



# **World Safety Journal**

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# ରାଇରକେଲା ଇସାତ କାର୍ଖାନା ROURKELA STEEL PLANT

- Workplace Health and Safety Investment and Good Business Performance
- Behaviour Based Safety for Corporates: a Shift toward an Interdependent Safety Culture
- What is Considered an Effective Health and Safety Committee ?
- Examining Mental Health in the Workplace
- Return to Work after an Injury

In This Edition

- Relationship between Good Business Management and Occupational Safety and Health
- Is Education and Training Required for Workplace Safety?
- Combating Road Traffic Congestion in Beirut, Lebanon

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**WSO**'s purpose is to internationalize all safety fields, including occupational and environmental safety and health, accident prevention movement, etc., and to disseminate throughout the world the practices skills, arts, and technologies of safety and accident prevention.

**WSO**'s objective is to protect people, property, resources, and the environment on local, regional, national, and international levels. WSO membership 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.

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# **Table of Contents**

	Pages
Workplace Health and Safety Investment and Good Business Performance	
Thi Thanh Tam Nguyen (Susan)	
Behaviour Based Safety for Corporates Dr Kaila Harans Lal	
What is Considered an Effective Health and Safety Committee? Tanya Harrinton	9-12
Examining Mental Health in the Workplace Samira Yusuf	13-16
Return to Work after an Injury Emma Crees	17-21
Relationship between Good Business Management and Occupational Safety and Health Tamara Clifford	
Is Education and Training Required for Workplace Safety? Dr Janis Jansz	27-36
Combating Road Traffic Congestion in Beirut, Lebanon Dr. Elias Choueiri, Mireile Choueiri, Dr Georges Choueiri	

# **Article Submission**

Articles for inclusion in this journal will be accepted at any time; 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 11 point. Articles should have an abstract of not more than 200 words. Articles shall be submitted as Times New Roman print 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, current employment position, a brief bio, and a photo of the author. 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 <u>Publication Manual of the Ameri-</u> <u>can Psychological Association 2017</u>.

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.

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> Submissions should be mailed to: WSO World Management Center Attn: Editorial Staff / Dr. Janis K. Jansz PO Box 518, Warrensburg, MO 64093, USA or emailed to: j.jansz@curtin.edu.au

Articles, wherever 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.* 

## An Invitation from the President/Director General of the World Safety Organization

Engr. Alfredo A. De La Rosa, Jr.

WSO President-Director General; WSO Board of Directors; Director, WSO International Office for Philippines.

On behalf of the WSO Board of Directors and the WSO Executive Action Committee, it is my privilege and pleasure to invite you to attend the 33rd WSO International Environmental and Occupational Safety and Health Professional Development Symposium.

The 33rd symposium will mark the 45th year of WSO in the international scene, and we are very proud to be able to successfully host it again in Las Vegas, Nevada, with all of you. You have all chosen

to be a part of our organization because of our mutual passion for the safety and accident prevention and the protection of our environment. Your passions help us all to come together as one, and the energy we create as one allows us to achieve our individual as well as organization's goals.

Meeting safety and environmental professionals from all continents, seeing old friends and meeting lots of new people and making new friends along the way, the 2019 symposium proved to be memorable and fulfilling as always. Here at WSO we value and cherish the friendships we make as they more often than not prove to be formed on a strong common ground which in turn makes them last for many, many years to come.

The 2019 theme was "Professionalism and Excellence

for the Future." To be a professional requires commitment. Commitment requires courage, moral courage, or fortitude if you will. Without fortitude, integrity will fail, and when integrity fails, professionalism is gone. As safety professionals, practitioners and advocates, we need to strive for excellence – not perfection, but excellence.

Excellence differentiates

extraordinary people from ordinary people. Those who strive for excellence will have longevity in their



alendar!

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255 East Flamingo Road Las Vegas, Nevada, USA endeavors. It is both the yardstick and the benchmark. When you benchmark to other achievers, you tend to improve and grow. As WSO members and as safety professionals, we want to excel in our chosen field of endeavor in the field of environment, health and safety.

As your new President-Director General, I am the next link in a chain of dedicated safety professionals who have served as President-Director General of WSO, a chain that reaches back to 1975 from Dr.

Emiliano Camarillo, Dr. Glenn Hudson, Dr. Peter Leggat, David Day, Dr. Vlado Senkovich, and to our beloved Edward E. Hogue. While I hold this torch, I pledge to continue the important and valued work of those distinguish safety professionals that came before me. I will represent the WSO with the best of my ability, I will foster and encourage growth on the WSO memberships, WSO Professional Certifications, support to the Sustainable Development Goals (SDGs) of the United Nations, national and international activities of our extraordinary organization of dedicated safety, health and environmental professionals, practitioners and advocates, and I will personally be of service to as many members as I am able.

Thank you again for the faith you have placed in me, and for the privilege to serve as your President-

> Director General in the 45th year of the World Safety Organization. I welcome your thoughts, your suggestions and your opinions. Together with our new Vice President-Deputy Director General Perry L. Ballard and the WSO Board of Directors, I will do my best for you, for our vision, and for the legacy and future of the World Safety Organization.

Thank you all, and let us

continue to "Make Safety a Way of Life ... Worldwide."

### Workplace Health and Safety Investment and Good Business Performance, with Perspective from Small to Medium-sized Enterprises

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#### Abstract

For many decades, although investing in work health and safety has been demonstrated to play a vital role in increasing business productivity and ensuring sustainable business performance by researches, organisations often underestimate the advantages of effective work health and safety system. By analysing relevant published literature, this article aims to assess not only short-term but also long-term benefits of work health and safety management, reveal the impacts of work health and safety failure on organisations, and highlight the importance of good business management to work health and safety.

**Key Words:** Safety management, Short-term benefits, Long-term benefits, Work health and safety failure, Business management, Work health and safety investment, Small to medium- sized enterprises.

#### Introduction

Enterprises often fail to appreciate the shared advantages between effective safety management and good businesses. According to Safe Work Australia (2014), organisations usually look at a net economic benefit that involves increasing employee productivity, reducing accident compensation, presenteeism, absenteeism, and other costs associated with return-to-work procedures, before committing to invest in better work health and safety (WHS) system, without considering other business intangibles including customer loyalty and sentiment, reputation, and brand images. This article analyses both short-term and long-term advantages of WHS investment and explores the causal relationship between sufficient WHS management and good business outcomes, specifically in case of smaller enterprises.

#### Methodology

An initial search was conducted using Curtin University Library Databases including ProQuest, ScienceDirect, Informit and Pubmed, with keywords "safety" and "business management", which yielded 2,656,582 publications. Subsequently, the function of advanced search was used to refine data published in the last 20 years, reducing the results to 2,390,570.

An additional Google search was carried out using keywords "good business" and "safety management". The process led to 1,180,000,000 results, in which some of them links to international organisations (e.g., European Agency for Safety and Health at Work, Health and Safety Executive in the United Kingdom) and Australian government agencies such as Safe Work Australia, Work Safe Queensland, Work Safe Victoria, Safe Work New South Wales. Further searches were conducted for more information about specific benefits of WHS system by using "shortterm", "long-term" keywords based on the results released. The keyword of "small business" was subsequently applied to narrow the results to a more particular context.

As a result, 30 publications were considered in total for the literature review based on the relativity and suitability to the core objective of the article, in which 22 are journal articles, four are government publications, two are books, and two are reports from international organisations.

# Discussion Consequences of WHS failure in Australian context

According to Australian Bureau of Statistics (2018), among a total of 13.4 million workers in 2018, there were 563,600 (4.2%) people who experienced a work-related injuries or illnesses and 190 fatalities occurred (Safe Work Australia, 2018). For the first 8 months of 2019, 83 workers have been reported killed at work (Safe Work Australia, 2019). In 2012-2013, the estimated cost of work-related injury and disease represented 4.1% of Australian GDP (\$61.8 billion), which had risen from \$34.3 billion in 2000-2001 (Safe Work Australia, 2018). On a less disastrous scale, the costs of WHS failures are usually examined as direct costs associated with increasing insurance premiums and compensation claims (Rikhardsson & Impgaard, 2004).

The Health and Productivity Institute of Australia (2018) estimated the claim compensation cost to be more than \$1.1 billion annually. However, it is argued that the real figure is likely to be much higher than such estimation due to the underreporting of incidents, uncompensated injuries or illnesses, and hidden costs (Rikhardsson & Impgaard, 2004). Organisations also have to face indirect costs when failing to maintain their WHS system, which have been described as production lost time and delays, litigation expenses and fines, sick pay, temporary labor replacement costs, additional wage costs, and repair to equipment and plant (Bevan, 2010). Even when there is no fatalities or incidents

occurred, Right Management (2009) stated that organisations with poor WHS performance are four times more likely to lose talents due to low levels of employee engagement.

