition of the outstanding and continuous support for safety services training for Red Cross Volunteers. The awarding was held during the Philippine National Red Cross Convention of December 12, 2008 at Cavite City, Philippines

**WSO International Membership Generation**

The training and educational activities of World Safety Organization-International Office for Philippines over the years have made the World Safety Organization in the Philippines more credible and the needs for international affiliations by Filipino safety professionals who are in the field of construction, oil and gas and manufacturing are increasing. It is now evident that the membership interest to World Safety Organization is moderately growing.

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# WSO International Office for Poland

submitted by: Central Institute for Labor Protection - National Research Institute

**The Institute's profile:**

The institute is a research institution whose main activity aims at working out new technical and organizational solutions in the field of occupational safety and health (OSH), ergonomics and the working environment. In particular, CIOP-PIB's activities in the field of OSH include: research and development; determination of exposure limits; standardization taking into account the requirement of European and international standards; testing and certification of machinery and manufacturing devices as well as personal and collective protective equipment; implementation and certification of OSH management systems; certification of the competence of personnel and educational bodies active in OSH; education and training, consultations, promotion, information and publishing activity.

The Institute is also involved in foresight activities aimed at identification and assessment of future needs, opportunities and risks connected with social and economic development as well as preparation of appropriate anticipating measures.

**Scientific research:**

Scientific research, the Institute's principal activity, concerns the following main areas of OSH: chemical and aerosol hazards; noise, vibration and electromagnetic hazards;

occupational risk assessment and occupational safety management, safety engineering, methods for testing and advancement of personal protective equipment (PPE), and adaptation of workplaces to human psycho-physical capabilities.

In 2008 the Institute carried out 257 projects within the national program *"Improvement of safety and working conditions"* and within its statutory activity.

2008 was the first year of implementing a **new National Program "Improvement of safety and working conditions"**, established by the Resolution No. 117/2007 of the Council of Ministers of 3 July 2007. Phase 1 of the Program is carried out in the years 2008-2010.

The Program was proposed and is supervised by the Minister of Labor and Social Policy. The Minister of Science and Higher Education cooperated with CIOP-PIB, the main program performer, in the area of research and development works.

The strategic objective of the Program is developing and implementing innovative organizational and technical solutions, focused on the improvement of human resources, new products, technical solutions, focused on the improvement of human resources, new products, technologies, management methods and systems, aimed at significant reduction of occupational accidents and diseases in Poland as well as related economic and social losses.

The Program is composed of two parts:
- Part A: program of tasks related to services for the State (supervised by the Minister of Labor and Social Policy) - 136 tasks in 8 thematic groups (in 2008 - 126 tasks);
- Part B: program of Research and development projects (supervised by the Minister of Science and Higher Education) - 72 research projects in 5 groups (in 2008 - 61 projects).

**Other types of activities** (relevant to WSO objectives)
- Educational activity
  CIOP-PIB is the major provider of training and education in OSH in Poland. Its educational and training activity is implemented by the center for educational established within the Institute's structure in 1994. The Program Council composed of scientists and practitioners, including social partners, supervise the activities of the Center.

The Center offers the following forms of education:
- postgraduate studies Safety and protection of man in the working environment
- refresher training for employers, managers, OSH services personnel, office and administration staff,
- specialist training on various OSH-related topics

The number of persons participating in different forms of education in 2008: 2002 persons, including:
- Post-graduate studies: 192 students (including 674 participants of Internet-based studies)
- Other courses: 1810 participants.

- Certification of personnel's competence
  CIOP-PIB is the only scientific body in Poland that is accredited to certify competence of personnel, whose activities significantly influence the shaping of safe working environment and occupational health and safety education level. The Center for Certification of Personnel's Competence, established within the structure of the Institute, is entitled to grant competence certificates to:
  - OSH lecturers,
  - OSH specialists
  - specialists in measurement of working conditions parameters
  - auditors of an OSH management system
  - consultants in systemic OSH management.

Moreover, the Center acknowledges competence of educational bodies training the above mentioned groups of specialists.

In 2008:
- 292 applications for certificates of personnel's competence of individual persons (lecturers, OSH specialists, auditors) or extension of their validity period were received
- 264 certificates were granted
- competence of 556 certificates was supervised
- competence of 13 educational units to conduct OSH training was recognized
- 16 regional OSH centers were accredited

**Information**

**– Library resources**

CIOP-PIB library is a specialist library, with an extensive collection (about 30,000) of books in the area of broad knowledge on safety and health protection of man in the working environment. The interdisciplinary nature of the subject means that the library resources cover almost all areas of science, human, technical and social sciences. There is also an extensive collection of books of a universal nature - dictionaries, encyclopedias, lexicons and guidebooks, as well as archive publications of historical significance from the 1920s, 1930s and 1940s. The subjects of archive publications include: psychology, physiology, medicine, chemistry, toxicology, occupational safety etc.

In 2008 the library had 200 titles of Polish journals, (including 102 scientific and specialist journals) as well as 85 foreign journals.

The descriptions of new books and other materials were entered to the electronic catalogue in ALEPH computer system. The works on developing and maintaining 7 library databases as well as on the electronic lending system were continued. The website of the library was broadened and new information were interred, e.g. tables of contents of most important Polish OSH journals.

**– Information services**

Information services for Polish and foreign users included a variety of forms such as: elaborating databases, answering queries on publications and many problems connected with occupational safety, health, and ergonomics; preparing the lists of Polish and foreign literature on selected subjects using the Internet databases as CISDOC, OSH-ROM, OSH-UPDATE, FIREINF, EBSCO Publishing, Proquest etc.

CIOP-PIB, as the Polish National Focal Point of the European Agency for Safety and Health at Work, continued cooperation with the national Network of Partners, which includes, following the Agency's recommendations, 36 representatives of state institutions, research institutes, employers and trade unions.

The Focal Point organized and coordinated the Polish edition of the European Information Campaign on Risk Assessment. *The Healthy Workplace. Good for you. Good for business*, since 2008 implemented in a two-year cycle. The activities of the European Campaign on Risk Assessment in 2008 included:
- A press conference opening the campaign - Warsaw, June 2008,
- Seminars and training's for enterprises and local communities, representatives of SMEs,
- Conferences for mining and construction sectors,
- Competitions:
  - European Good Practice Competition
  - Drawing competition for children
  - Photo competition
- Cooperation with mass media, press publications, interviews.

In 2008 CIOP-PIB fulfilled also the role of the **Polish National CIS Center**, being the member of the CIS/ILO network of about 155 National, Cooperative and Regional CIS Centers, located in more than 100 countries on all continents.

That year the Polish National CIS Center continued its activity aimed at taking part in the international elaborating of OSH

information sources, simultaneously using the CIS network to promote internationally Polish OSH literature and achievements as well as using the CIS international occupational safety and health information system to help Polish users to stay informed about foreign publications and data. The Polish CIS Center prepared 225 descriptions of Polish OSH literature and short texts for foreign databases, publications, website's, run information services for foreign and polish users, as preparing lists of literature on the certain subjects, finding among others the proper and latest information on occupational hazards, accidents, illnesses and the ways of protecting workers, on important documents and national and international OSH events. It broadened also its English language database OSH-BHP on Polish literature with 225 abstracts. The Polish CIS Center continued also to broaden its website with information on OSH in Poland and other countries, the latest events and links to the most important OSH institutions. It acquired and popularized OSH foreign publications, promoted nationally in an electronic and printed way the CIS network as the reliable information source and run the cooperation with this network.

**– Publications**

Publications activities of CIOP-PIB were continued, aiming at wide-scale presentation and popularization of the results of research in OSH and ergonomics, as well as crating public awareness of these issues. Publications include: monographs, guides, handbooks, conference and training materials, brochures, leaflets, CD-ROMs, computer programs, etc.

In 2008, the Institute published three journals:

- *International Journal of Occupational Safety and Ergonomics - JOSE* (in English), 3 issues,
- Podstawy I Metody Oceny Srodowiska Pracy (Principles and Methods of Assessing the Working Environment) - 4 issues
- Bezpieczenstwo Pracy. Nauka I Praktyka (Occupational Safety. Science and Practice) 12 issues

The number of citations of CIOP-PIB journals in SCI Expanded in 2008 amounted to 116.

Other publications included:

- Books
- a monograph on analysis of managerial decisions concerning implementation of OISH management
- a monograph on occupational health as safety - a compendium of knowledge on OSH
- A guide on cardiac implants in workplace EMFs
- Occupational risk assessment using the computer system STER
- a report on general physical ability and fitness occupationally active of Polish population
- a monograph on fundamentals of accident prevention
- a guide on shift work and age
- a report on social costs of accidents at work
- electrostatic hazards in explosive zones
- accident risk related to some EMF applications
- ensuring safety of machinery through control methods
- prevention of premature work inability
- application of artificial neural networks in intelligent safety systems

Still other types of publication included: conference proceedings, training materials, information and promotion materials.

**– Promotion**

Promotion activities of occupational safety, health and ergonomics knowledge in 2008 was realized in many forms, such as: seminars, workshops, trade fairs, exhibitions, competitions etc.

In 2008 CIOP-PIB continued the activity of the Safe Work Leaders' Forum, organized and based at the Institute. The Forum was created to build partnership contacts with enterprises that have implemented the achievements of science and technology in the field of designing working conditions according to the requirements of Polish and European legislation. In 2008 the Forum consisted of 93 participants, who participated in conferences, workshops and meetings organized by CIOP-PIB, and also in the realization of the national program tasks. Promotion of safe behavior at the workplace was also realized through the Network of OSH Experts certified by CIOP-PIB.

In 2008 CIOP-PIB promotion activities include, among others.

- Organization of 19 conferences and seminars in 15 different Polish towns with over 2000 participants
- Dissemination of several dozen of information and promotion materials such as brochures, leaflets, bulletins
- Promotion of OSH informational materials at International Fair of Work Protection, Fire-Fighting and Rescuing Equipment SAWO 2008 in Poznan and during "Science for Economy salon" at ITM Poland - New Europe's biggest trade show for state-of-the-art industry-related technologies,
- Organization of information campaigns "occupational risk in construction" and "Occupational risk in mining", both comprising a number of conferences, seminars and dissemination of information materials.

The Institute's promotion activity includes organization of an annual OSH Poster Competition. In 2008 the subject of the competition was "Labor culture". In 2008 CIOP-PIB organized also graphic art competitions for children, about 6,000 children took part in these competitions.

CIOP-PIB promotes its activities also via the internet. The Institute portal www.ciop.pl ranked as 3rd most popular in Europe on the subject OSH. In 2008 it was visited by around 230,000 visitors. Over 940,000 pages were browsed.

**– International cooperation**

In 2008 International cooperation of CIOP-PIB was carried out mainly within the Sixth EU Framework Program of the EU (5 projects), Sevento EU Framework Program (3 projects), projects realized under the European Community Program PROGRESS (4 Projects), projects of the European Agency for Safety and Health at work, Bilbao (3 projects) and other programs (3 projects).

The Institute international cooperation was also realized in scientific networks, e.g. PEROSH, EUROSHNET, and within the European Technology Platform "Industrial Safety" (ETPIS).

The Institute organized a number of conferences and other events, of which the most important were:

- A conference within the project of the 6th Framework Program NEW OSH ERA - New and Emerging Risks in Occupational Safety and Health. Anticipating and dealing with change in the workplace through coordination of OSH risk research (29-30 May 2008, Cracow).
- EUROSHNET - 3rd European Conference on standardization, testing and certification "Safer products for competitive workplaces" (11 - 12 September 2008, Cracow)

In 2008 more than 210 CIOP-PIB employees took part in international conferences seminars, trades and other events in foreign centers.

# WSO International Office for Taiwan

submitted by: Mr. The-Sheng Su

1200 factories received on-site technical services, and more than 9000 industrial safety and health professionals attended 120 Taiwan office's workshops and training courses. Some activities are summarized as follows.

**High-Tech Safety Services**

Process safety analysis, business continuity management, and vapor-cloud dispersion modeling were provided to strengthen the safety and health (SH) capacity of 12" semiconductor, 6G TFT-LCD, photovoltaic and LED factories. SEMI S2 certification of process tools and abatement efficiency verification of local scrubbers are also provided.