Benefits of effective WHS system – The importance of focusing on long-term performance of WHS system Kaplan and Norton (2001) suggested that organisations often employ a 'balanced scorecard approach' when assessing the derived value from making a certain investment choice. However, such over- reliance on financial scales actually measures the results of past actions, hence it is considered to be inherently backward looking (Kaplan & Norton, 2001). Consequently, it could be geared towards encouraging the sacrifice of long-term value for a short-run performance (Kaplan & Norton, 2001), as many studied have demonstrated that the attempt of most investments into WHS is to obtain short-term outcomes rather than other substantial long-term gains (Ozminkowski, et al., 2002).

In their article, Kaplan and Norton (2001) emphasized that the intangible asset value of WHS system is generally indirect, contextual, potential, and bundled. While many researches often evaluate the direct links between firm productivity outcomes and WHS investment, much of the value is gained from a healthy and safe workforce through 'cause and effect' relationships (Safe Work Australia, 2014). Moreover, the safety performance measurement system is considered to be unhelpful, since it is regressively orientated by assessing WHS based on a record of accidents such as accident rates, workers' compensation claims, and frequency of lost time injuries after they have happened, and often fails to report near misses and recognise potential WHS outcomes (Mohamed, 2003).

Therefore, in terms of WHS, it is crucial for busi- nesses to connect intangible assets to other tangible ones in order to create the actual value from a balanced score- card perspective (Kaplan & Norton, 2001). This process involves imposing WHS interventions to increase efficiency and productivity, promoting WHS results to attract and hold back talents (Right Management, 2009), to protect and improve reputation (Neumann, Dixon & Nordvall, 2014), and to leverage practices in the workplace to promote products and services (Lamm, Massey, & Perry, 2007). Mohamed (2003) suggested that the implementation of a more holistic balanced scorecard approach significantly contribute to organisational performance by reducing cost and increasing productivity and quality.

In a study carried by Lahiri, Gold, and Levenstein (2005) in US automotive and wood processing plants, significant improvements in workplace productivity were reported following a number of WHS practices' implementation.

Similarly, Dejoy Della, Vandenberg and Wilson (2010) described a notable development in sale performance in the intervened group of stores over the control one. In different national conditions (e.g., Spain (Abad, Lafuente, & Vilajosana, 2013), the United States (Lo, Pagell, Fan, Wiengarten, & Yeung, 2014), and small and medium businesses in Portugal (Santos, Barros, Mendes, & Lopes, 2013), it is reported that there were remarkable performance outcomes associated with the application of OHSAS 18001 certification. Using a larger sample of 455 Spanish enterprises, Fernander-Muniz, Montes-Peon, and Vaquez-Ordas (2009) affirmed a positive relationship between firm performance measures (e.g., competitiveness, safety performance, and financial performance) and a comprehensive WHS system implementation.

#### Good Business Management and WHS Administration -The Key Role of Leadership

The position of Occupational Health and Safety Advisor plays an important role under Australian legislation (e.g., Occupational Safety and Health Act 1984, Occupational Safety and Health Regulations 1996, and Western Australia Codes of Practice in Western Australia) in order to ensure health, safety, and wellbeing of workers and workplaces. Although WHS management role has been recently introduced over a few decades, it is supposed to have no inherent differences to other management positions at a functional level, with the fundamental principles of planning, organising, leading, and controlling (Archer, Borthwick, Travers, & Ruschena, 2012). Among those listed factors, leadership is perhaps the most critical element, as it highlights the specific role of manager of influencing how WHS practices are applied and integrated into procedures that drive performance and production (Safe Work Australia, 2014).

However, Linhard (2005) demonstrated that managers generally perceived WHS processes as a required expense to avoid legal penalty, rather than representing a profitable investment. Such perception hence creates several impacts on WHS administration and organisation performance, since the behaviour of management has been showed to play a significant role in shaping employee behaviours and their perceptions of risk (Safe Work Australia, 2014). An investigation conducted by Michael, Evans, Jansen, and Haight (2005) demonstrated that worker perceptions of management commitment to safety were associated positively with job satisfaction, job performance, and commitment and negatively with employee withdrawal behaviours.

Similarly, Geldart, Smith, Shannon, and Lohfeld (2010) carried out a study which determined the association of

the reduction in lost time frequency with the deployment of WHS measures and policies, the involvement of em- ployees in decision making, and more favourable manage- rial attitudes towards WHS. In a meta-analysis of over 50 studies evaluating the relationship between injuries and safety climate, Beus, Payne, Bergman, and Arthur (2010) also suggested that management commitment to WHS is the most powerful predictor of occupational injuries, which outlines the connection between leadership styles and behaviours, and WHS outcomes.

# Small and medium-sized enterprises (SMEs) and WHS management

While any business can face a financial disaster in case of a serious WHS incident, SMEs usually feel a much greater extent resulted from inadequate WHS interventions due to the less resources secure to pay fines and litigation costs, replace key personnel, and cope with interruptions (Safe Work Australia, 2014). Brook (2008) indicated that although Australian SMEs appear to outperform larger operations on limited injury data, this estimation could be misleading because of the under-reporting of workplace injuries among small enterprises. One of the reasons for this issue is the unique social relationship that exists between workers and employers in small businesses (MacEachen et al., 2010). Such close-knit working relationships allow employees to acquire an intimate appreciation towards the financial position of the organisations, which foster empathy among workers and therefore lead to a greater tolerance of workplace hazards and insufficient WHS investment (MacEachen et al., 2010). Cagno, Micheli, Jacinto and Masi (2014) indicated that occupational accidents in smaller enterprises not only occur more regularly but also result in more critical consequences than in larger firms.

This is due to the fact that there are often higher frequencies of ergonomic, chemical, and physical hazards in small business workplaces (MacEachen et al., 2010), and workforces in such type of firms are usually younger, less experienced and less educated (Champoux & Brun, 2003). It is also demonstrated that SMEs often provide less training than larger firms, specifically in the WHS area, and less likely to adopt workplace safety programs or workplace health promotion activities (McCoy, Stinson, Scott, Tenney, & Newman, 2014).

There are a variety of factors that contribute to the lack of WHS adoption and investment within small businesses. Firstly, compared to larger organisations, SMEs are believed to have lack of human, economic, and technological resources to invest in and effectively manage sufficient WHS systems (Cagno, Micheli, Jacinto, & Masi 2014). Besides, the uncertainty around return on investment and production pressures also suggested to play cru-World Safety Journal Vol. XXVIII No. 4 | 2019

cial parts in poorer WHS practices adoption and outcomes associated with small enterprises (Chapman et al., 2008).

#### Conclusions

Although many operations still focus on a more financial balanced scorecard approach and underestimate the advantages of sufficient WHS system, evidence from published literature consistently supports the association between WHS interventions and both short-term performance measures and intangible business assets in a long run. The position of leadership in terms of WHS plays a significant role in good business performances, since WHS management commitment has a huge positive impact on enhancing safety climate in the workplace, hence reduce cost and improve business productivity. An additional emphasis of adequate WHS system should be put into small to medium-sized enterprises, as the WHS performances in such type of operations is significantly poorer compared with larger firms, while there is the greater chance for them to face more disastrous financial and organisational consequences in case of serious WHS incidents.

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#### About the Author

Thi Thanh Tam Nguyen (Susan) is in her penultimate year studying Health, Safety, and Environmental Health at Curtin University, Western Australia. Her passion about work health and safety has been consistently demonstrat-

ed over a 6-year period of occupational health and safety education. Coming from Vietnam, one of the most dynamic emerging countries in South East Asian, Susan desires to contribute to the health and safety goals in every workplace. Her first and foremost aspiration is to help everyone to return home safely at the end of a working day, by effectively engaging with key stakeholders in order to identify any existing or potential risks and eliminate or minimise them with the most favourable control measures, encouraging safety culture, and create a happy and healthy workforce.

## Behaviour Based Safety for Corporates: A Shift toward an Interdependent Safety Culture

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#### Abstract

Indian corporates are one hundred percent safe as per their safety documents and records, but much lacking in behavior. Hence their safety certifications and awards are questionable, as well as the certification agencies also can be questioned. This article brings forth the brief reporting of Indian organizations that implemented behavioral safety during 2019, so that behavioural safety aspects can be incorporated and emphasized by the corporates and agencies.

Key Words: Implementation, Behaviour, Industry, Safety Culture, BBS

#### Introduction

It is quite obvious and evidenced that the reactive safety culture and the dependent safety culture are not protecting industry from small or major incidents. It has become essential to move to the independent and interdependent safety cultures. The financial losses that are due to industrial safety incidents are controllable, as almost all incidents are behaviour-based. There is a need to follow a simple and scientific behavioural based safety (BBS) application that is outlined in this article. Empowering one and all till the last person at site - for "daily observation and spot-correction" through BBS implementation is referred as BBS standard procedure (Kaila, 2019).

Safety management means being reactive and documentation. Change in safety culture is much needed and can be achieved through BBS implementation. There are four categories of organizations with regard to behavioral safety implementation. The first, that consider only training, the second, that thinks that safety is a cost to company, the third, that choose implementation process for long term benefits, and the fourth, that implemented BBS but did not continue for some organizational reasons, and then rejuvenated it after a while. Obviously, the first one and the second category of organizations don't achieve any difference with regard to their safety culture, as their focus is not implementation of behavioural safety program (Kaila, 2017).

If BBS implementation is left only in the hands of safety departments this generates a dependent safety culture where incidents keep happening. BBS implementation aims to build an interdependent safety culture by making it essentially each department's safety objective for reaching a common goal of zero-harm at site. According to the Head - QHSE of Tata Projects, BBS is the heart of getting Process Safety right.

This article covers the following aspects of the organizations in BBS implementation.

- 1) 2nd year of BBS Journey at Sembcorp Energy India Limited
- 2) BBS score board of DCM Shriram
- 3) Raurkela Steel plant
- 4) BBS Review points
- 5) Galaxy Surfactants BBS practices
- 6) Conclusion and Implications

There are 3 stages in BBS Implementation:

1st Year – Introduction of BBS concept to all manpower.

2nd Year – Reinforcement and attaining maturity for daily observation and spot-correction.

3rd Year – Sustaining the spot-correction culture.

#### Action Plan for 2nd Year

- 1. Road Safety to be included as 10th Behaviour in the checklist, to be tracked.
- 2. Area-wise BBS Scoreboard Display post concurrence of HODs and Line Managers
- 3. Schedule of Development and Nurturing of BBS Observers. Each Employee becomes Mentor to develop observers.
- 4. Sharing of Daily Observations by Observers in Tool Box Talks and with Department Co-ordinators and Co-Observers.
- 5. Display of Checklist at all Work Locations & with message "BBS is Observation and Spot Correction as Big Brother."
- 6. HODs to mentor BBS project in the respective departments.
- 7. Each HOD makes an observation [3 min. minimum] and spot-correction every day
- 8. HOD to analyse Departmental BBS Data and take corrective actions
- 9. Circular from BU head BBS implementation by all employee. [PKR to send draft]
- 10. Safety Induction to include BBS and how to make BBS Observations
- 11. Signage at Main Gate "Seat Belt Saves Lives Ensure all at Front Seat and Rear Seat are wearing Seat Belt"

- 12. While BBS Observations, no one is Senior and Junior. It applies to everyone.
- 13. BBS to be taken to Homes, Communities and Schools.
- 14. Quarterly Reviews to be organised with Steering Committee and Dr. H.L. Kaila.
- 15. Observations Focus to move from PPE to Safe Working SOP.
- 16. Weekly Departmental Observers Meeting with Co-Ordinator.
- 17. One 5 minute BBS Video to be prepared for SEIL.
- 18. Everybody spends 3 minutes (minimum) for observation per day. Time, Duration, and Area of Audit to be included in Observer Sheet.
- 19. Self-Correction is must. Everyday take time to think:
  - What unsafe actions I did
  - What Unsafe Acts I allowed to happen or passed by without correcting

#### **BBS Score Board of DCM Shriram**

All behaviours were spot-correctable which were witnessed and recorded in the following table (BBS Score Card, at right). As a result of daily observation and spotcorrection by the observers trained in BBS approach, safe behaviours went up to 100 percent.

The first BBS Steering Team Review meeting was held and the following points were discussed:

- 1. Are BBS observations being incorporated regularly by all sections & departments.
- 2. That BBS observations file was introduced by the Process Department and the Cane Department. This effort was appreciable and hence was decided all other sections and departments were to follow the same procedure.
- 3. Culture for no use of mobile phone during work at height was developed and further strengthened.
- 4. All members shared their experience of BBS implementation for last one month. All appreciated the efforts of their colleagues for incorporating safety culture within the organisation.
- 5. Efforts were made by all to capture the BBS observations with zeal & team work.
- 6. BBS score card is in the next column for reference

#### **BBS at Raurkela Steel Plant**

Rourkela Steel Plant (RSP) has been making all out efforts to become an accident-free Steel producing unit in India. Recently 'Sankalp – A new Safety Intervention,' was started to strengthen the safety initiatives at RSP through Behaviour based Safety (BBS) model. As a part of it, a massive two-day campaign named as "Bhai-Bhauni, Bandhu Suraksha," was launched on 27th May

2019. The CEO inaugurated the campaign at HRD Centre which was conducted by a renowned behavioral scientist.

Base level of Behavioural Data Score Card				
S.no.	Departments/sections	No. of safe	At-risk	Spot
		behaviours	behaviour	correct
	D II	25	5	6
1	Process House	20	0	0
2	Boiling house	27	6	5
3	Mills	15	5	5
4	EHS	126	35	35
5	Boiler	666	48	48
6	Electrical	22	14	14
7	Accounts	8	2	2
8	Sales	4	2	2
9	Instrumentation	40	20	20
10	Material	7	3	3
11	Laboratory	15	7	7
12	Sugar Godown	20	6	6
13	Security	20	6	6
14	Cane	4	2	2
15	ETP	104	50	50
16	HR & Admin	12	6	6
17	Civil	12	5	5
18	ITS	25	10	10
		1152	233	232
	% safe	83		100
	%at-risk	17		
	% spot-			
	correction	100		
	Final		Interde- pendent	
	Improvement	100	Safety Culture	

A field visit was organized in which around 50 Departmental Safety Officers, Area Safety Officers and personnel of the Safety Department made observations on the behavioral pattern of the employees of the plant with the help of the BBS Observation Card. This was based on the conceptual input provided. The findings of this session were analysed and another session was held to chalk out an implementation strategy. The nine areas of employee behavioral concerns that were zeroed in on were: Personal Protection Equipment (PPE), housekeeping, using of tools and equipment, body positioning, material handling, verbal and nonverbal communication, attentiveness and use of mobile phone while working. The eight-pronged strategy finalized to address these issues included parikrama (going around), prashna (question), Prashansha (praising), parivartan (conversion), prashikshan (training), pratigya (pledge), prachaar (teach) and prarthana (request). This interaction was followed by a motivational session that was attended by around 450 employees from across the plant including senior officers. An emphasis was laid on right observation, spot correction and spot reward. Stress was on the concept of moving from awareness to alertness.

#### **BBS Review Points**

The tool with the following questions and points was used in the workplace for the assessment.

Has your safety cultural change slowed down? If so please review the BBS processes checklist below. Mark each process below out of 10 and then check what's lacking (Kaila, 2018).

- 1. Safety cultural shift from reactive, dependent culture to independent, interdependent culture
- 2. Leadership increased involvement
- 3. Monthly BBS meetings
- 4. Incidents reduction
- 5. Behavioral trends improvement
- 6. Sharing of at-risk behaviors during tool box talks (TBT).
- 7. Motivational reward, recognition for observers/ units
- 8. Managements regular observation rounds
- 9. Regular repeat BBS awareness sessions for spotcorrection
- 10. Quarterly reviews across units/ sites

Total: 10x10= 100 Your score:

An organization's vice president shared as to why BBS approach failed or slowed down with the main reasons being:

- BBS documentation was cumbersome;
- Trained BBS observers left the organization;
- Training and retraining of employees on BBS didn't take place;
- Cross-function teams were not involved,
- It was driven by HSE department instead of the CEO.

#### **Galaxy Surfactants' BBS Practices**

Galaxy implemented BBS in January 2019 and found a significant change in its safety culture. It observed the following practices.

- a) The Blank BBS checklist box, and the filled-in checklist box were kept at the Main gate
- b) Have you done BBS today? this message came daily on all employees' mobile phone in order to rein-

force observations of at-risk behaviour and its spot-correction.

- c) BBS trained safety officer was invited to visit neighbouring units for BBS awareness sessions
- d) Instead of just sharing numbers in BBS monthly meeting, members started sharing quality difference in the standard operating procedure (SOP) before and after BBS implementation.
- e) Linking monthly observation matrix with individual variable pay, so that each employee is encouraged to make observations. Substantial weightage is to be given to BBS observation and spot-correction in employees' key result areas (KRA).
- f) Overall Enterprise reported incident rate is declining but needs significant improvement.

#### **Conclusions and Implications**

Some basic aspects in the management of safety behaviours need to be dealt with:

- a) a) no corporate completely gives up on punishment practice,
- b) b) during serious level audits, the managements temporarily suspend activities of risky contractors and resume them after the audits,
- c) c) production pressures obstruct safe practices, and many of the companies conduct BBS training to fulfil their client's obligations and requirements, not to sustain it in future.

Secondly, an organization that fails to take a scientific approach to safety's human-behaviour element is gambling with their futures and is ultimately only safe by accidents. Behaviour Safety is a statistically meaningful improvement of the Safety Performance in the Workplace. ISO 45001 emphasizes that all companies should measure their organization's risks and capacities for controlling those risks. Spot-correction lies between the observer and the accident that can save the human life as well as the business.

Moreover, the BBS approach does not encourage safety in certificate rather in behaviour of people. A company can have 100 percent safety practice in documents, but safety lacking in behaviour. How to tackle this issue? It is the behavioural aspect that need to understanding in BBS implementation which is essentially a cultural shift experience of industries across the country. There is a need to linking monthly observation matrix with individual variable pay, so that each employee is encouraged to observe more than one at-risk behaviours and spot-correct the same within less than 5 minutes each day (Kaila, 2019).