**Chemical Safety Services**

300 GHS (globally harmonized system of classification and labeling of chemicals) trainers were trained, and more than 360,000 inquiry services were provided to industry. The Taiwan office also helps regulatory agencies deal with affairs of national chemical inventory initiative, SAICM, EU REACH, and toxic chemical safety. As the launch of Taiwan GHS (end of the year 2008), The office also provided technical services to numerous multi-national chemical companies to meet the regulation.

**SH Management and Services**

The Taiwan office continues playing an important role in amendment and promotion of labor SH policies and regulations such as Taiwan Occupational Safety and Health Management Systems (TOSHMS), and a SH capacity-building project for 14,000 small business units. Taiwan office also provides other technical services to various industries, including machinery/installation safety, industrial ventilation, electrical safety, and hazard communication.

**Professional Commonwealth**

The Taiwan office actively supports numerous conferences of SH and green technology, such as those of International Occupational Hygiene Association, Taiwan Occupational Hygiene Association, Taiwan Safety Education association, etc. Thirteen college students also received the internship / scholarship of Taiwan Office to advance their SH knowledge in 2008.

The Taiwan Office will continue contributing expertise to promote SH technologies, and help customers aline with international standards, involving the care of SH societies, and serves as a technical support of public agencies.

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# The Role Everyone Plays in Contributing to Successful OHS Management in the Workplace

by: Mr. Damien Agostinelli; Bachelor of Science: Occupational Health and Safety student at Curtin University of Technology, School of Public Health. Undergraduate Health, Safety & Environment Office WestNet Energy. Email: Damien.Agostinelli@student.curtin.edu.au

**Abstract**

The role of the government, workplace managers, occupational safety and health representatives and committees in the provision of a high standard of occupational safety and health in Australia is described. The legal requirements for this involvement, successful occupational safety and health management strategies and opportunities for improvements are identified.

**Introduction**

Modern Occupational Health and Safety has evolved into a duty that every stakeholder involved in a workplace is responsible for. Stakeholders encompass any individual connected to the workplace by their duties, which includes; Government branches involved in OHS, Managers of the specific workplace, and the employees and their OHS Representatives working there. This is because each stakeholder has their own vested interest in the workplace operating without the existence of hazards and health concerns.

The Government has invested considerable resources into the improvement of OHS in Australian workplaces, in order to reduce the burden of injury and illness on society, economy, workplaces and health systems in Australia. A lot of the effects of workplace injuries drain tax payer's money on various costs including; disability pension for permanently disabled workers, regulator investigations, costs of OHS prosecutions and compensation claims (Johnstone 1997), as well as an increased drain on public health services which result from the many patients with preventable workplace injury/illness.

Management in any workplace suffer greatly from workplace injury/illness by the costs associated as well as the effects it has on employee retention and general moral in the workplace. Workplace injury/illness comes with many subsequent issues associated with it including; Lost Time Injuries (LTI's), disability, and injury compensation. These issues cost Australian businesses billions of dollars every year. During the financial year 2005-06 the cost of workers' compensation was estimated at $57.5 billion according to the Australian Safety and Compensation Council (2009). This financial figure is of direct costs which are just the tip of the iceberg when considering the broader consequences of workplace injury.

**Roles of Government**

Governments provide legislation for health and safety, and also organizations to regulate the implementation of this legislation in companies. The Australian Government provides regulator departments in every state. These assist in the management of OHS in Australian workplaces, which have different names in different states. For example in Western Australia has WorkSafe. WorkSafe takes on a number of roles in workplace OHS management. Including the development of legislation that sets out standards and minimum requirements for workplace hazards. Legislation includes Regulations, Acts, Standards which are produced by standards Australia, and Codes of Practice, as well as Guidance Notes to provide assistance in the implementation of this legislation.

Departments also regulate this legislation by inspecting workplaces to ensure conformance, and may enforce any company's legal obligations by issuing improvement and prohibition notices during the process of these inspections, as well as prosecuting serious cases of non-conformance in court. Another role that Government organizations undertake, is providing assistance to workplaces that enable them to develop safer working environments. WorkSafe WA has created a 'ThinkSafe Small Business Assistance Program' which provide small businesses with OHS consultants and other resources to assist in the development of an OHS management system (ThinkSafe Small Business Assistance Program Application Form - WorkSafe June 2007).

**Roles of Management**

The business economics associated with OHS refer to the financial advantages of applying OHS in the workplace in order to reduce injury, down time, compensation payouts, subsequent increased insurance premiums, investigation costs, poor morale, increased sick days (both morale and health related) and many more expenses that are both direct and indirect.

Leon Gettler's article in the West Australian "Health and Safety tied to stock price" in October 2007 discussed research "undertaken by corporate governance watchdog Regnan and Goldman Sachs JB Wer" (The West Australian 31 October 2007, Gettler L) conducted over a 3 year period from November 2004 to October 2007 which strongly indicated that companies that invested in good OHS outperformed in the stock market, with the great health and safety practice paying its dividends.

Management at any company are responsible for taking the leadership in ensuring the health and safety of its workplaces, and are held responsible for the safety of all employees under a 'duty of care'. A number of roles undertaken by management include; providing OHS systems, employing OHS professionals to identify hazards in the workplace and make recommendations. Which meet all necessary recommendations where practicable, and ensuring all employees have the appropriate training to safely perform their duties.

**Roles of OSH Representatives and OSH Committees**

Occupational Safety and Health (OSH) Representatives and Committees have a similar purpose. Representatives are employees nominated by their peers to volunteer additional commitment to workplace health and safety. They also represent the workforce at health, safety and environment (HSE) committee meetings, which by law requires that at least 50% of the members at these meetings are employee representatives (Establishing safety and health committees – WorkSafe 2005).

HSE committees are designed to officially raise any safety issues in the workplace under agenda items. To close out or settle an agenda item all members of the committee usually agree to a solution or action to resolve the issue raised. WorkSafe literature discusses in a bulletin the role that OHS committees play: *"A safety and health committee provides a forum for the employer and employee to meet and make decisions on improvements to safety and health in the workplace. It provides a mechanism for developing policies and procedures and for discussion of issues that have significant impact on the whole organization"* (WorkSafe 2009 – Safety and Health Representatives)

Another committee involved in the management of OHS are hazard identification (HAZID) meetings, which involve a collaboration between management and OHS Professionals to identify every hazard in a project and what controls are currently in place and can be put in place to reduce the risk of worker injury/illness. These are usually led

by a presenter and are on a large scale Job Safety Analysis [JSA], which combs through all operations and systematically creates a plan of action for the management of OHS.

WorkSafe literature also discusses the roles of Safety and Health Representatives:
"*Safety and Health Representatives are the key to communication between employers and employees... functions include:*

- *Regular inspections of the workplace (every 30 days is the minimum requirement in the Act.*
- *Immediate investigation of any accident, dangerous incident or risk of serious injury/harm to any person.*
- *Keep up to date with safety and health information.*
- *Report hazards in the work place to the employer.*
- *Consult and Cooperate with the employer on any safety and health matters.*
- *Refer any relevant matters to a safety and health committee.*
- *Liaise with employees about safety and health matters".*

(WorkSafe 2009 – Health and Safety Representatives)

This literature highlights that a representative's key role is to bridge the communication gap between management and employees. This not only plays a large part in ensuring that any safety concerns of employees are voiced, but also is the key component to developing the safety culture in a workplace. WorkSafe also underline the duties of an OHS Representative and their legal obligations, which ensure that the position does not exist for appearances only.

**Roles of Employees**

Employees have a duty to care for themselves and their co-workers. This duty of care ensures the safety of each worker and the workers around them through their actions, awareness and how they conduct themselves in the course of employment.

The value of avoiding workplace illness/injury to an employee is far greater than just the economic losses, which can be substantial. Studies have demonstrated that the value of a working environment to a worker is more than just financial. Franche & Krause (2002, p.1) discuss in the journal of occupational rehabilitation the psychological effects of not working, and the direct correlation between unemployment and depression as well as other mental illnesses. Besides a loss of income through disability, workers also suffer other effects of being unable to work, which include:

- A decreased perceived ability to perform tasks and activities.
- Increased depressive mood.
- Loss of healthy routine.
- Loss of self worth and social status.
- Sleep changes and boredom that can lead to antisocial behavior.
- Loss of fitness and health from unhealthy lifestyles.

Financially workers also feel the effects of workplace injury/illness also. Workers' compensation does not cover many aspects to finance that are affected when a worker is seriously injured or disabled. These aspects include:

- Expenditure on medical and health costs that are not covered by compensation.
- Costs of treating illnesses that stem from the initial condition/s.
- Decreased income because compensation does not cover the overtime, and bonuses a worker may normally have received.
- Gradually declining compensation if worker does not achieve a return to work program.

**Conclusion**

As outlined by this article it is everybody's responsibility to play a role in the management of OHS in the workplace. No safety systems can effectively ensure the safety of all employees without a strong safety culture that exists in all levels and stakeholders. This starts from the employees taking their duty of care for themselves and their co-workers seriously, and moves through the workplace with their representatives providing management with the issues they see at committees, right up to cooperation between companies and their regulating government bodies.

The value of occupational health and safety is significant to a number of different parties. Implementing a good system of OHS as an employer; not only benefits the financial situation of a company, but also contributes greatly to employees and society, both financially and also in other factors that increase living standards.

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# Occupational Safety and Health Management Systems: A Literature Review Exploring Best Practice

by: Mr. Ashley Lammle; Curtin University of Technology BSc (Health and Safety) Student. Email: ashley.lammle@student.curtin.edu.au

**Abstract**

For an organization to effectively manage the safety and health of its stakeholders and meet legal obligations, a system must be developed. In Australia, such a system is outlined in standards, codes of practice and guidance material to provide the ground work organizations need for meeting their 'duty of care' responsibilities. Many organizations however aim to merely meet these minimum requirements with little desire to exceed them. This article, through reviewing literature, explores the ways in which management systems can extend beyond the minimum requirements and accomplish industry best practice. It is from reviewing literature concerning OHSMS elements such as policy, planning, leadership, training, consultation, risk management, safety culture and performance monitoring that the key to achieving best practice safety management is identified. Furthermore this article critically reflects on the theories discussed, providing evidence from literature to either support or refute the conclusions derived. Finally, it is concluded that the effectiveness of an organizations health and safety management system is influenced greatly by its ability to strive for and achieve best practice regarding the elements discussed.

## Introduction

Best Practice at its simplest encompasses a process in which targets and ideals are set with the aim of discovering a more effective approach to performing tasks. Successful bench-marking involves an organization which identifies its needs and then finds other organizations or enterprises with better practices in order to learn from them. Bench-marking is an important tool in implementing best practice in occupational health and safety management. Blewett and Shaw (1997) define it as a systematic search identifying the best way of undertaking key OHS management processes. It is through the ability of an organization to exceed the minimum standards set by Australia's legislative framework that improvements in OHS management can be identified. The occupational health and safety management system as described by AS/NZS 4801 includes organizational structure, planning, responsibilities, practices, procedures, processes and resources. These are all used to develop, implement, achieve, review and maintain an organization's OHS policy (AS/NZS 4801). By doing so, the risks associated with the organization can be managed in a systematic way. The purpose of this literature review is to explore the fundamentals of OHS management best practice, thus providing an insight into methods used for achieving utmost health and safety performance. As part of this review, the roles of policy, planning, training, consultation, risk management, safety culture, performance monitoring and benchmarking in health and safety management have been analyzed. It is through analysis of these processes that some of the characteristics that provide best practice within management systems can be revealed.