It is important to note the plight of a Safety Head that the incident investigation and management must focus on behaviour and observers of the concerned departments, sections, area operators, and not to hold safety Secondly, BBS departments responsible. the observations need to be linked with variable pay, promotion, increments, and not to consider promotions in departments where the incidents took place. When people are promoted who don't have incident free records in their department, this indicates a wrong message to others who maintain best safety practic- es. This means the departments to take responsibility of daily observations and spot-correction of at-risk behav- iours.

Quite often, organizations reach about 95% of safe behaviours, thereafter, find it difficult to go beyond that level. In this regard, all HOD must take responsibility of activating their observers for spot-correction each day, and daily sharing of observations-cum-spot-correction must take place in respective departments, in order to move from dependent safety culture to an interdependent safety culture. Dependent safety culture is dependence on safety department staff and management actions, which does not give a total safety culture. The number of unsafe observations will start reducing when all HODs take responsibility and shift from dependent safety culture to interdependent safety culture. As long as HOD is not involving actively in BBS activities, the observers of those areas also remain inactive. That's the basic reason, the HODs are part of the BBS steering team at site. And regularly monthly meeting of the steering team is held to review and support BBS progress. According to Vice President of Tata Projects, it's all an agenda best driven by the HODs. Workplace is Safe when at-risk behaviours are 100% corrected each day, and each area observers are active for spot-correction.

An observation a day, keep the risk away. An observation is an early warning assessment for spot-correction by an observer. BBS is 100% spot-correction of all at-risk behaviours daily before leaving the site by the teams of trained observers and by developing observers down the level in each of the work areas. According to a Vice President – HSE, "Now we have a well-trained big team of thirty four BBS observers at Mundra. Let us utilise the inputs from this training, carry out BBS observations, do the spot corrections of at risk behaviours for creating the Interdependent safety culture. It should be a continuous journey towards achieving a goal of Zero Unsafe Behaviour and Safety Excellence in Dorf Ketal.

This article would prove to be useful in providing guidelines for behavioural safety aspects to be incorporated by corporate and safety organizations.♦

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### What is Considered an Effective Health and Safety Committee and How Can Health and Safety Representatives Contribute to the Overall Success of the OSH Committee?

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#### Abstract

An effective Health and Safety committee is one that involves employers and employees working together in a consultative and collaborative manner to resolve health and safety concerns. The committee should include Health and Safety representatives whenever they are elected by their employees. Health and Safety representatives are a conduit for management to the broader workforce and including them in a committee plays an important role in meeting the consultation requirements. Health and safety representatives are generally engaged with safety issues and make valuable contributions to Safety committees. High functioning Health and safety committees are proven to be effective in reducing injury and safety incidents.

Key Words: Health and Safety Representatives, Safety Committee, Workplace, Effective.

#### Introduction:

Establishing a Health and Safety committee is a legal requirement in certain circumstances. In Victoria the legislation requires an Occupational Health and Safety Committee (OSHC) to be established within 3 months of the Health and Safety Representative (HSR) requesting it (The ACT, 2004). This shows the influence a HSR has in relation to Occupational Health and Safety Committees. Whilst the legislation that dictates when a committee needs to be established varies across legislative jurisdictions, it is widely accepted that Occupational Health and Safety Committees (OSHC's) have a positive influence in relation to the reduction of workplace risks and associated injury and illness (Safety Matters, 2012). It is because of this wide held belief that it is rare, in some industries, to find an organisation without an OHSC even if it isn't a legal requirement to have one (Ndana, 2018).

Health and Safety committees are a foundation for employee and management engagement and are a critical communication forum (Presswire, 2012). They facilitate a teamwork approach to safety and can reiterate that safety is everyone's concern in the workplace (Presswire, 2012). This literature review shows an effective OHSC will engage employees and management on safety issues and encourage people to voice their safety concerns and provide support and resources to those that do. They also ensure issues raised are given genuine consideration and that appropriate resources are made available to resolve the matters raised at the committee level (Saskatoon, 2014).

This review clearly highlights that establishing a committee is an important first step to improving safety outcomes however this in itself isn't enough. It cannot be assumed your job is done because you have a committee (Kolman, 2009). The committee must have a clear purpose, have appropriate commitment and resources available. It must also be founded on mutual consultation and be truly collaborative (Horan, 2013).

#### Methodology:

In an attempt to define what a successful Health and Safety committee is and how Health and safety representatives impact on those outcomes a literature review was carried out. The ProQuest Database was the only databased searched. Using the keywords Health and Safety Representatives AND Safety committee AND Workplace AND Effective, 111,722 results were returned. The search was limited to full text articles and peer review journals published between 2009 and 2019. Articles were chosen or disregarded based on the number of keywords in the summary and the reading of the abstract. A total of 16 journal articles and 3 publications were used in the review. Further searches were done using google to obtain the relevant legislation and guidance material and included a search of the WorkSafe Victoria website.

#### Limitations:

A single database, ProQuest was used to search for literature. This may have limited the amount of articles available. The search result did yield a high number of articles, 111,722 in total. Only a small number of articles were selected and reviewed meaning the sample of literature reviewed is quite small. Some of the literature references Health and Safety committees in countries where the legislative requirements are different. This appears to impact the requirement of when to establish a committee and not the functionality of the committee however this matter was subjected to limited review.

#### **Elements for an Effective Committee**

#### The Committee Structure

The structure of a committee is a critical factor to how well the committee functions and the influence it has on safety outcomes. The committee is an effective way for employers and employees to consult on safety issues and to collaborate on policies and procedures (WorkSafe, 2006). Engaging the right personnel will ensure the collaboration is effective. The right personnel should include members of senior management who clearly demonstrate a commitment to the process and respects the role of committee and its members (Horan, 2013). The committee must be at least half represented by employees and the employees should be Health and Safety representatives [The Act, 2004. s.72(3)].

#### **OHS Training**

Health and Safety representatives have a right to be trained and employers must facilitate the training by providing time for the courses to be undertaken as well as covering the costs of the training (The Act, 2004. s.69 (1)). Studies show HSR's that have completed safety training are better equipped to represent their fellow workers and make meaningful contributions to the consultation that occurs at committee level (Woodhouse & Gordon, 2010). Training should include matters of debate and decision making as well as general health and safety issues (Canadian HR Reporter, 2009). Training on effective communication and efficient meetings is also beneficial (Kolman, 2009).

Upon completion of formal training representatives feel more confident to speak up about safety issues and are more confident in identifying hazards and associated risks (Bryson, 2011). The HSR's are employees of the organisation and have an inherent understanding of these issues, perhaps more so than mangers, and are a useful management tool in regards to consultation with the broader workforce (Wadsworth, Bhattacharya, Walters, 2015). Workers will be more inclined to discuss safety concerns with an employee elected representative than with management (Woodhouse & Gordon, 2010).

#### **Worker Involvement**

Not only is it a legislative requirement to involve workers in an OHSC it is good practice to utilise their skills and knowledge in a collaborative manner. Workers are at the frontline in terms of exposure to hazards and risks so not only are they better equipped to identify potential safety issues, if they are engaged and participating in positive health and safety behaviours it is beneficial for the company and the employees (Pashorina-Nichols, 2016). When this is done effectively studies have shown that this leads to a significant reduction in injuries, a reduction in absenteeism, increases in reporting of incidents, reduced labour costs for the company and an improved safety culture throughout the organisation (Bryson, 2011). Bryson (2011) goes on to conclude that an OHSC that actively engages with the employees can decrease accident rates by as much as 50%.

The positive impacts this type of collaboration demonstrates comes from the fact that employees and employers share common ground when it comes to safety and should therefore share the responsibility of making safety decisions (Facey, MacEachen, Verma, Morales, 2017). Where health and safety goals don't align for employees and employers the outcomes are vastly different (Wadsworth et al., 2015). It has been demonstrated that where employee engagement is not a focus of management and power imbalances exist between the parties, the safety outcomes are adversely affected (Wadsworth et al., 2015). Workers in these situations continuously reported having no platform to raise OHS concerns, having no employee elected representatives to consult, actions arising from the OHSC's was limited and in some instances workers report not knowing a OHSC existed (Wadsworth et al., 2015).

The companies that prioritised Health and Safety representative involvement also tended to prioritise safety. These companies utilised the skills and working knowledge of the representatives In the bigger picture safety aspects such as planning, hazard and risk identification and accident investigation which created a collaborative environment based on trust and respect. This again showed marked improvements for safety outcomes (Rasmussen, Hasle & Andersen, 2014).

#### Management Commitment to the Committee

Management commitment to the safety committee is paramount to achieving real and positive safety outcomes. Management need to not only be active participants in the committee but they need to be visible as safety leaders across the business. They need to be prepared to listen to the voices of the committee members and to take action on the matters raised (Canadian HR Reporter, 2009).

An effective committee will consist of management from across the organisation. It will include senior management with the authority to make decisions as well as safety leaders and line managers. This demonstrates an organisational wide commitment to safety and leads a strong safety culture (Ndana, 2018). When employees see management have a strong safety focus it will encourage incident reporting and safety conservations (Ndana, 2018). The literature reviewed clearly demonstrated one of the biggest failings of an OHSC was manager attitude. This often manifested by managers presenting to meetings because they were instructed to, not because they had a mandate for change or a desire to create change (Facey et al., 2017). These managers would set meetings at inappropriate times when safety representatives weren't available. This might be during peak times of a shift or after hours. This was often a deliberate attempt to remove safety representatives from the discussions (Facey et al., 2017).

Some organisations view a safety committee as a compliance issue and therefore will appoint personnel to attend but with no mandate or agenda for what to do. Managers have no role outside of the committee. That is, they have no authority to implement change and have no resources available to follow up committee ideas. These committees are ineffective in reducing injury rates and are often considered as not real safety work (Facey et al., 2017). In some circumstances managers take a view that representatives who raise safety concerns are trouble makers. This restricts open communication and likely has an adverse effect on safety outcomes (Facey et al., 2017).

Senior representatives should encourage representatives to bring forward ideas and suggestions. They should promote individuals asking questions, raising concerns and offering solutions (Kolman, 2009). Managers are ultimately responsible for the safety outcomes as far as they make the decisions about what resources will be made available and what degree of investment will be made, so they should use all of the knowledge and skills available to them (Kolman, 2009).

#### **Functions of a Committee**

The functions of the committee are legislated however they are broad in their application (WorkSafe, 2006). These functions include facilitating a co-operative approach to occupational health and safety between the employer and the employees and formulating and reviewing procedures [The Act, 2004. s.72(3)]. Guidance material is provided to help an organisation establish an effective committee to meet the legislative requirements. The guidance material suggests the committee establish via consultation agreed objectives of the committee, review and consider injury statistics with a view to recommend corrective action, monitor and review all relevant safety reports, develop meeting schedules and publish this information in advance and create an agenda for each meeting with responsibilities for committee members (Worksafe, 2006).

The size of the committee is a point that needs careful consideration to ensure it is functional. Whilst no defini-

tive number is prescribed, it is widely accepted that the committee should consist of equal numbers of employees and management (Worksafe, 2006) and each department within the organisation should have a representative (Safety Matters, 2012).

Meetings should be held in company time to ensure availability of all members (Safety Matters, 2012). In addition management who participate must be able to approve expenditure and set accountabilities for committee members (Safety Matters, 2012). Training of committee members is a significant factor in terms of the committee's ability to function effectively. Members should be trained in health and safety matters, their role and responsibility on the committee as well as training on effective meeting procedures (Worksafe, 2017). Each meeting should have a clearly defined agenda with the appropriate time allocated to ensure matters can be dealt with. The agenda should be forwarded to all committee members prior to all scheduled meetings, at least a week in advance, and the agenda should clearly highlight who has responsibility for action items and the progress of these items. This ensures accountability (WorkSafe, 2017).

#### Conclusions

Effective health and safety committees are built on respect, trust and collaboration. They exist in circumstances where organisations prioritise safety and senior management show a genuine commitment to improving safety outcomes. When managers and employees work together with a team orientated approach to safety, incident reporting increases, injuries and illness reduce, staff are empowered to discuss safety concerns in an open and transparent way and the overall safety culture of the organisation is improved. Effective Health and Safety committees include well trained Health and Safety Representatives that are passionate about safety and that of their colleagues. They effect real safety change and are valuable assets to an organisation. They have been proven to increase productivity and reduce costs.

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# Examining Mental Health in the Workplace: A Review on a Systematic Approach toward Preventing Work-Related Psychological Issues

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#### Abstract

Mental health issues are one of the main causes of absenteeism and long-term work incapacity in the Australian workforce. Work-related stress claims in Australia are the most expensive form of workers compensation with approximately 7,140 Australians compensated for work-related psychological issues between the years 2012-13 to 2016-17. There is an increase of costs in relation to work-related psychological issues in Australia. Research has shown that workplaces that place an importance on positive safety culture and implement mental health programs in the workforce benefit from increased employee productivity, reduction in employee absenteeism and reduced staff turnover.

**Key Words:** Mental health, Psychological issues, Work, Workplace safety, Work pressure, Intervention, Depression, Anxiety.

#### Introduction

The World Health Organization defines mental health as, being "a state of well-being in which every individual realises their own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community" (World Health Organization, 2014). Mental health is usually combined with pre-existing psychological issues such as deschizophrenia and pression, anxiety conditions (Productivity Commission, 2019). With approximately 13 million Australians in the workforce, work-related psychological issues have become a significant and growing problem in Australia, every year \$543 million is paid in workers' compensation for work-related psychological issues (Safe Work Australia, 2019). Work-related psychological issues have a possible impact on employees, organisations, social welfare systems, workplace health, compensation claims and the costs associated with absenteeism (LaMontagne et al., 2014). Several studies have proved workplaces that promote positive safety culture, protect the wellbeing of their staff, and supports staff with mental health conditions improves productivity of the employees, organisational performance and workplace health and safety (Worksafe, 2013). This paper discusses relationships between the workplace environment and psychological issues, whilst also identifying work related psychological risks. Furthermore, will also look at the considerable costs related to psychological issues imposed on Australian workplaces, followed by effective ways to improve and prevent psychological issues in the workplace.

#### Methodology

An initial literature review search was conducted using databases that included ProQuest, Science Direct, National Institute for Occupational Safety and Health and Pub-Med. Data was collected through peer reviewed journal articles, published within a 10-year time frame between the years 2009 to 2019. Key words 'Psychological issues in the Workplace' generated 162, 381 results, whilst more World Safety Journal Vol. XXVIII No. 4 | 2019 than 300, 000, 000 results were found on Google. Specific words such as 'mental health, workplace safety, work pressure and prevention' were utilised through using the advanced search option in order to further refine the search. Government websites that were used included Safe Work Australia, Work Safe, Productivity Commission, The Australian Institute of Health and Welfare and The Australian Bureau of Statistics presenting results such as Work-related Psychological Health and Safety and Mental Health in the Workplace highlighted a detailed analysis of work related psychological issues. Overall 24 studies were included in this review of published literature, with ten journal articles that provided seven case study examples ranging from mental health in the workplace, work related stress and the impact of psychological issues on workplace productivity.

#### Discussion

Mental illness is defined as a clinically diagnosable disorder(s) which substantially affects an individual's emotional, cognitive and social abilities (Australian Institute of Health and Welfare, 2018). Nearly a third (45 percent or 7.3 million) of the 16 million Australians aged 16-85 years had a mental disorder at some stage in their lives with one out of five Australians experiencing mental illness in any given year (Australian Bureau of Statistics, 2018).

The leading psychological issues seen in the workforce are particularly anxiety, post-traumatic stress disorder, burnout and depression, which while highly common are generally treatable (Chopra, 2009). Impairments in these areas can lead to increasing presenteeism and poor job performance and also have the possibility to expose employees with these symptoms to workplace failures and workplace accidents/ incidents (Hilton & Whiteford, 2010). Workplace accidents may involve significant costs to an employer from reduced manufacturing goals, medical/insurance costs, absenteeism and loss of goods or equipment (Hilton & Whiteford, 2010). Australian Workplaces spend approximately \$10.9 billion annually in mental health conditions costs (WorkSafe, 2019). This includes \$6.1 billion in presenteeism, \$4.7 billion in absenteeism and \$146 million in compensation claims (WorkSafe, 2019). The prevalence of psychological issues has a direct impact on the Australian workforce, with an average of 7,140 Australians compensated for work-related psychological issues (Safe Work, 2019). During the year 2011-12, 62% of working age Australians with mental illness were employed, in comparison to 80% without a mental illness (Department of Health, 2009).

In Australia individuals with mental health issues are recognised as being the most economically disadvantaged and socially marginalised members of the community (Schofield, Kelly, Shrestha, Callander, Percival & Passey, 2010). Unemployment rates are up to four times higher in people with a mental health condition due to hesitancy and being unable to join the workforce in comparison to healthy Australians (Schofield, et al., 2010).

#### **Costs of Work-related Psychological Issues:**

Over the previous 30 years, the mental health sector in Australia has faced important reforms, however, the prevalence of psychological issues and the considerable costs it imposes on both employers and their employees demonstrates that further improvements are needed (Mental Health Australia, 2018). This can be due to exposure to different hazards or factors in the workplace such as lack of support, high and low job demand, traumatic or violent events, work-related bullying and poor work environment (Safe Work, 2019). The cost of depression alone in Australian workers is projected to be \$12.6 billion annually and \$213.5 billion over an average lifetime (Productivity Commission, 2019).

The serious frequency claim for work-related psychological issues was 0.43 claims per million hours, the average compensation paid was \$24,500 and the average lost time was 15.3 weeks in 2014-15 (Safe Work, 2019). Workrelated psychological issues play a major role in negatively impacting the health and productivity of the individual and also their families and work colleagues (Safe work, 2019).

The 2018 KPMG along with Mental Health Australia report (Investing to Save) found that, work-related psychological issues costs an average of \$3,200 for employees with mental illness and up to \$5,600 for employees with severe mental illness (Parliament of Australia, 2019). Overall, the estimate cost of work-related psychological issues in Australia was \$12.8 billion in 2015-16 (Parliament of Australia, 2019). Although mental health issues are present in the community, there continues to be an increase of costs in relation to work-related psychological issues.