## Policy, Planning, Leadership and Accountability

Senior management commitment is regarded as a vital element in leading OHSM strategies, with early studies conducted by Cohen and Cleveland (1983) linking it with superior OHS performance. Management commitment needs to be driven by concern for a number of factors if it is to benchmark in OHS. These include legal consequences, the impact of economic incentives or penalties, the organization's moral obligation and concern about public relations (Gunningham 2004). Commitment is demonstrated through an organization's policy, effective planning, goal setting, resource allocation, risk management and employee participation (Bluff 2003). Benchmarking in safety management adopts a planned approach where goals are set within the organization. These goals are to be based on well-developed problem solving methodology, the securing of financial and human resources and the designating of OHS responsibility, ensuring that those with responsibility are held accountable (Gunningham 2004). An occupational health and safety policy is an organization's statement of commitment, intentions and principles relating to its overarching safety and health performance (AS/NZS 4801). This policy provides a framework for setting an organizations safety and health objectives and targets. The minimum requirements of an OHS policy as stated in AS/NZS 4801 include the following;

(a) Be appropriate to the nature and scale of the organizations risks;
(b) Include the commitment to establish measurable objectives and targets to ensure continued improvement aimed at elimination of work-related injury and illness;
© Include a commitment to comply with relevant OHS legislation and with other requirements placed upon the organization or to which the organization subscribes;
(d) Be documented, implemented, maintained and committed to all employees;
(f) Be available to interested parties; and
(g) Be reviewed periodically to ensure it remains relevant and appropriate to the organization.

An effective OHS policy should assign roles and responsibilities of different positions such as senior managers, line managers, health and safety specialists, safety representatives and general employees (Hansen 2006). This planned and proactive approach enables resources to be harnessed when addressing occupational safety and health issues, thus offering greater potential of preventing injury or ill health before they arise.

## Training

Blewett and Shaw (1997) suggest that a fundamental element in any health and safety management system is that of training. Minimum requirements as documented in AS/NZS 4801 suggest that organizations should identify training needs and implement procedures that ensure employee OHS competencies are being developed and maintained. This training however needs to go far beyond the 'band aid' approach of substituting for control of hazards in work systems and processes. In order to achieve this, organizations need to recognize that training is not the sole solution to unsafe working environments and performance related issues. Instead, Blewett and Shaw (1997) insist that an effective training system is one that ensures all employees within the organization have the competencies necessary to actively participate at an appropriate level within the safety and health management system. In addition, training should be ongoing, enabling employees with the resources necessary to combine ability and knowledge with the intent of safely and competently performing tasks.

In order to have successful training regimes within an organization, a safety and health management system should consider how best people learn rather than how to train them (Blewett and Shaw 1997). Blewett and Shaw (1997) suggest that this can be achieved by providing training which is consistent with a number of principles. These principles defining how adults learn best as recognized

by Blewett and Shaw (1997) consist of the following.

Adults learn best when;

- They know how they can use the learning;
- They are involved in deciding how they will learn;
- They can relate the learning to their own experience;
- The learning is organized around their current needs;
- And the learning process is responsive to different needs of individuals.

Effective training programs reflect these principles and move workplace learning from a mechanistic approach to a broader focus on the learning process (Blewett and Shaw 1997). Training should become a key strategy for assisting employee participation in the organization's OHS management system. Blewett and Shaw (1997) found that this is evident when training in specific hazards and describe that the best method for training in manual handling is one which promotes employee participation in solving real manual handling problems as apposed to simply teaching them how to lift properly.

In order to develop a management plan which benchmarks employee training and learning, a seven step approach should be adopted (Blewett and Shaw 1997). Blewett and Shaw (1997) recommend that the seven steps should encompass the following.

1. Identify what people need to be able to do now and in the future and what they want to learn.
2. Against the required standards identify what people can do and what they cannot do;
3. Identify the causes of not meeting standards;
4. Plan a program which will meet the identified needs;
5. Work out the program details;
6. Implement the program;
7. Evaluate the program and revise your strategies.

Learning, including training is vital for continuous improvement within organizations and is an essential element of OHS best practice. Best practice training encompasses more than task based activities but addresses an organization's interpersonal competencies. By doing so, safety and health become a key focus on activities, providing a safe and risk free workplace. Training should be adopted as a key strategy for supporting and facilitating the requirements set out in the safety and health management system, underpinning best practice in health and safety management.

**Consultation**

In health and safety management, consultation involves the sharing of information. This information sharing in turn promotes discussion with the aim of achieving greater understanding and agreement by all parties involved in an issue. Organization's have a legal responsibility (as documented in Section 30 of the *Occupational Safety and Health Act 1984*) to assign delegated employees as safety representatives with the purpose of consulting on safety and health issues. A safety representative is primarily concerned with day to day safety and health issues and is involved in the implementation of relevant policies. Those representing the employer and employees should also receive adequate training for effectively implementing and reviewing appropriate safety and health policies and procedures. These minimum requirements as further explained in AS/NZS 4801 oblige the need for documented procedures for employee consultation in safety and health issues within the workplace. AS/NZS 4801 also suggests that these procedures should be agreed to by employees, with their involvement in all aspects of risk management policies and procedures as well as being consulted on changes that may affect safety and health in the workplace.

Archer, Borthwick and Tepe (2009) suggest that meaningful consultation within an organization has the best effect on resolving OHS issues. This however needs to extend beyond merely informing people of upcoming changes to their work processes but allowing them to have a say in the changes that are to be implemented (Archer, Borthwick and Tepe, 2009). Archer, Borthwick and Tepe (2009) recommend that consultation be achieved through electing OHS representatives and by establishing a committee involving employer and employees. A health and safety committee is a forum in which workers and management meet to identify, discuss and resolve safety and health matters. Employers have a legal obligation to establish health and safety committees as documented in Section 38(1) of the *Occupational Safety and Health Act 1984*. This statutory role of the OHSC helps develop the OHS policies, monitor their effectiveness and make recommendations to the employer.

Wyatt and Sinclair (1998) found that the effectiveness of OHSC's and representatives are impacted on by a number of factors. These factors are identified as being the level of, management commitment, communication, training, union involvement and health and safety professionals in the workplace (Wyatt and Sinclair 1998). Milgate, Innes and O'loughlin (2001) propose that management commitment is fundamental to the effectiveness of the committee and representatives as they do not operate independently from each other. Effective commitment from management requires credibility and should be demonstrated through action. Best practice commitment is achieved through attending committee meetings, following through on recommended actions in a timely manner and providing access to necessary information (Milgate, Innes and O'loughlin 2001). In addition, management should encourage the development of action plans from the committee, request periodic progress reports and reward them for their achievements and perseverance (Wyatt and Sinclair 1998). Effective communication is regarded as the source of workplace consultation and so is vital to the successful roles of OHSC's and representatives. Communication needs to be between all stakeholders by means of information sharing, negotiating and listening in order to be successful (Milgate, Innes and O'loughlin 2001).

Training is also fundamental in the success of OHSC's and representatives as nobody should be able to take on extra responsibility and make decisions in areas they do not understand. Blewett and Shaw (1997) recommend that training should involve information about relevant legislation, as minimum practice, with best practice training focusing on the principles of accident investigation, hazard management and performance measurement. Training should also implement methodologies in which team members are required to demonstrate effective problem solving and communication skills (Blewett and Shaw 1997). Trained representatives have been shown to proficiently stimulate and participate in OHS management structures and procedures with the ability to embark on innovative safety and health issues within the workplace (Frick et al. 2000). Union involvement has also been identified as playing a significant role in enabling OHSC's and representatives to perform active responsibilities in OHS matters. This has been identified through the availability of support resources such as provision of training, information and advice (Warren-Langford, Biggins and Phillips 1993). Employee participation within organizations have been linked to strong union involvement and effective OHSC's being one's with union representation (Ochsner and Greenberg 1998). Finally, Health and safety professionals such as an ergonomist and occupational therapist are also seen as valuable contributors to the overall success of an OHSC (Milgate, Innes and O'loughlin 2001). This is through offering their expert advice and objective outlook to the issues being managed by the committee. All of these

factors and there impact on OHSC's and representatives within an OHS management system can be seen in the diagram below.

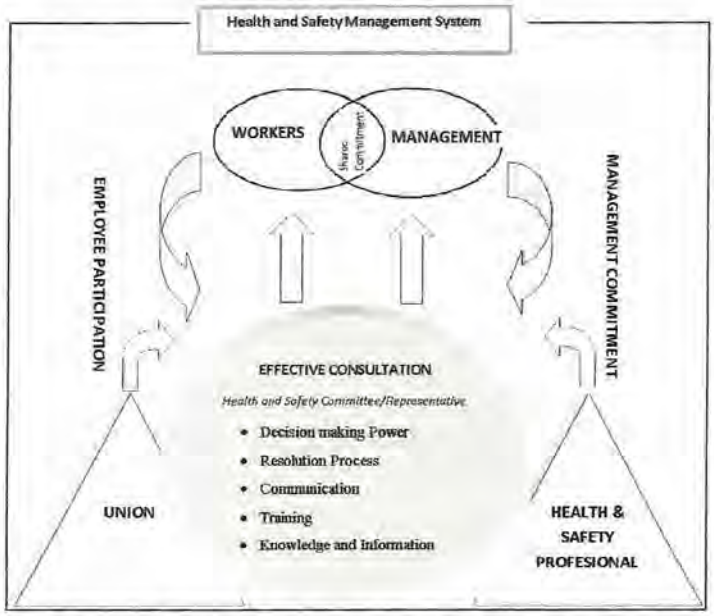


Fig.1. Factors that impact on the effectiveness of health and safety committees and representatives. Source: Milgate, Innes and O'loughlin 2001.

Health and safety management best practice involves a system in which employers consult with employees within the workplace regarding health and safety issues (Robens 1972). This ideology was introduced by the Robens Report with the intention to promote participation in workplace safety and health issues. Furthermore, Shannon et al (1996) found that employee participation in safety and health decisions was a contributing factor to lower claims rates. These organizational factors such as workforce empowerment are consistently related to lower injury rates (Shannon et al 1996). This rationale of employee participation and consultation is recognized as best practice in health and safety management and based on the premise that complete employee cooperation and commitment is at the heart of continuous improvement.

**Risk Management**

Occupational risk management is a contemporary concept which implements processes for the control of workplace hazards. Employers, contractors and self employed persons have a statutory obligation to identify hazards, assess the risks associated with the hazards and implement control measures aimed at eliminating or reducing the risks to an acceptable level (Regulation 3.1. *Occupational Safety and Health Regulations 1996*). AS/NZS 4801 recommends that as a minimum, an occupational safety and health management system should implement and maintain procedures which cover hazard identification, risk assessment and control of those hazards and risks identified. AS/NZS 4801 also suggests that organizations as a minimum should establish and maintain safety management plans with the aim of achieving those objectives set out in the policy. With the availability of standards, risk management tools are becoming more accessible, enabling organizations to manage their responsibilities more effectively. The risk management process adopted by AS/NZS 4360 describes establishing the context, risk identification; risk analysis, risk evaluation and implementation of controls, followed by monitoring and review. Glendon and Waring (1997) describe this approach as simply managing pure risks rather than additional risks over a broad spectrum.

In order to successfully manage broader risks in the workplace there is a need for strategic planning. Glendon and Waring (1997) suggest that effective risk management aims at all types of risk, including pure and speculative. Human resources for example is defined as speculative risk with Glendon and Waring (1997) finding that effective selection and management of people is vital in targeting occupational risks. Glendon and Waring (1997) also found that for management of human resources to be effective, it needs to focus on performance management, supported by appropriate strategies for reward systems, selection and personal development.

A variety of tools should be adopted for assisting the various stages of the risk management process. Glendon and Waring (1997) suggest that proactive measures such as selection and training for personnel involved, workplace inspections, safety audits, behavior sampling, hazard analysis and safety surveys should be implemented. An additional best practice approach to risk management should consider the affects of organizational change as it can have both positive and negative effects on OHS and other dimensions of risk (Glendon and Waring 1997).

In order to ensure that a comprehensive approach to risk management has been implemented, Gunningham (2004) recommends that identification of all potential sources of harm should be considered. This involves risks that may arise due to psychosocial stressors, ergonomic factors, physical, chemical and biological hazards. Gunningham (2004) also suggests that a proactive risk management system implements methods such as consultation, analysis of tasks and work roles, review of published sources and analysis of past incidents to ensure that all hazards have been identified.

The need to introduce a 'formal safety assessment' (FSA) or 'safety case' has also been found to assist in effective risk management. This ideology was recommended in The Cullen Report which followed a public inquiry into the root causes of one of the World's worst offshore accident (The Piper Alpha Disaster) in which 167 oil worker's died. Cullen (1990) recommended that analytical risk assessment techniques such as hazard and operability studies, quantitative risk assessments, fault tree analysis, human factor analysis and safety audits should all be implemented in order to effectively manage workplace risk. In addition to this system of safety management, Cullen (1990) suggests

that emergency evacuation, escape rescue as well as fire and explosion protection should be considered when benchmarking in OHS risk management.

A risk management system embracing the best practice approach can be seen as one in which the discussed criteria are met. This includes but is not limited to adopting a "life cycle" approach to risk management involving hazard identification and risk control during the procurement, planning and design of all work facets such as operation, shutdown, maintenance, cleaning and demolition.

**Safety Culture**

The premise of safety culture has recently times been receiving widespread attention. This is due to the notion that systems will function better within organizations with a developed culture of safety. A safety culture can be defined as a set of shared characteristics within a group of people (Waring 1996). Waring (1996) suggests that these include beliefs, values, attitudes, opinions, ideas, expectations, rituals, language expression and habitual responses to situations. Hopkins (2002) agrees with James Reason (1997) that an effective safety culture is one which has a reporting culture, a just culture, a learning culture and a flexible culture. A reporting culture is where employees are willing to report their errors and near misses. Hopkins (2002) recommends that this can be achieved by reserving blame only for reckless or malice behavior. This embraces a balanced approach where blame is not a routine response but rather a form of extreme measure in certain circumstances. Hopkins (2002) suggests that this promotes a just culture where reporting in general will not be discouraged. Reports however will only be effective if an organization is able to learn from the mistakes made and so Hopkins (2002) found that a learning culture is vital in embracing the best practice approach. This can be achieved through feedback, monitoring and analyzing (Hopkins 2002). Furthermore, a good safety culture is flexible in the sense of varying decision-making processes which complement the urgency and level of expertise available (Hopkins 2002).

Behavior modification strategies can also be used to promote safe behavior (Hopkins 2002). This can be achieved from safety observations requiring staff to perform safety observations on their colleagues, offering one on one feedback. Such observations however need to be applied at all levels of the organization, including top management, to have true affect. Hopkins (2002) found that these periodic observations generate improvement in reducing human factors. In addition, management commitment and participation in safety matters and meetings have been identified as a key determinant in benchmarking an organization's safety culture (Hopkins 2002). It is therefore beneficial to include the behavior of managers in the modification process as modifying behavior can by definition, modify culture.

Poor safety cultures can become underlining factors in accident causation and so it is vital that organizations embrace the best practice approach. Its importance can be highlighted in the case where 150,000 people in Japan were poisoned by drinking milk produced by the Osaka factory of Snow Brand Milk Products Co Ltd in 2000. Some of the factors blamed for the accident involved the employees ignoring company regulation that milk pipes and valves must be cleaned once a week. As a result the workers left the milk pipes for three weeks without cleaning them, causing the solid milk ingredients to remain inside a valve, breeding Bacilli and poisoning the milk. Although this incident is of a public health nature it still demonstrates how a poor safety culture can contribute to undesirable circumstances.

For an organization to bear a positive safety culture it must embrace more than a culture of compliance. To be effective, an organization must not only identify and resolve non-compliance, but it must also identify the root causes behind unsafe behavior (Hopkins 2002). Overall, a culture of safety aids in overcoming limitations of safety systems by promoting safety conscious individuals within the organization.

**Monitor and Review**

Monitor and review has been identified as an important element in measuring occupational safety and health performance within an organization. It is aimed at enabling organizations to learn from past experience, incidents and adverse events. Effective monitor and review offers an insight into weaknesses in safety management system allowing for deficiencies to be corrected. Many organizations use accident data such as Lost Time Injury Frequency Rates as the main measurement to monitor and evaluate its OHS performance. Blewett and Shaw (1997) suggest that these traditional approaches do not lead to improvements as they lack essential information and suffer from confounding factors such as measuring failure rather than success and failure to measure the incidences of occupational diseases with a prolonged latent period. In addition, Bluff (2003) found that limitations such as under-reporting, under representation of self employed, contractors and labor hire staff as well as the under-estimation of high consequence low probability risks were found from using LTIFR data for performance monitoring. A more effective approach however is by measuring an organization's OHS performance through individual behavior (Blewett and Shaw 1997). Indicators such as LTIFR's then become valuable to the positive indicators by giving a complete picture. On their own these statistics are inadequate for measuring performance as valid trends are difficult to ascertain.

Best practice in monitoring supports the use of positive performance indicators with Bluff (2003) suggesting that the focus should be on proactive measures addressing processes and preventative activities. Such measures shall involve indicators that are based on hazard reporting and control action implementation (Bluff 2003). This focuses on the quality of hazard identification and measures implemented to control risks thus reflecting positive performance.

Auditing of OHSM complements positive performance monitoring and is used to periodically evaluate the effectiveness of the safety and health management system. This is achieved through thorough examination of the organization's overall safety management system. Hopkins (2000) suggests that best practice auditing needs to examine the organization's hazard identification strategy, seeking out hazards which may be missed. This ensures that an accurate judgement is made regarding the effectiveness of the organization's hazard identification and control measures. Bluff (2003) found that this outcome can only be achieved when the auditors involved have acquired established knowledge and experience of audit methodologies, OHS management, OHS law and the technical aspects of the industry being audited.

The monitoring and review of occupational health and safety management provides a basis for benchmarking and continuous improvement within an organization. Without effective monitoring and review it is unlikely that an organization's weaknesses can be appropriately addressed and their strengths confirmed. Positive performance indicators and periodic auditing have been identified as two strategies that are most effective in reducing occupational injuries and diseases for the long term. Underpinned by a more meticulous approach to occupational safety and health management evaluation an organization is able to set a firmer basis for review and ultimately continuous improvement.

**Conclusion**

In this paper the roles of policy, planning, training, consultation, risk management, safety culture, monitor and review have been

analyzed. This analysis provides a critique for achieving best practice and continuous improvement within health and safety management systems. It has been demonstrated through literature that a planned and proactive approach to occupational safety and health management offers a greater potential. This potential enables problems to be identified and controlled before injury or ill health is caused. This is apposed to the reactive or ad hoc approach after serious incidents have already occurred. It has been conveyed how benchmarking in health and safety management is not an easy, quick or spontaneous process but rather requires sound knowledge and commitment of health and safety management principles. In addition adequate resources are needed in order to convert this knowledge into action along with the active involvement of key workplace personnel to promote ongoing improvement. Finally, it has become apparent that when considering successful health and safety management in the workplace it is important to exceed the minimum legislative requirements and strive for industry best practice. By doing so organizations can wherever possible eliminate hazards or isolate employees from them. It is therefore vital that organizations adopt best practicable methods, consistent with legislative requirements, to ensure a safe and healthy workplace for all involved.

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**Legislation**

*Occupational Safety and Health Act 1984*

*Occupational Safety and Health Regulations 1996*

# Impacts of Streptococcus Suis Infection

by: Mr. Shiu-Fai Luk, Water Supplies Department, Immigration Tower, Wanchai, Hong Kong, e-mail: sf_luk@wsd.gov.hk

**Abstract**

Streptococcus suis infection was first reported in 1968. The infection sporadically occurred in Northern Europe and Southeast Asia and in 2005 a massive outbreak was reported in China. Meningitis or toxic shock syndrome usually occurs after infection. The fatality rate is around 18%. Patients may have the squelae of permanent hearing loss or walking ataxia. The transmission route is mostly through the porcine exposure. The abattoir workers, pig breeders, butchers and domestic helpers have high risk of exposure to this infection. The possible impacts on employers and employees are discussed.

**Introduction**

Streptococcus suis is a peanut-shaped, gram positive bacteria. (Wikipedia n.d.). It is an important pathogen to pigs and can cause a rapid progressive and fatal sepsis in infant pigs associated with meningitis, arthritis and pneumonia. Asymptomatic carriage at the porcine tonsils is common and it spreads among pigs by nose to nose contact or by aerosol over short distance (Sriskandan and Slater 2006; Hospital Authority of HKSAR 2005). Other than pigs, it has also been found in a wide range of mammalian species, including horses, dogs, cats and birds (Yu *et al* 2006).

In 1968 the human infection of bacterial meningitis by Streptococcus suis was first reported in Denmark. Throughout these fifty years, the infection sporadically occurred in Northern Europe and Southeast Asia (Hospital Authority HKSAR 2005a). About 200 cases has been reported since the first discovery (Tang *et al* 2006). In 2005, a large outbreak of Streptococcus suis infection occurred in Sichuan Province, China, with a total of 215 cases reported (Yu *et al* 2006). In Australia, the first Streptococcus suis infection occurred in April 2007 and the infection was believed to be associated with occupational exposure to animal carcasses (Tramontana *et al* 2008).

**Epidemiology**

Epidemiological studies have found that high proportion of patients has had close contact with pigs or pork handling before the presentation of infection particularly with those having wounds or cuts. Since 1987 it has been recognized as an occupational disease in the United Kingdom (Huang *et al*, 2005) and in Hong Kong since 1990s (Hospital Authority HKSAR 2005a)

The major route of transmission is through the dermal contact with pigs especially those sick pigs and carcasses that died of unknown causes, (Yu *et al* 2006; Hospital Authority HKSAR 2005b). The other possible routes are respiratory (Kay, Cheng & Tse 1995) and oral intake, such as the consumption of raw pork and uncooked pig's blood in Thailand (Achara *et al* 2001). There is no evidence of man to man transmission. Thus abattoir workers, pig breeders, and butchers have a higher risk of infection (Huang *et al* 2005). Among the cases reported from Europe and China, over 90% of these patients had occupationally close contact with pigs (Beek, Spanjaard & Gans 2008; Yu *et al* 2006; Kay, Cheng & Tse 1995). In Hong Kong the % of patients with porcine exposure was about 60% (Kay, Cheng & Tse 1995).

Statistically, the risk of infection for the abattoir workers was 1500 higher than those not working in the pork industry. In the Netherlands the annual risk for adults was 0.01/100,000, while in Hong Kong it was about 0.17/100,000 in the period 1984-1993, which mostly happened in spring and summer seasons. Besides, based on the recent data from 2002-2006, the annual risk in Hong Kong is about 0.06/100,000 (Kay, Cheng & Tse 1995; Huang *et al* 2005; Hospital Authority HKSAR 2007).

**Clinical features**

Summarizing the cases that occurred before 1995, over 85% of cases had the meningitis (Kay, Cheng & Tse 1995). Of the outbreak in China, 51% of patients had the signs of meningitis, 29% got the toxic shock syndrome (TSS) and the remaining had septicemia. The symptoms included fever, chill, hypotension, rash, diarrhea, renal function abnormal, coma, vomiting, headache and liver function abnormal (Tang.*et al* 2006).

The average case fatality rate was 18% (Lun *et al* 2007). The case-fatality rate of patients with TSS was 62% and was 1% for those having meningitis. The fatal TSS cases progressed from onset to death in a median of 25 hours (Yu *et al* 2006). Among the survivors, the sequelae are comprised of moderate to severe high-tone sensorineural deafness (50-67%) and vertigo/ataxia (30%) (Hospital Authority HKSAR 2005a).

**Possible impacts**

In literature surveys other than the sequelae of infection, few papers were published on the social impacts of Streptococcus suis infection. However, the nature of these impacts and problems can be foreseen based on the social consequences described by Dembe (Dembe 2001). The general impacts on employers and employees are discussed in subsequent sections.

**Impacts on employer**

An employer's business can become adversely affected if an employee becomes infected with Streptococcus suis. For instance, the owner of a pig farm there may be massive numbers of pig deaths before the outbreak of human infection (Yu *et al* 2006). As this is an occupational disease a thorough investigation will be conducted by the insurance company and relevant government bodies, such as the Labor Department. The farmer may be sued by infected employees later on. The incident will also draw public interest. There may be pressure from the community and the company's image may be intangibly affected and also the sales volume of pig meat may decrease. The farmer would have to face a considerable economic loss and prosecution by government authorities.