#### The Impact of Psychological Issues on Workplace Productivity:

Recognising the importance of the inter-relationship between psychological issues and productivity is complex (Chopra, 2009). Employees exposed to psychological issues may continue to work yet still remain unproductive due to personal reasons, workplace culture and stigma (Chopra, 2009). Workplace culture might also promote the perspective that psychological issues are a sign of individual weakness instead of recognising it as an interaction between the individual and his/her environment and also understanding the accessibility of treatments that are effective (Chopra, 2009).

Some employees might not realise that they are affected by depression or anxiety, and if they are they could be afraid of negative consequences if they communicate their condition to the employer, which results in the employee to lack motivation to seek support (Chopra, 2009). Employees that work with untreated mental illness do so with an illness that mentally, emotionally and physically impairs them (Goetzel et al., 2018). Several research studies have measured productivity losses due to psychological issues. For instance, research has proven that there are more workers absent from work due to psychological issues in comparison to physical injury or illness (Goetzel et al., 2018).

#### **Workplace Mental Health Interventions:**

Workplace mental health interventions are achieving acceptability as a way of preventing, managing and screening psychological issues faced by employees in different industrialised democracies (LaMontagne, D'Souza, & Shann, 2012). Such programs have expanded rapidly in Australia over the past several years, with Beyond Blue national which was launched in 2004 being the largest workplace program (Highet, Shann, & Young, 2010).

R U OK? Day is also another program which started in 2009 as national initiative aimed at bringing Australians together to prevent suicide by encouraging members of the community to have important conversations by asking "Are you ok?" (Mok, Donovan, Hocking, Maher, Lewis & Pirkis, 2016). Many workplaces, public organisations and schools across Australia participate in R U OK? Day (Mok et al., 2016). These programs generally strive to educate employees on how to recognise and react to employee mental health issues, work-related psychological issues, to better understand mental disorders as a treatable illness, destigmatise mental disorders and to develop the ability to assist a team member or supervisor in seeking professional assistance (Beyondblue, 2015).

Employee Assistance Programmes (EAP's) are another common workplace intervention that provides psychological support which is delivered by individuals from different proficiencies (Henderson & Harvey, 2011). The amount of organisations providing EAP's has increased, many employers implemented a counselling program when an English Appeal Court Ruling in 2002 proposed that providing a counselling service was likely to fulfil the obligation of the employer's duty of care (Henderson & Harvey, 2011).

A worldwide met-analysis has proven that mental health promotion programs can usually be good at minimising psychological symptoms in staff members, even though the impact is minimal (Beyondblue, 2015). Additional evidence on the method and efficiency of these programs in improving psychological issues will promote their further expansion and improvements (Beyondblue, 2015).

In addition to good work concepts and risk control, numerous measures can be taken to enhance the health and safety of employees (Productivity Commission, 2019). Improving awareness of mental health issues, eliminating stigma and encouraging consultation from available healthcare facilities are significant measures in improving psychological issues in the workplace (Tynan et al., 2018).

A variety of industries welcome initiatives to enhance me ntal health at work. A study which was conducted on implementing a peer based mental health program in the Australian coal mining industry consisted of: an education program on general awareness, a peer assisted model support and training for supervisors/managers promoted a good working environment with reduced stigma whilst encouraging teamwork (Tynan et al., 2018). The majority of participants reported that training in mental health was beneficial for their employees and would recommend the training program to other organisations (Tynan et al., 2018). The programs' direct effect on reducing stigma was positive with fewer participants stating that they believed a negative outcome would come out of disclosing their mental health issues (Tynan et al., 2018).

#### **Legislative Requirements**

Work Health and Safety (WHS) regulations aim to eliminate or minimise risks that can impact the health and safety of workers (Safe Work, 2019). The WHS laws lay out significant duties to manage risks associated with psychological health and safety (Safe Work, 2019).

A person conducting a business or undertaking (PCBU) has the main responsibility to guarantee that, so far as is reasonably practicable, employees, contractors, subcontractors volunteers, customers, visitors and work experience students are not exposed to psychological health and safety hazards arising from the business or undertaking (Safe Work, 2019).

Other legislative frameworks such as (a) Criminal laws which can be applied where incidents of bullying involves harassment or criminal behaviour, (b) Anti-Discrimination laws which regulates discrimination against certain groups including sex discrimination, it requires workplaces/ organisations to create changes that allow workers with mental health issues fulfil the essential requirements of their job and (c) Fair Work Act 2009 and some jurisdictional industrial laws, which addresses bullying at work, under this law an employer must not take any action against an employee asking for sick leave due to their disability (Safe Work, 2019).

#### Conclusions

Implementing a psychologically healthy and safe workplace is not a given; rather attentive focus is required to address potential workplace mental disorders and the potential consequences. The workplace is a crucial setting for promoting interventions for better mental health amongst workers, providing support for recovery from mental illhealth and reducing the risk of psychological issues by identifying and reducing workplace hazards. Creating and maintaining a mentally healthy workforce and workplace increases employee wellbeing, productivity and can reduce mental ill-health related to absenteeism and staff turnover.

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# Return to Work after an Injury: A Review of Australian Return to Work Benefits Post Injury or Illness

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#### Abstract

Workers compensation and injury management have a strong relation with early return to work after an injury or illness. There is common miss understanding that early return to work after an injury or illness can prolong recovery for the injured worker. The purpose of this literature review was to identify why injured workers should return to work and to highlight the significant benefits of return to work after an injury or illness.

Key Words: Return to work; Benefits of returning to work; Workers compensation; Injury Management.

#### Introduction

Work related injury continues to be a prominent public health concern, as it does not only affect the injured worker, but also the business they worked for, worker's colleagues, family, friends and the wider community (Kilgour, Kosny, McKenzie & Collie, 2014). Out of 13.4 million Australians who worked between 2017 and 2018, 4.2% (563,600) experienced a work related injury or illness (Australian Bureau of Statistics, 2018). Of the 563,600 people who experienced a work related injury, 60% had time off work (Australian Bureau of Statistics, 2018). More than half of work related injury involve time away from work: 11% of injured workers took off part of a day work, 42% missed one to four days, 26% took 11 or more days off work and a small percentage (6%) have not returned to work (Australian Bureau of Statistics, 2018). Workers who have been involved in a work related injury or illness, 84% continued practicing in the same job and 7% changed jobs ("Work-Related Injuries, Australia, Jul 2017 to Jun 2018", 2018).

Between 2012 and 2013 the worker related injury and illness cost the Australian economy \$61.8 billion (Safe Work Australia, 2017). According to Bohatko-Naismith, James, Guest & Rivett (2014) between 2008 and 2009 the estimated work related injury cost was \$60.6 billion, presenting a concerning increase of workplace injuries and the compensation claims in both State and Federal governments. Specifically, in Australia but also internationally, increasing awareness around long term absence is important as harmful factors rise such as both physical and mental health (Bohatko-Naismith, James, Guest & Rivett, 2014).

Injury management's primary goal is to enable injured workers to return to work (Yadav, Nikraz & Chen, 2015). The Workers compensation and Injury Management Act 1981 of Western Australia, main aim is to compensate workers who suffer an injury and management of worker's injuries through finical assistance (Yadav, Nikraz & Chen, 2015). An injured worker is entailed to medical expenses in relation to work related injury, rehabilitation expenses and weekly payment on a normal pay day (Yadav, Nikraz & Chen, 2015).

More than half of the work related injuries or illness received financial assistance with 52% received worker's compensation and while 45% did not apply for worker's compensation (Australian Bureau of Statistics, 2018). Between 2013 and 2018, there has been an increase of 39% in the number of people who did not receive financial assistance (Australian Bureau of Statistics, 2018). From the 389300 people who did not apply for worker's compensation, 43% didn't think their injury was considered necessary or was only a minor injury, while 13% were not aware of worker's compensation or not covered and 9% felt they weren't eligible for Worker's Compensation (Australian Bureau of Statistics, 2018).

The discussion will provide an in depth overview of the importance of returning to work providing support to the injured worker with returning to their job (Lankinen et al., 2019). Disruption to a work place can be caused from a worker getting injured at a workplace which can be reduced from compensation systems work together to return the injured worker back to work (Salzwedel, Reibis, Heidler, Wegscheider & Völler, 2019). Highlighting the importance of involvement of the employer, worker and treating medical practitioner in managing the injury to allow for positive outcomes in terms of cost control and return to work (Lankinen et al., 2019).

#### Methodology

The research was conducted through the Curtin University Library Database. The first search was done through ProQuest database using the key words used were "Workers Compensation" And "disease" AND "Injury Management" in which resulted in 120,493. A refined search was conducted to publications in the last 10 years on the topic Worker's Compensation and Injury Management of peer reviewed journals which yielded in 7155 results. Defining the search to "return to work after injury" within the last 10 years of peer review journals came up with 29,101 results. The first 2 pages provided enough adequate information with 25 articles per page.

A second article search was accomplished from using Science Direct database which was found to be more successful. The search presented 41 results which then was refined to data from the last 10 years which presented 4 results using the key words "Workers Compensation and Injury Management". The search was refined to "return to work" providing 1,152,583 results with only needing to access the first page of 25 articles. Key words to make the search more specific was "benefits of returning to work" and "worker's claim's". In total, twenty articles are included in the literature review; eighteen journal article and two systematic literature reviews.

Further information was needed to be sourced using the search engine Google. Information was sourced from Australian Bureau of Statistics presented results around the topic of Australian Worker's Compensation statistics. This search also looked at Australian legislation, the Workers' Compensation and Injury Management Act 1981. Government agencies such as Safe Work Australia, Work Safe Australia were used to identify the systems in place for injured workers to return to work. The overall Science Direct database was preferred due to having the most relevant search results.

#### Legislation

The Workers Compensation and Injury Management Act 1981 states that, "An Act to amend and consolidate the law relating to compensation for, and the management of, employment-related injuries, to provide for the WorkCover Western Australia Authority to provide for the resolution of disputes, and for related purposes" (Workers' Compensation and Injury Management Amendment Act 1981).

#### Discussion

#### The impact of not returning to work

Depression is a major health issue in which the symptoms are more problematic in injured workers compared to the general population as they are unable to attempt or sustain full return to work according to Thornthwaite & Markey, 2017. Franche et al. (2009) research also states that high levels of depressive symptoms are associated with injured workers, especially in the weeks following the injury and that around half of the workers with depressive symptoms persisted six months after the injury. Thornthwaite & Markey, (2017) also indicated that injured workers returning to the workforce with resuming a regular routine, presents a positive impact on the mental health of an injured worker.

Not returning to work and staying at home can cause psychological problems such as levels of anxiety, frustration, social dysfunction and depression according to Bohatko-Naismith, James, Guest & Rivett, (2014). Bostock, Patrizo, Godfrey & Forrester, (2019) agree and stated that this added extra stress on their family and partners. If the partner's role was in the home, they can feel unsupported if their injured partner doesn't go to work (Forrester, 2019).

Assisting workers back to work gives them the social support from their peers, limiting poor mental health issues and deterring negative lifestyle factors such as tobacco and alcohol use as stated by (McLaren, Reville & Seabury, 2017). The longer the worker stays away from work, Bohatko-Naismith, James, Guest & Rivett, (2014) conclude that it can decrease the chances of a worker going back to work and confidence in their ability to do their job well when they return, adding extra stress.

Similarly, it is in the best interest of the employer and the injured worker to return to work as early as possible according to Soo Hoo, (2019). The longer the injured worker is absent from work, Shaw-Mills, (2015) suggest that the harder it is for them to return to work. A study conducted on lower back pain showed that workers were able to return to work after the onset of pain after 4 to 8 weeks (Shaw-Mills, 2015). After a year from the onset of back pain, 95% had returned to work but from those workers who didn't return to work accounted for 65% of all workers compensation claims according to (Shaw-Mills, 2015).

A study conducted in by Ioannou et al., (2018) displayed a strong relationship as over half of the participants reported being worried about financial matters and recovery after a work related injury. Of those participants, 50% clinically reported symptoms of post-traumatic stress disorder and 30% presented symptoms of anxiety providing the importance of return to work after an injury to limit poor psychological functioning (Ioannou et al., 2018). Ioannou et al. (2018) also describes the link between compensation claim and financial stress. An example from the Worksafe Victoria claimants wage for the first 13 weeks post injury the paid rate is 95% of their pre-injury income, after 14 weeks and onwards is 80%, still providing financial support but can result in greater financial strain if the injured worker is unable to reach living cost (Ioannou et al., 2018). Due to prolonged time off work is a major challenge finically given productivity loss and medical and social cost of health care (Wang et al., 2019).

#### The benefits of return to work

Some benefits of return to work are providing financial support and re engaging the injured person with working life. This is essential for physical, psychological and social wellbeing to improve the quality of life (Wang et al., 2019). The chance of getting back to work after an injury within 20 days is 70%, in 45 days is 50% and in 70 days it 35%. According to Eggert et al., (2010) an early return to work after injury is related with a noteworthy decrease in long term income for injured workers which also minimizes the extent of career disruption. Extended time off work present direct and indirect costs on the employer from higher disability indemnity benefit payments and indirectly through the value of lost productivity (Eggert et al., 2010). As a result, evidence supports the effectiveness of early return to work through interventions which support the injured worker, allowing a reduction in costs of worker's compensation claims and the backfill of positions according to Bohatko-Naismith, James, Guest & Rivett, (2014).

This effective engagement with the workplace while the injured worker is going through the recovery process, according to Eggert et al., (2010) improves workers physical and mental health. By returning to work, there is financial security for the injured workers as they retain their position in the company. Consequently, Soo Hoo, (2019) states that the employer or return to work coordinator adopting systematic approaches to accommodate and communicate efficiently with the injured worker will enhance job satisfaction post injury by promoting an improvement in their performance.

The return to work coordinator or employer providing a supportive return to work program for an injured worker and making sure they understand the process and communicating effectivity to allow for a successful return to work of the injured worker stated by (Bohatko-Naismith, James, Guest & Rivett, 2014). According to Soo Hoo, (2019), returning to work tends to lead to increases in physical activity through incidental exercise. Presented through simple activity such as getting ready for work which helps improve recovery compared to staying at home as workers tend to be more sedentary when at home (Loef, de Hollander, Boot & Proper, 2016). Physical activity is important to regaining strength and mobility. Increased blood circulation and movement through the day help stamina and mobility improve (Loef, de Hollander, Boot & Proper, 2016).

#### Preparing workers to return to work

An injured worker needs the understanding from their employer that they don't have to be fully recovered before returning to work and a supportive work environment is a mainly key for a successful return to work (Sears, Wickizer & Schulman, 2014). Being contacted regularly by the employer or return to work coordinator aids the increase of the likelihood of the worker returning to work. Early return to work will increase the likelihoods of the worker to return to their original duties earlier (Loef, de Hollander, Boot & Proper, 2016).

Hence McLaren, Reville & Seabury, (2017) state that with effective strategies for reducing the time off work for an injured worker include modified duties and equipment, light duties, ergonomic interventions and reduction in work hours assist the increase of workers returning to work after or with an injury and making it comfortable to carry out the job tasks. According to Thornthwaite & Markey, (2017), research has proven that workers are two times more likely to return to work if offered a modified job in the company compared to not being offered a work opportunity. For an early return to work providing training options for different job if the injured worker can not return to original job enables a positive fit for the worker and the employer (Sears, Wickizer & Schulman, 2014).

Injured workers who are not concerned with lodging a worker's compensation claim are 3.1 times more likely to return to work compared to those who are concerned (Gray, Lane, Sheehan & Collie, 2019). The more complex an injury is can result in a longer period for claim decision making which can result in a prolonged work absence presenting finical and mental health issues (Kilgour, Kosny, McKenzie & Collie, 2014). The results from a cohort study conducted in Australian presented that stressful experiences with claims and delays in insurer decisions are associated with greater incidence of depression, anxiety and disability (Gray, Lane, Sheehan & Collie, 2019). Compensation culture can also promotion undesirable safety consequences present blame, excessive paperwork and lack of engagement (Oswald, Sherratt, Smith & Dainty, 2018). Workers feels they are a malingerer and have a fear of losing their job or feel they might be putting pressure on other workers (Robinson & Glass, 2015). Robinson and Glass (2015) also found that applying safe work processes and in the unlikely event on an injury, provide positive encouragement of return to work.

#### Conclusions

Overall the literature review highlights that returning to work after an injury if possible out ways the benefits of not returning to work after an injury. There is supporting evidence presenting that the increased time the worker off work due to an injury, it decreases their potential of return to work developing a negative impact on the worker's health and mental well-being. It is clear that there is are advantages for returning to work after an injury or illness with the employer providing a safe work environment on return with providing modified jobs if needed. Work practices, workplace relationships and culture, and injury management programs are a key factor in workers feeling valued and supported in their workplace. Workers should never feel pressured to return to work too soon by the company they work for or family as it adds to the psychological stress effects if the injured worker does not feel safe or ready to manage their work task.◆

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# Relationship between Good Business Management and Occupational Safety and Health

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#### Abstract

This article looks into the relationship between good business management and occupational health and safety. It is common for organisations to separate business management from occupational safety and health management, whereas they are integral to the success of the other. This article analyses published literature and Australian Standards, identifying the benefits of good business management and how it can directly affect the management of safety and health. Conversely, mismanagement of safety and health can have a detrimental effect on business management and business outcomes. The article further explores the integration of business management systems to encompass business objectives through quality and health & safety whilst looking briefly at the inclusion of environmental management requirements. Management commitment and leadership are found to be key to the success of all management systems and objectives.

Key Words: Business management. Safety Management. Business and Safety Management. Management and Safety.

Effective Management.