> *(a) Toxic Shock Syndrome is a serious illness caused by bacteria Streptococcus. It has a rapid onset characterized by fever, low blood pressure, kidney failure and multi-system organ involvement. Diarrhea, vomiting and rash are sometimes observed (Wisconsin Department of Health Services n.d.)*

Within the farm, other employees may be scared of becoming infected with the Streptococcus suis micro-organism. Their possible reactions may include low morale, refusal to have contact with the pigs, resignation, malingering and they may even request the Labor Union to intervene because of concerns about an unsafe workplace and the incidence of Streptococcus suis infections. At this stage, the employer has to carry out necessary measures to minimize the risk of infection and regain the employees' confidence.

**Impact on the employee infected with Streptococcus suis and his family**

For the infected employee the impacts on this employee's health and life are more complicated. These not only affect the infected employee but also his family. The worst outcome of having this infection is that the employee can die in a period of a few hours or days, if effective medical care is not provided, or if antibiotics are not effective in controlling the infection. This employee's family may be devastated and have difficult in accepting this sudden change. The family may fall into economic crisis, if the infected

employee is the major source of income for the family. Distressed family members may direct their anger towards the employer as they may consider that the employer was the cause of the employee's death.

If the infected employee fully recovers from the illness, he may be scared and quit his job, as the first infection case in Australia did (Tramontana *et al* 2008). However, people who do not die from having the Streptococcus suis infection usually has the sequelae of hearing loss or walking ataxia and are considered disabled. The hearing loss is permanent and there is no cure for the ataxia (Ataxia UK n.d.). This can be a great shock to the victim and it may be hard for a previously healthy employee to accept the fact that they are now disabled in such a short time. Facing the inability to carry out everyday interactions may cause this employee to experience fear, guilt, anxiety, worry, sadness, grief, anger, frustration and a loss of intimacy (Hogan 2001, p16).

After being discharged from the hospital the employee may need to receive long term rehabilitation, which may include psychological counseling, speech therapy, lip reading and physical therapy. The recovering employee will need to use a walking stick or walking frame as the ataxia will make walking difficult due to a permanent loss of balance. A hearing aid may assist the recovering employee to hear. However, if the impairment is severe, lip reading will be the only way of conversation. If the rehabilitation program is not well planned, this employee may be at a great lost and highly frustrated. In this period, the employee's income may be drastically reduced and may affect his living standard. Over and above all of this the employee also has to handle the tedious procedures of claiming workers compensation, which may be a burden to him.

The rehabilitation of a person following infection with Streptococcus suis can take months, a year or the person may never be able to be rehabilitated to work in gainful employment again. There is the risk that this employee will be dismissed by his employer. Fear of losing his job and anxiety for early recovery can grow inside the person's mind and this will affect the progress of rehabilitation and psychological heath.

Due to ataxia and loss of hearing following a Streptococcus suis infection the person's daily life will rely on assistance from his family. This can be depressing.

The background noise can make us feel that we belong to our environment. When this tone is lost there is a profound feel of solitariness and social isolation. Over and above, background noise can increase both our sense of security in the present and our ability to cope with future situations. Hearing can warn us of dangers that we cannot see. Hence for the person with a hearing impairment, it can be anticipated that he would be frightened by a lack of security. Such feelings are strong contributory factors to depression (Lysons 1996, p71). On further development of this depression, this person may exile himself and not meet with his friends or refuse to take part in community activities.

Frustration arises from the hearing impairment barrier, which prevents the attainment of many desirable goals. For example, he gets frustrated at not being able to hear what he said or having difficulties in communicating with his family. If the rehabilitation program does not effectively improve the situation, the prolong frustration can lead him to apathy and despair (Lysons 1996pp70-71).

In this society, there is still discrimination directed to people with a handicap, such as considering this person as stupid or being ignored in conversation. Afraid of discriminated by his peers, the employee may face the dilemma of his illness being disclosed. In case the employee cannot positively face the social discrimination, he may have the feeling of inferiority and feels gloom for his future.

To the family, there are a number of problems to be solved. The financial burden is one of the key issues. Other than taking care of the children, the spouse may also need a job to stabilize the family income. Family members may have to spare a lot of time to assist the patient with recovery, such as taking him to a Language center or encouraging the employee to positively face the changes in his abilities. Changes may have to be made to the design or arrangement of furniture to fit the employee's needs to reduce the risk of injury at home. The difficulties in oral communication can create conflicts/quarrels so that mutual tolerance and acceptance will be required to be developed.

**Barriers to returning to work**

Some of the barriers to returning to work after an employee has suffered a Streptococcus suis infection may be the employee's fear of getting another infection, employer's attitude, sequelae of hearing loss and of ataxia. If this employee's workplace is a pig farm, he may refuse to work again on the farm. The recovery period may be over half a year. In view of the sequelae and long recovery time, the employer may consider that this employee is no longer fit for the job and decide to dismiss the employee. This can create despair and lacks motivation for this person to seek a new job.

If the person has the sequela of walking ataxia, his strength is much reduced and he may be limited to indoor clerical work. On the other hand, with hearing loss, this person is not suitable to have a job involving much verbal communication. These generate the restrictions on job seeking. Finally, there is discrimination for disability in the society and he may be unfairly treated in job placement.

**Impacts on domestic helper**

In Asia the infection through porcine exposure was about 42%, which was lower than that in Europe. At the same time in Hong Kong 35% of the patients were either housewives or cook (Kay, Cheng & Tse 1995) and a recent study also revealed that Streptococcus suis could be found in raw pork sold in retail markets with concentration ranged from 3 – 4600 MPN/g of pork (Cheung *et al* 2008). This indicates that raw pork from retail market is a possible route of infection. It imposes a threat to both housewives and domestic helpers. Although there is still no report of domestic helpers getting the infection, it still needs to be aware of the risk of infection.

Domestic helpers in Hong Kong are mostly from south east Asia. Those foreign domestic helpers live with the employers in the apartment of size usually less than $70m^2$. Once the domestic helper gets the infection, other than the impacts as mentioned above, the situation will be much worse and complicated. First of all, the employer does not have much human and financial resources as a company to carry out the injury management program. He employs the helper to take care of his children but now he has to seek another helper to assist the infected helper. On the other hand, 4 to 5 persons lodged in the same apartment of $< 70m^2$ is rather congested. Conflicts can easily occur and employer-employee rapport is difficult to be maintained under this condition. The employer faces the dilemma of terminating the contract or taking care of her till the end of their contract. To terminate the contract without employee's consent is a breach of labor regulation and is susceptible to a penalty from government. On the other hand to take care of her till the end of their contract may be a great load to the employer in both financial and psychological aspects.

To the employee, she will be distressed and have great concerns on her future. Her income is low and it is not possible to have better medical treatment by herself. Her recovery progress will likely be less satisfactory as those local employees that their medical treatment can be subsidized by the government. Besides, after returning home, the provision of suitable rehabilitation program is in doubt. It may not be possible for her to

return to work and the compensation may not be adequate to cover her loss.

**Conclusion**

Streptococcus suis infection is an occupational disease. The fatality rate is 18% and has the sequelae of hearing loss and/or walking ataxia. The person affected by a Streptococcus suis infection can be physically and psychologically affected and require intensive care and assistance from his family. The sequelae are the barriers of returning to work. If the person does not die as a result of the infection their future employment prospects can be restricted due to the nature of the sequela of ataxia and hearing loss post infection.

In east Asia, owing to the habit of buying fresh pork from market, domestic helpers are another group of workers susceptible to the Streptococcus suis infection. The situation described may possibly occur in some places, such as Singapore and Taiwan. It is time to review the possible strategies to help those foreign domestic helpers once having the infection.

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# Occupational Health & Safety Education for Professionals/Practitioners in the Construction Industry


by: Mr. Phil Wadick; Work Safety & Training. Email: pwadick@allohs.com.au



**Abstract**

***Context:*** The development of education for the OHS professional in the construction industry has been haphazard, ill-defined, and not evidence based.

***Objectives:*** This pilot research project aimed to discover what an Occupational Health and Safety (OHS) Professional in the construction industry actually does, what they should know and be able to do, and how they best learn these.

***Research results:*** Respondents of this research study provided the following key messages.

1. Many senior managers and OHS professionals are unhappy with the level of competency of construction OHS advisers.
2. OHS professionals in the construction industry need to keep up to date with standards, regulations, codes of practice, and current work practices.
3. They need to be highly accomplished in such people skills as leadership, negotiation, conflict resolution and communication.
4. They need to understand the practicalities of how the construction process works, including subcontracting.
5. They need to be able to develop and implement, in consultation with contractors, easy and effective occupational safety and health management systems.
6. They should take a consultative approach to risk management and particularly to determining the significance of risk.
7. They need to be able to design and deliver effective training.

Conclusion

***Recommendations:*** To help overcome this a model university degree is proposed for people wanting to work in the construction industry as OHS professionals. This degree embraces a significant work placement.

**Introduction**

This paper firstly discusses the current status of the Occupational Health and Safety (OHS) Profession including its fragmented nature, lack of a recognized core body of knowledge and the almost piecemeal approach to OHS education in Australia. It then briefly presents some initiatives that are being developed to remedy these interrelated situations. Following this the paper considers OHS in the construction industry and the challenges faced to eliminate injury and disease in such a potentially high risk industry. This includes the management of subcontractors. The methodology used in this research project is described. A rationale is provided for using qualitative methods of gathering and analyzing research data. The remainder of the paper documents the results of the research and the implications these have for OHS education for health and safety personnel working in the construction industry.

**Background**

*2.1 The OHS profession*

The total economic cost of work related injuries and disease in Australia has been estimated at $57.5 billion in 2005-06, representing 5.9% of GDP, up from $34.3 billion, or 5% of GDP, in 2000 - 01 (ASCC 2009: 1). This is despite the fact that OHS has developed rapidly over the last 20 years, with a corresponding increase in the number of OHS professionals and practitioners and the number of tertiary level OHS courses being offered (Borys, Else et al. 2006: 176). Capra (2006: 284) clarifies this by pointing out that the number of university undergraduate programs has sharply declined since 2004.

The curriculum of OHS courses at university level differs between universities (Capra 2006: 286; WorkSafe Victoria 2008: 5), while Vocational Education and Training (VET) accredited Certificate III through to Advanced Diploma courses in OHS do have a clearly defined set body of knowledge described in national competencies that are delivered by Registered Training Organizations. Today many employers are expecting OSH Professionals to have and apply in their workplaces knowledge of and skills in psychology, management, chemistry, physics, human biology and research.

The OHS profession itself is unregulated in that people who provide OHS support to industry are not required to have any particular qualifications or experience and there is little to prevent an unqualified person from setting up as a provider of OHS support in Australia (Bluff 2006: 233). This has created the situation in which the OHS profession is fragmented and not properly defined (WorkSafe Victoria 2008: 4,5), a situation mirrored in the UK (Ponting 2009). In fact, with no agreed core body of knowledge (Borys, Else et al. 2006: 187) and little clear understanding of what OHS professionals actually do (Hale and Ytrehus 2004: 26; Borys, Else et al. 2006: 176). It may be difficult to describe all individual OHS practitioners as 'professionals' (Wigglesworth 2006: 8). At this point in the evolution of OHS and its support network, perhaps at best we can call OHS practitioners as 'specialists', despite the fact that there are many persons working in OHS at an extremely high level of proficiency where their activities could legitimately be termed 'professional' (Wigglesworth 2006: 8).

The Safety Institute of Australia (SIA) position is that a "professional" is one that meets the requirements of Chartered Professional Member of the SIA or above (Pryor, 2009, personal communication). So as not to create confusion over terminology, in this paper I refer to persons working in the construction industry as OHS Advisers as 'health and safety personnel'.

To be fair, this is currently being addressed internationally (Hale and Ytrehus 2004) by the European Network of Safety and Health Practitioner Organizations (ENSHPO) and in Australia by several initiatives. One project, as part of the international ENSHPO study, is jointly co-ordinated by the SIA and the University of Ballarat (through NIOSH Australia) with the support of the then National Occupational Health and Safety Commission (NOHSC) and CCH Australia (Borys, Else et al. 2006). Its main goal is to provide insight into the role that health and safety personnel play in Australia and the types of hazards that they are involved in managing.

WorkSafe Victoria is also contributing to these undertakings by developing an alliance with OHS Professional Associations (called HaSPA), with a general aim being to help the profession define itself through the description of a core body of knowledge and thereby develop standards that will help deliver more uniform OHS outcomes (WorkSafe Victoria 2008). The SIA has recently notified its members by email that it has won additional funding to further this quest (1/7/09).

In another project the OHS Educators Chapter of the SIA received an Australian Learning and Teaching Council (ALTC) grant and has partnered with several Australian universities to identify and develop the core learning outcomes from university based OHS programs so as to strengthen the discipline status of the profession (ALTC 2007). A separate study has being conducted by Jansz (2008a) to help further understand the skills required to work as health and safety personnel and why people choose that as a career. The research described in this current paper could be seen to add to this debate.

*2.2 The Construction Industry*

The construction industry is a high-risk industry (Stromm 2001:1) with a high incidence of workplace deaths, injuries and diseases (WorkCover NSW 2001:5) and a poor safety record (Safe Work Australia 2008). According to Worker's Compensation statistics, the construction industry in Australia has the highest number of work-related fatalities (ASCC 2009b:30) and the fourth highest incidence of employment injuries (ASCC 2009b:5) of all industries. The incidence of injury in the construction industry throughout Australia is 50% higher than the all industry rate (Breslin 2004:564). Despite this high toll these statistics do not accurately portray the real picture in the industry (Mitchell and Boufous 2005) because workers compensation data does not include sole trader subcontractors who constitute a large proportion of workers in the industry (Wadick 2007:144), and does not accurately reflect the number who suffer permanent or fatal work related diseases (Cowley 2006:1-2). A Royal Commission conducted in 2003 revealed that the construction industry OHS performance was in 'dire need of improvement' (Biggs, Sheahan et al. 2006:2).

Subcontracting has become a major feature of the construction industry and Silberberg (1991:1) asserts that subcontractors make up about 90% of workers in the domestic housing segment of the industry. There is mounting evidence that this shift to subcontracting is having negative health and safety effects on these types of workers (Quinlan 2003:4; Biggs, Sheahan et al. 2006:2). Monitoring and enforcement of OHS is more difficult at workplaces such as building sites that have multiple subcontractors, and it increases the risk of instances of 'paper compliance' escaping undetected (Quinlan 2003:6). Hence, management of subcontractors is a key feature in the success of any OHS management

system in this industry (WorkCover NSW 2001:28), yet subcontractors have received little OHS research despite their importance to the construction industry and the Australian economy (Mayhew, Quinlan et al. 1996:61).

Despite the OHS challenges posed by the construction industry, research suggests it has a very low percentage of health and safety personnel compared with other industries (Pryor 2006:7) and it is likely to depend on the size of the organization (Biggs, Dingsdag et al. 2008:7; Office of the Federal Safety Commissioner 2008). Compounding this is the fact that there is no nationally based or accepted framework that describes OHS competencies for safety critical people in the industry (Biggs, Sheahan et al. 2006:2).

Interestingly, a study in the UK suggests that where construction companies do employ a Safety Professional there is a definite link between investment in OHS advice and a reduction in the number of accidents and injuries and their costs (IOSH 2008a). They also found that accident rates dropped by nearly 60% in companies with in-house health and safety personnel compared with those that only employed consultants. A study in the United States of America (USA) found that a majority of workers participating in a large case study were of the opinion that the site Safety Professional staff helped keep them safe (McDonald, Lipscomb et al. 2009:58). Although no comparable study has been done in Australia, safety leadership is understood to be critical to successful OHS in the Australian construction industry (Biggs, Sheahan et al. 2006).

## 3. Methodology

### 3.1 *Research – why bother?*

This research is closely aligned with a PhD research study at Monash University. The researcher has a long history of involvement with the construction industry, firstly as a trades person small business operator and employer, and then as an OHS consultant and trainer to the industry. The researcher has conducted several previous research studies in the industry (Wadick 2007; Wadick 2008). This 'emic' connection helps to frame discussions and ground them in the realities of the participants, which adds credibility to the data. The practical experience of the researcher makes it difficult for research participants to deceive the researcher and easy for the researcher to know what questions to ask to encourage research participants to think deeply about their perceptions; when conducting the interviews the researcher is not just opinion-polling but is actively engaging the participants in critically reflective practice.

There is limited research into what construction industry health and safety personnel actually do, what they would like to be able to do, and what they should be able to do. There is also a dearth of university or VET based OHS courses specifically designed for the construction industry although Deakin University offers an introductory OHS subject for construction project managers.

### 3.2 *Theoretical framework*

The research that has been conducted is a small scale exploratory pilot study designed to help define the issues. Consequently it was thought best to situate this research within a qualitative paradigm so that the participants, who themselves are extremely interested stakeholders, could have the chance to name and describe what was important for them. The results of this research may help inform future studies, whether they be quantitative or qualitative theoretical frameworks or methods used.

Much previous research into what health and safety personnel do has been quantitative (Hale and Ytrehus 2004; Borys, Else et al. 2006; Jansz 2008a), using surveys distributed on the internet for data collection. This type of quantitative research has its own limitations. For example, Borys et al (2006:188) note that 'it may even be possible that the framing of the questions in this survey still miss some of the core tasks and associated skills and knowledge'. Pryor (2008), also discussing the results of the same survey, acknowledges that there may be several interpretations to their findings (2008:6,16) as the questionnaire could not ask respondents to elaborate on their responses, and especially does not answer the question of why they do certain things or the challenges they face in carrying out their role. This research used in-depth interviews so that the researcher could explore underlying forces at play, forces that require navigation between competing stakeholders.

### 3.3 *Research aims and purpose*

The researcher conducted this research to find out more about the role that safety personnel have on construction projects. The reason for this was to be able to make credible and appropriate recommendations for the education for Safety Professionals who wish to work in the construction industry and to discuss the place of such education in helping them to improve their effectiveness in carrying out this construction industry occupational safety and health management role. This research may make a substantive contribution to the debate/discussion concerning education for the OHS Practitioner and Professional. It may also be seen as situated within the wider context of defining the OHS profession.

### 3.4 *Data collection*

Data was gathered ethnographically through a mixture of 10 in depth semi structured interviews, tape recorded and transcribed, and a small selection of written questionnaires. The researcher engaged in seven follow up phone and email conversations with some of both interviewees and questionnaire respondents to help clarify some points that they were making to ensure the researcher understood correctly research participants' intended meaning. Further data was gathered from a document analysis of 166 emails between members of an OHS practitioners e-network who are largely from the construction industry. It was felt that the emails reveal some of the things that are important for health and safety personnel. A draft paper was written and sent out to research participants inviting their comments. A total of five responses were received, all of which agreed that the results and discussion presented in the paper accurately reflected their experiences. This adds credibility to the findings of this research project.

Caveat: Even though this is a small study it was felt that it can help open up the subject to view, and may help provide guidelines for future larger scale research. It does give an accurate representation of the ideas of many research participants and may therefore offer some valuable insights.

## 4. Results

### 4.1 *Research participants.*

Research participants were all male and occupied a wide variety of positions in construction companies. The participants were from companies who aimed for best practice OHS to those whose main goal was minimum compliance. A small percentage of participants possessed university undergraduate and/or post graduate degrees. At least one research participant had part completed a post grad qualification and others attended a variety of short courses and/or certificate/diploma courses. All had many years of practical experience working as health and safety personnel.

### 4.2 *Interviews and questionnaire*

A total of 10 interviews lasting from 1-1½ hours each were conducted, comprising 7 health and safety personnel, 2 construction laborers and 1 workplace trainer for the construction industry. The data from the interviews was coded into themes and revealed many things, some of which support previous research and often provided deeper insight into those issues than is afforded by survey responses. A total of 6 questionnaires were returned, a low number but they do support the information from the interviews.

Data obtained from the 6 respondents is presented in a linear, rational fashion to make

sense of all the stories. The researcher uses the words of the participants to support research interpretations and research participants words are presented in *italics*. The health and safety personnel's role is called many things, apart from the remark from one participant: *you know you're doing your job right when you get your name written on the toilet wall! Ha ha.* All of the following job titles were used: safety officer, safety coordinator, safety advisor, compliance manager, safety guy, safety rep, safety manager, and state/national safety manager, but they all seem to refer to much the same thing: *We call them safety coordinators here, in our business over here, which is the same as the safety officer.*

The jobs they perform are diverse and complex. They could be divided into 'hard' and 'soft' skills, 'technical' or 'interpersonal'. Biggs et al (2006) propose a framework for safety competency that is underpinned by four key principles: safety knowledge, leadership behavior, interpersonal communication skills and the safety attitudes, values and beliefs. The researcher is using a competency framework concept. 'Competence' is defined for this research study to be comprised of certain attributes which include knowledge, skills and attitudes. This research study uses these three attributes of competency to help the researcher frame the discussion of the research results.

All interviewees presented themselves as competent and professional, although it was acknowledged that not all health and safety personnel in the construction industry are: *There are some really good guys out there- but they are hard to find.* It could be that some of these lesser quality ones have little or no training and have just fallen into the position and stayed there; *maybe a builder will elevate somebody into a position where they might be in charge of safety onsite, and that person hasn't been appropriately trained and they don't know the rules.* Jansz (2008b: 12) also found that there is a small percentage of people working as health and safety personnel who have no motivation for the work, and either 'fell into it' or was 'talked into it'.

4.3 *Knowledge*

All the interviewees agreed that in-depth and accurate knowledge is vital to successfully carry out their role. For example, knowledge of both statutory and non-statutory legislation. As one person put it, *They've gotta have codes of practice as bedside reading when they are in a project and they have got lots of trades there, they've gotta know what the rules are,* or another: *the best thing for the safety person is to know what they are talking about.* Importantly this knowledge must be industry specific – they need an excellent understanding of how the construction industry works, with its multiple subcontracting arrangements and constantly changing site requirements. If they work for a mobile crane company they must understand rigging, cranes and scaffolding so they can troubleshoot and provide solutions. If they are on a large concreting job they must understand scaffolding and form work and the differences between them. If they work at heights they need to understand such things as how to inspect and/or wear a harness. If they do not know these things that they expect their workers to know they can lose credibility as a safety leader: *I was asked to go on an audit with them and one of these guys, a falls from height expert, and we all stood in the carpark, they tried to figure out, and this is our falls from height expert remember, as well as the international auditor, trying to figure out how to put the harnesses on, ha ha ha.*

The question is of course how best to get this required knowledge? Formal OHS education did not rate highly as it *doesn't look at the types of skill sets you need.* Much OHS education takes an atomistic and technical-rational approach that breaks OHS into discreet parts (for example, risk management, legislation, consultation, accident investigations and so on) and assumes that knowledge of these will equip you for your role. A person who had completed a Graduate Diploma in OHS was asked the question: 'Did you find that formal kind of training very useful for what you do in your role?' He replied: *NO, ha ha....it was, it taught us how to put together reports in a formal way....there's not much detail in the course...most lecturers are out of touch.* However, another suggested that he found studying OHS after many years in the workforce quite useful as his practical experience made the theoretical nature of the degree more meaningful.

Some literature about OHS professional practice has undertones of elitist thinking, as Borys et al (2006: 191) accuses those practicing OHS without qualifications as being 'subprofessional'. Wigglesworth (2006: 10) urges caution in encouraging the development of special interest groups that 'serve some sections of the community at the expense of others, and disguise this self-interest under the false ideology of expert service'. One participant in this research writes: 'Educators seem to view the world from their own utopian existence', often judging on the job learning in response to direct needs as being of a lesser quality than generic and conceptual learning of theoretically best practice methods and models at university.

So if the research participants state that current OHS education is not adequately meeting the requirements of the construction industry professional, what is the answer? The research participants have many suggestions which may be summarized as: there is room for formal education courses conducted by industry OHS specialists that incorporate significant work placement. For example, *before you do your finals you've gotta do some time on a job.* Interestingly, this time on site must NOT be wasted by spending it all on paperwork but must have a significant component *on the tools – they should be getting out there and getting a pair of gumboots on...sitting with the excavator driver and seeing what he has to say.* This system should incorporate a formal mentoring process by skilled and registered mentors.

4.4 *Skills*

The skills required of the construction industry health and safety personnel are many. Firstly, a core theme that runs through all the data collected in this research study is the need for excellent communication skills. In answer to the question 'What skills are important to work in safety, one person replied: *Ideally a trade, but practically that's not gonna happen...so then the next best thing is for them to be able to communicate and to be approachable.* As a safety professional you can't know everything, so when unsure, ask questions and listen, don't pretend you know. Safety guys *must know what they are doing and even if they don't know what they are doing they need to be able to communicate with the contractors so they can keep pace with them.*

Secondly, management and leadership skills are vital. Jansz (2008a) also found that the top two skill sets identified by safety practitioners were communication and management. By 'management' respondents mean being able to understand and manage the multiple contractors by facilitating smooth transitions between processes – akin to the role of project manager: *we've trained the safety guy over there to make sure that he's got the scaffolders ready and the penetration covers ready to go on the day that we're gonna strip.* In this way a competent 'safety guy' can help production and safety dance hand in hand. Health and safety personnel who do not adequately plan, who are not organized or are not knowledgeable enough, create the safety versus production dualism and *slow you down.*

Even though few health and safety personnel have direct authority and a budget from which to allocate resources, they are safety leaders. Leadership is different from management. Leadership is about influencing, negotiating, coaching, advising and encouraging; it's about getting the best out of the people in your

workforce. This requires an understanding of the needs of all the stakeholders and working to find solutions for all. It rarely requires an autocratic approach but an empathic style of active listening and leading by example. *....to communicate with a subby I guess is to open the channels, to say to them, I'm here to help, not to be negative.* Jannadi (1995) also found the effective use of human relations improves safety programs in the construction industry in Saudi Arabia.

An important stakeholder that health and safety personnel negotiate with and try to influence is senior management, because it is often only they who can action requests requiring financial expenditure: *I think negotiation is probably one of the best ones...and influencing people...and say, no we've gotta go that extra step so that the risk is mitigated. And being able to influence, particularly senior management...being able to influence them to say, they can rethink about it and so they say ok we need to go back and think about this.* To be able to do this effectively it helps if you can integrate your advice into a business case: *there's that...presenting a business case for any decisions and from a health and safety point of view.* And this health and safety person did not learn this through formal education: *It's something that I will do, that I've learnt through other parts of what I've done.* He suggests that this be included in OHS education for the professional: *Yeah, that's the type of thing that needs to be included in the training session and say look this is what you need to know...this is what, if you want to get a proposal across the line you need to be able to do this.* This skill is often required in association with the ability to make presentations, to either management or any other stakeholder. Again, this can be learned in training courses.

Another important skill is the ability to conduct research because of the changing requirements of the job and the consequent need for lifelong learning. The other skills are largely technical – writing reports, use of computer, writing jsa's or swms, reviewing safety management plans, choosing appropriate PPE, and so on.

4.5 *Attitudes*

The first and foremost attitude required for success is to be helpful: *you make sure they have their jsa's done, and furthermore you help them do it...having a system in place enables the safety guy to help rather than act as a policeman.* This helpful attitude smooths over the us versus them and shows positive leadership. A critical way of demonstrating helpfulness is by having a 'solution focused' attitude. There are many health and safety personnel who give OHS a bad name: *A lot of the time I find that guys in this particular profession are NO men – they just say NO straight away for whatever reason. It's just NO. Prove otherwise.* This attitude is counter-productive in that it can encourage shortcuts: *the safety person is there to make sure the subcontractor can get out of the job as quickly as possible because that's the only way the subby is going to make any money. If the subby's losing money then he's going to take shortcuts.*

Many participants lamented the increasing tendency towards needlessly burdensome paperwork which is being driven by the perceived need to create a defense against the liability of management. Due diligence has a lot to answer for! It was reiterated by most that this is less about keeping workers safe and more a matter of *who has the most paperwork wins.* However this is not very effective for improving construction industry safety: *It's not about the paperwork; paperwork is there to back up your solutions.* And another adds: *people make it too hard by just making it a big paper chase and no guts; it's just about the paperwork, tick and flick, and that's just a waste of time.* The amount and type of paperwork is not enshrined in law, *it's largely subjective.*

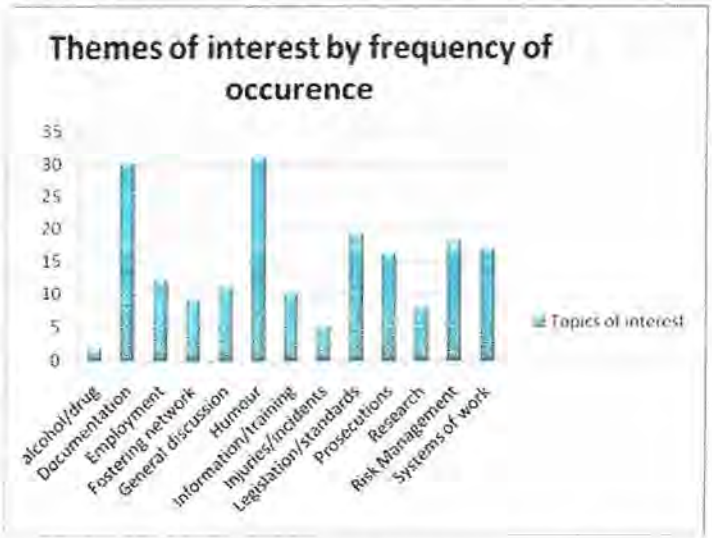
Compounding this is *there's no standard across the industry what individual principal contractors want.* Hence, there is room to move here. The successful management of subcontractors requires simple, streamlined and effective systems, including paperwork: *tell us what you're gonna do and how you're gonna do it, and you've spoke to you're guys and they know what you're doing.* The important point is that if you make it easy for the subbies to comply, they will: *we've developed some fairly simple formats for them to follow – just give us this, this and this...we don't want them giving us crap.* Another extols the virtues of keeping it easy: *We printed out pages and put it into folders [for the subbie]...it was more or less reports of information. It was good. We've had no complaints and full compliance. I think that the best part about it was it was handed to them...so on this day I want you to fill this out or give me this info. And that's all they had to do...and for the rest of the month you concentrated on helping the guys to comply out on site.*

So, when you combine in-depth OHS knowledge, project and process management expertise, great communication and leadership skills with a solution focused helpful attitude you have created the perfect safety professional. Ah yes, also a relatively thick skin or thick cranium for all those people you can't please all the time and those brick walls you regularly bash your head on! *You get up and you beat yr head against that brick wall everyday. It is like that, a lot of days in the profession.*

4.6 *Content analysis of email correspondence*

One method of gathering data was through the analysis of 166 emails between members of an OHS practitioners e-network. It was felt that this correspondence reveals some of the things that are important for OHS professionals, especially in the construction industry. The emails were coded into themes of interest, and then put into the following graph (see table 1). This method of gathering data, to be ethical, required the consent of the participants in the e-network because they did not know that the researcher would be using the in-house informal conversations. Therefore the researcher wrote the coding, made up the table and sent it out to everyone who was part of this network informing them of the research, asking their permission to include their emailed conversations in the research study and inviting comment. The researcher suggested that each person had the power of veto, but that the researcher would ensure that no person or business was identified in the writing of the research results. No participants vetoed, several gave the researcher encouragement, and some took the opportunity to comment. Table one includes some of the comments. There were other similar comments.

**Table 1. Content analysis of OHS e-network email correspondence**




This graph could reveal more about how the researcher interpreted all the emails more than the intent of each sender because the researcher did the coding and named the categories. For example, the emails in the category named 'Prosecutions' could actually have a different intent from just describing prosecutions. The intent of sending information about prosecutions could have been to help the members of the group understand more about the breakdown of OHS management systems rather than focus on prosecutions for their own sake. The researcher was challenged by the large number of emails categorized as 'Humor'. For humor the content was almost invariably OHS related, but with a funny side explored.

The bar representing 'Fostering the network' is relatively small but all the emails themselves intrinsically foster the network. Almost all of the emails represented by 'Research' were initiated by the researcher because the researcher was a member of the group who did not work as an OHS adviser employee: the researcher is a self employed OHS trainer, consultant and researcher. Many of the emails are grounded in asking for and giving help. Some of the research participants made the point that health and safety personnel often work alone and can become very isolated. This network is a successful way of combating that isolation and helping health and safety personnel to feel part of a team, part of a bigger picture. It is a way of sharing knowledge and experiences and helps to keep members fresh.

The table does capture that health and safety personnel are very interested in having a good understanding and knowledge of legislation, both statutory and non statutory; it shows that they need to create and/or obtain relevant OHS documentation to use in the workplace, that they are regularly trying to improve systems of work and pay a lot of attention to risk management. What it does not show are the qualitative influences on their lives as health and safety professionals – the challenges they face in dealing with how people intersect with the systems; the graph does not show how they navigate between the competing powers and interests that are inherent in the workplace.

## 5. OHS Education For The OHS Professional

From the preceding discussion some constructive recommendations may be offered about how best to educate the OHS professional for a career in the construction industry. The researcher's comments apply to the university undergraduate sector and recommendations are made that offer a good chance for people to be well prepared for their career to work as a Construction Occupational Health and Safety Professional by the time they finish the university degree. With some thought and effort some of these subjects may be massaged into post graduate subjects to build on the education that students receive in their undergraduate degree.

People designing OHS courses could learn from many other disciplines – offer a generic OHS degree with the opportunity to major in one or more fields. An OHS degree would offer the common subjects like legislation, risk management, consultation, incident investigation, emergency management, occupational hygiene, ergonomics, research skills, and so on. For people intending to work as an OHS professional in the construction industry a major would then offer construction industry specialist courses that would specifically seek to look deeply at managing OHS in that industry. It would offer courses on understanding the industry itself with its multiple subcontractors and tender based job allocations. There would be at least one topic on process control and/or project management and how the health and safety personnel must manage smooth transitions in a constantly changing environment.

For the Majority of people who want to work as a Construction Safety Professional there needs to be specialist subjects, or components of subjects that deal with heights, manual handling, slips trips and falls, electricity, hazardous substances, form work, scaffolding, rigging, moving plant, machine safety, cranes, all with a construction industry focus and referencing codes of practice and Australian standards. These could include such short industry based courses as work at heights training, confined space training, chemical users course, scaffolding and crane tickets, and so on. Part of university education is to learn how to find out information and how to research best practice. Most importantly such a major would incorporate a significant work placements to develop practical skills and would involve a research project and mini thesis.

Construction companies would have to be recruited to allow students to undertake work experience as is done for school teachers, nurses, physiotherapists, doctors, dentists, and so on. It will need a coordinated approach between universities and industry and would open up significant opportunities for partnerships to develop. Considering that the commercial construction industry was valued at $50 billion in 2003-04, employs more that 775,000 people and accounts for approximately 6.8% of Australia's GDP (Pillay, Ryan et al. 2006: 3), there should be some money available from the industry in the

spirit of contemporary 'user-pays' economic philosophy.

The findings of this study, and that of Jansz (2008a & b), demonstrate that communication and management are the two areas that occupy a lot of the time and effort of the construction industry health and safety personnel. Other research suggests similar tendencies: Borys et al (2006:186; Hale and Ytrehus, 2006: 27) highlight communication and consultation as key tasks for OHS professionals. Biggs et al (2005) indicate the strong role that leadership style, communication and workplace collaboration have in developing and maintaining a positive safety culture. In the UK a study commissioned by IOSH (IOSH 2008b) found that some of the key areas in which practitioners will need new knowledge and skills are influencing and leadership, communication, management and organizational skills. In Australia there is a lack of a major area of study specifically for the OHS professional in which to develop these skills. Hence, OHS degrees for people intending to be practitioners, in order to offer everything that is necessary and sufficient, need to include such subjects. How this is achieved is a matter for debate.

This research, and that of IOSH (2008b), suggest that training and presentation skills are also necessary. It may be sufficient to include something like the Certificate IV in Training and Assessment, or strategic components of it in an occupational safety and health tertiary education course for people who want to work in the construction industry as Occupational Health and Safety Professionals.

How can this educational curriculum have the best learning outcomes? The researcher believes an occupational safety and health tertiary education curriculum must contain a balanced mix of theoretical and practical subjects and applications. Networking and teamwork could be encouraged by some group based problem solving projects, communication, leadership, influencing and conflict resolution could incorporate real case studies and role plays in which students learn and practice the skills they will need. These issues need fleshing out but they must be firmly based in learning theory and not just on the need for universities to turn a profit.

**6. Conclusion**

This paper has presented the results of a pilot research project designed to help better understand what health and safety personnel in the construction industry actually do and to use this information to help inform how best to educate people who wish to work as OHS professionals in the construction industry. Construction is a practical industry and construction workers are practical people who create tangible assets. Health and safety training needs to be practical and geared to the construction workplace as this workplace is very specialized and is like no other. The workforce is highly mobile and specialized. Jobs are awarded on the basis of quotes. Hence, one only gets paid for what one produces. This piece rate type of work does encourage rushing, does encourage short cuts. However, with good people and process management and good design, the safety performance of the industry can improve. Safety professionals are only one part of it.

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# Occupational Safety and Health Performance Index For Safety and Health Management Systems

by: Mr. Teh-Sheng Su; Chairman of the Department of Health and Safety and Environmental Engineering, Central Taiwan University of Science and Technology, Taichung City, 406, Taiwan. E-mail: tssu@ctust.edu.tw

**Abstract**

It is noted that reliable performance index is essential for the establishment of a quality management system of safety and health, which aims to continuously improve and reduce incidents of occupational injuries and diseases. Such index is used to measure the implementation of business in safety and health management. The purpose of this research is to investigate the adequacy and feasibility of the safety and health indicator weighting allocated by experts, and the implementation of the performance evaluation from on –site safety and health personnel.

**Keywords:** Occupational safety and health management system, Voluntary protection program, Performance index of occupational safety and health.

**Introduction**

Taiwan occupational injury rate has decreased dramatically in recent year, such as the fatality rate per million workers decreased 56% from 77 in the year 2000 to 34 in the year 2007(CLA,2008), approaching the performance of developed countries. However, as compared with the UK (7.5 fatality rate per million workers)(HSC,2008), Taiwan still has to improve especially in the area of risk assessment of occupational safety and health (OSH). Thus the government adapts international management system framework to encourage organizations integrating occupational risk assessment into their best practices of business operation.

The Council of Labor Affairs of Taiwan refers the frameworks of OHSAS 18001 (2007) and ILO-OSH (2001) to issue the "Guidelines of Taiwan Occupational Safety and Health Management System" (CLA, 2007), simplified as TOSH-MS, in August 2007. The TOSH-MS shall lead the traditional OSH system towards a proactive, risk-based systematic management system. The government should motivate employers, owners, managerial staff, workers and their representatives in all organizations to apply appropriate occupational safety and health (OSH) management principles and methods to continually improve OSH performance, according to the organization's size and the nature of their activities.

Safety and health performance is defined as the overall performance of the safety and health operation management in an enterprise. Safety Climate is people's perception of the organization's Safety Culture. Culture is the way the group of people at the workplace do things. A Safety Culture can be positive and promote a high standard of occupational safety and health, or negative and promote unsafe actions and situations. Culture in a workplace is usually driven by top management's directives and actions. Studies conducted in Taiwan and other countries indicated the safety and health performance was highly associated with the safety climate of the organization and could be substantially improved through scientific methods (Markus, 2003, Kristin, Michal & Ronald, 2003). In an ideal enterprise organization for individual safety and health performance, shall be integrated with the overall performance of the enterprise in order to incorporate all of the resources to achieve the goal of safety and health (Lust, 1996). The UK and other European countries have begun to promote the system of occupational safety and health management and establish safety and health related performance indicators and their occupational safety and health practices are followed by other countries (HSE,1991), Standard Australia &Standard New Zealand, 1997, JISHA, 197, ILO, 2001).

Meanwhile, the United States of America (USA) has promoted the voluntary protection program based on these performance standards used by the European countries. Furthermore, the promotion of voluntary protection has been set as the strategic goal (AIHA, 1996, OSHA, 2003) and the indicators for occupational safety and health performance management were established accordingly. In the past years, occupational safety and health was challenged by the effectiveness of performance evaluation. The use of post-incident punishment-oriented performance indicators may be improper or inefficient to resolve the fundamental problems in safety and health aspects.

Currently, incident rates or severity rates of occupational accidents are the most often used indicators to evaluate the safety performance of companies, departments, or equipment. However, this is considered a reactive approach, which cannot promise efficiency of the occupational safety and health

management system, sensitivity of the safety and health diagnosis, the efficacy of safety and health system for hazard control, and effectiveness of the safety and health program. (Petersen, 2000) The monitoring system for occupational safety and health performance in the enterprises may combine both proactive and reactive approaches. Generally, data obtained from both proactive and reactive monitoring may serve as the collective indicators to evaluate whether the goal of effective occupational safety and health outcomes are achieved. The enterprise may build its own evaluation indicators for safety and health performance that matches the size and the attributes of the enterprise. The evaluation of occupational safety and health performance on all conform to the specific indicators for safety and health performance and quantify them to the value of its application. Furthermore, collection, management and statistical analysis of the data based on these indicators may also allow the stakeholder to be familiar with the operation performance of occupational safety and health management system in the enterprise(Philips & Williams, 1999).

Occupational safety and health management system was first proposed by the British Standards Institution of the UK in 1996 (BSI,1996). The component of this management system includes policy, organization, planning, implementation, performance evaluation, performance review and auditing. This system, certified in the format of OHSAS18000, is based on the concepts of risk management and widely adopted by other countries (BSI, 2007). Evaluation results of occupational safety and health performance may provide the safety and health management system the operation indicators (Stricoff, 2000). The evaluation principles include:

(1) providing substantial indicators through the evaluation of safety and health and confirming the improvement made via these indicators,

(2) designating personnel to supervise each safety and health performance evaluation program and assessing the supervisor's working attitude and capability through his/her executing the evaluation program,

(3) providing feedback mechanism through each evaluation procedure to enhance the functions of the indicators for safety and health performance and to modify the inappropriate safety and health indicators.

## Materials And Methods

The questionnaire of "Investigation of Safety and Health Performance Indicators in Taiwan" was developed based on literature review and research purpose of the present study. This questionnaire is composed of three parts: basic information, survey of weighting for the management performance indicators and the different analysis for evaluation methods between the experts and on-site safety and health personnel.

The indicator weighting was conducted in hopes of integrating proactive performance indicators and reactive performance indicators for the occupational safety and health management system in Taiwan. A total of ten items of safety and health indicators were studied, including: safety and health policy and vision, planning of safety and health goal, satisfaction of client and community, review by management level, risk assessment and prevention measures for accidents, auditing and performance evaluation, organization counseling and training of safety and health, emergency response and accident handling, risk control measure for safety and health, and operation of safety and health practice. The Delphi method was used by expert questionnaire administration to evaluate the allocation of weighting within 10±5 points.

## Results And Discussions

Results of the first and second survey on indicator weighting for main and sub-topics of safety and health performance allocated by experts showed that "risk control measures for safety and health, as shown in Table 1," was allocated the highest weight of 12 points. It was perceived by experts that risk control measures for safety and health shall be emphasized and strengthened.

The next two weights of 11 points were allocated to "Auditing and performance evaluation", and "Organization, training and counseling for safety and health". These two indicators were followed by "Policy and vision of safety and health", "Planning of safety and health goals", "Risk assessment and prevention measures for accidents", "Emergency response and accident handling" and "Operation of safety and health practice", all were allocated by 10 points. In terms of the adequacy of indicator weighting allocation, as the difference of weighting allocated to each indicator was within 2-3 points and these indicator weights were all close to 10 points, it is thought that the distribution of weighting for the whole set of indicators was in good shape (Please see Table 1).

**Table1:** Distribution of weighting for safety and health performance indicators allocated by experts (N=33)

| Indicators | First Survey | | | Second Survey | | |
|---|---|---|---|---|---|---|
| | Mean | S.D. | Post-adjustment | Mean | S.D. | Post-adjustment |
| Policy and vision of safety and health | 10.4 | 2.00 | 10 | 10.3 | 0.90 | 10 |
| Planning of safety and health goals | 10.9 | 1.90 | 10 | 10.1 | 1.30 | 10 |
| Client and community satisfaction | 8.9 | 2.30 | 7 | 7.8 | 0.90 | 7 |
| Review by management level | 10.7 | 2.10 | 10 | 9.6 | 1.40 | 9 |
| Risk assessment and prevention measures for accidents | 10.5 | 1.50 | 10 | 10.7 | 1.00 | 10 |
| Auditing and performance evaluation | 11.6 | 1.70 | 11 | 11.1 | 0.90 | 11 |
| Organization, training and counseling of safety and health | 11.3 | 1.40 | 10 | 11.2 | 0.70 | 11 |
| Emergency response and accident handling | 11.1 | 1.70 | 10 | 9.9 | 1.20 | 10 |
| Risk Control Measures for safety and health | 12.4 | 1.70 | 11 | 12.4 | 1.00 | 12 |
| Operation of safety and health practice | 11.6 | 1.60 | 11 | 10.8 | 1.40 | 10 |
| Total score | 109.4 | | 100 | 103.9 | | 100 |

Table 2 indicates that 15 experts (45.5%) generally considered local governmental labor inspection agency the most suitable evaluation institutes. On the other hand, 187 on-site safety and health personnel (30.9%) also considered at labor the same result. Table 3 indicates that 26 experts(51.5%) suggested a 3-year interval for performance evaluation, On the other hand, 243 on-site safety and health personnel (40.1%) suggested an 1-year interval for performance evaluation. Results of $\div^2$ test revealed a significant difference ($P<0.01$) between he experts and the on-site safety and health personnel in perception on institute and interval appropriate for implementing the performance evaluation.

Table 2. Difference between the experts and the on-site safety and health personnel in the perception on institute appropriate for implementing the performance evaluation.(N=639)

| | Experts (n=33) | On-site safety and health personnel (N=606) | $\chi 2$ | P-value |
|---|---|---|---|---|
| | Number (¢H) | Number (¢H) | | |
| | | | 19.9 | 0.01 |
| Council of Labor Affairs Executive Yuan Taiwan | 2(6.1) | 131(21.6) | | |
| The local governmental labor inspection agency | 15(45.5) | 187(30.9) | | |
| Safety and Health Technology center (non-profit org) | 3(9.1) | 128(21.1) | | |
| ISO certified organization | 10(30.3) | 80(13.2) | | |
| Confederation of Trade Unions | 0(3.0) | 11(1.8) | | |
| Insurance Company | 1(3.0) | 6(1.0) | | |
| Safety and health training institutes | 0(0.0) | 42(6.9) | | |
| Others | 2(15.2) | 17(2.8) | | |
| Missing value | 0(0.0) | 4(0.7) | | |
| Total | 33(100.0) | 606(100.0) | | |

Table 3. Difference between the experts and the on-site safety and health personnel on the evaluation interval

| Evaluate Evaluation Interval | Experts(n-33) | On-site safety and health personnel(n=606) | $\chi 2$ | P-value |
|---|---|---|---|---|
| | Number (.) | Number (.) | | |
| | | | 56.3 | 0.00 |
| 6 months | 0(0.0) | 45(7.4) | | |
| 1 year | 1(15.2) | 243(40.1) | | |
| 2 years | 5(30.3) | 166(27.4) | | |
| 3 years | 26(51.5) | 132(21.8) | | |
| 5 years | 1(3.0) | 16(2.6) | | |
| Missing value | 0(0.0) | 4(0.7) | | |
| Total | 33(100.0) | 606(100.0) | | |

## Conclusions

In conclusion, the weighting design for performance indicators was believed credible and may serve as the reference for future modifications of the weighting standards for evaluation items in the current voluntary protection program in Taiwan, and the governmental inspection agency will be the most suitable evaluation institute.


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www.worldsafety.org
info@worldsafety.org
editorial_staff@worldsafety.org