#### Introduction

The relationship between good business management and occupational health and safety is often divided into separate areas. The link between business and occupational health and safety management should connect the systems, in lieu of stand-alone system formats. When integrated together, business management combined with occupational health, safety and environmental management can safeguard the organisation against loss, both monetary and reputational. This article will show how strong business management, commitment, leadership, and culture, can lead to a robust, profitable organisation.

"In every country around the globe, governments are increasing the quality, health, and safety requirements" (Chen & Zorigt, 2013, p. 2321), as is evident in the global employment of International and National Standards for application in management system development.

#### Methodology

In order to research the relationship between good business management and occupational health and safety, a literature search was undertaken using Science Direct and ProQuest. The literature search was limited to full text English, articles published between the years 2005 and 2019. The search initially used the phrases "business management" and "safety management" and "safety and management", yielding 117,560 results. The search was then refined to peer reviewed Scholarly Journals in the last 10 year period, was also filtered using locations of Australia, the United States, the United Kingdom, Canada and New Zealand – yielding 20,049 results. Another search was conducted utilising the Science Direct database, yielding 101,609 results. After refining the search to include Australian articles only, the results decreased to 21,341. When further refining the search to the period between 2009 and 2019, the result total was 13,506. Australian Standards were also referred to (AS/NZS ISO 9001:2016 Quality Management Systems, AS/NZS ISO 45001:2018 Occupational Health and Safety Management Systems and AS/NZS ISO 14001:2016 Environmental Management Systems). Ultimately, twenty eight publications were considered for the literature review. Considered publications were based on relationship to business and health and safety management and system integration.

#### Discussion

#### The Integrated System

Combining quality management with health & safety and environmental management objectives into an integrated management system can enhance management planning and processes and provide a shift in cultural significance to both quality and safety (Chen & Zorigt, 2013). Studies of integrated management systems have reported an increase in productivity, effectiveness and competitiveness.

Wilson, Gahan, Robertson and Lennard (2018) support the notion that quality management systems can aid in ensuring that organisations achieve business objectives and continual improvement. Essentially, quality management systems consist of policies, processes and procedures that aid the organisation in continual improvement and meeting business objectives (Wilson et al., 2018). It is important that the management system not be overly complex or bureaucratic in nature as this can result in a negative culture and a negative impression of the management system. An effective quality management system should be "fit for purpose", aiding individual organisations to meet their objectives, continually improve, be adaptable and flexible, address risk management and ingrain a quality culture into the day to day operations and processes (Wilson et al., 2018, p. 136).

Tuominen and Moisio (2007, p. 5) suggests that "for an organisation to be competitive, it must continually improve the quality of its products and operations as well as environmental and occupational health and safety performance". By referencing international standards such as ISO9001 (Quality), ISO14001 (Environment) and OHSAS18001/AS4801 (Occupational health and safety), an organisation can gain information in the form of guidelines and instructions in creating an integrated management system approach, culminating in a holistic management system (Tuominen & Moisio, 2007). The three standards have similarity in their contents, which are complementary to each other, and can also be used independently (Tuominen & Moisio, 2007). All three standards have a focus on understanding the organisation and its' context, commitment and leadership, planning, support, operations, performance evaluation and improvement.

Wecher-Seipke (2014, p.38), suggest that using a formal safety management approach based on the Standards is an effective way to "keep everyone on the same page", with the Standards creating a consistent approach to business management. For the successful implementation of health and safety management, it must be linked with business management approaches such as quality management, and strong leadership and cultural values (Chen & Zorigt., 2013). One motivation of creating an integrated management system is to unify internal and external auditing procedures, reduce documentation and time saving (Fan, Ching, & Kan, 2014). The integrated system may lessen duplication, improving both productivity and efficiency, reducing both waste and operating costs.

Management systems should be used to connect all aspects of the organisations operations. There is no function of an organisation that is a stand-alone feature – all functions interrelate and connect in some way. (Susca, 2019). "All elements of a management system must talk to one another" (Susca, 2019, p. 19).

Pagell, Klassen, Johnston, Shevchenko and Sharma (2015) explore the idea that operational and safety management are complementary to each other. Studies have shown that business practices which encompass both quality and safety management, are able to improve both operational and safety outcomes (Pagell et al., 2015). When safety and business management systems are combined in a "joint management system", research has found that safe and effective systems have been created (Pagell et al., 2015, p. 2). The shared goals of a joint management system ensure that both managers and workers have knowledge regarding both production and safety, with the end result being that shortcuts are not taken, which decreases the risk of volatility. Pagell et al. (2015) research concluded that when management systems do not include safety and operational business requirements but are treated separately, the system can be contradictory and can create instability in production. Lyon and Hollcroft (2005) found that there are many more similarities in the different management systems, than there are differences and that leadership and commitment are common components. With continual improvement being a key to all Standards, the focus is truly on systems and processes that result in system excellence Lyon and Hollcroft (2005).

Lyon and Hollcroft (2005, p. 45), state that occupational health and safety management systems are "becoming the method of choice" with organisations who are wanting to improve their work health and safety. Fulwiler (2000) concludes that it is essential that health and safety is built into business management priorities, as when health and safety needs are met, there is an equal response to business outputs.

#### **Business Profitability**

Camplin (2011, p. 47) maintains that the main aim of a business venture "generally is to make as much profit as possible while conforming to society's basic rules, those embodied in law and ethical custom (Camplin, 2011). Business management should show that safety is actually a positive investment in the business and not a cost to business (Camplin, 2011).

The approach to safety management in the 1980s and 1990s was focused on loss prevention, where the focus was on reducing costs incurred through accidents and incidents (Wachter, 2011). This approach generally aligns with common business management practices.

Management needs to provide support and attention in order for the organisation to achieve effective safety management (Camplin, 2011, p. 46), with the health and safety officer needing to seek "active support for safety function affairs from higher level management". Expenses attributed to health and safety need to be justified and presented in a way that shows that company profits will be positively affected (Camplin, 2011).

Camplin (2011) sees the value of effective safety management as more than a financial value, but also the added benefit of social responsibility and corporate governance. Benefits of good management should include business profitability, the health and safety of people, whilst also looking after the environment.

Loebbaka (2008) proposes that the safety performance of the organisation has great significance to both the financial and societal consequences, making safety management a critical element of the organisations management structure. Using a strategic management plan, such as a Global Model, combining a mix of management approaches, the organisation can generate a competitive advantage. Strategic choices are directly affected by regulations and stakeholder influence such as occupational health and safety and environmental regulations (Loebbaka, 2008).

Statistics show that costs associated with occupational injury and illness can be reduced significantly with the implementation of effective management systems (Lyon & Hollcroft, 2005). With the significant costs of occupational deaths, injuries and illnesses, organisations are seeking to reduce these expenditures by implementing effective management systems and consequently saving substantial costs (Lyon & Hollcroft, 2005).

Safe Work Australia (2014) reported an estimated cost of \$60.6 billion for work related injury and illness (Joss, Dupre-Husser, Cooklin & Oldenburg., 2017). Reduction of costs due to ill health and accidents is an important financial benefit to effective health and safety management (Successful Health and Safety Management, 2011).

Safety initiatives can cost money, but they also save money (Baker, 2014). Whilst the total cost of injuries can be tallied, the total does not reflect the associated costs of higher insurance premiums, lost time, production loss, retraining or hiring new workers, damage to plant, products or the environment, the cost of low employee morale directly due to the incident and administrative costs (Krouse, 2009; Baker, 2014; Successful Health and Safety Management, 2011). Significant incidents can lead to direct financial losses, economic impact, interruption to business undertaking and impact to reputation (Gerbec & Kontic, 2017).

Cost cutting in the form of cutting the cost to safety, not spending on safety resources and maintenance, can lead to substantial losses and disruption to business operations (Jennings, 2010). Failing to see the significance of and ignoring safety issues and concerns can be a recipe for disaster, with great financial cost to the organisation and possible detrimental effects to the environment and business reputation. One study conducted in the UK indicated that by reducing safety risks by 50%, an achievement of 12% productivity increase was made. This equated to a cost saving of \$2.4million in labour costs. Similar studies yielded very

\$2.4million in labour costs. Similar studies yielded very similar results. Effectively, "being safe is a very good business practice" (Fridlyand, 2004).

#### Management Support & Leadership

All "management systems require management leadership" (Lyon & Hollcroft, 2005, p. 46), to be successful. McNeely (2012) delves into organisational culture and how, with the support of senior management, the development of a safety management system can positively influence the culture of the organisation. The better the safety culture of the organisation, the better the implementation of the safety management system appears to be.

Successful business management encompasses the various stakeholders of the business including employees, customers, suppliers, financiers, managers and communities (Camplin, 2011), and management must address their values.

Successful leadership encompasses honesty, competency, intelligence, fairness, support, influence, inspiration, engagement, and challenging characteristics (Krouse, 2009). Poor leadership and safety culture has been seen as a link to negative outcomes and significant incidents (Krouse, 2009). The values of leaders are imposed on organisations and this leads to a change in attitudes, actions and people's perception. High quality leadership has also been seen to improve communication and commitment to safety initiatives (Krouse, 2009), enabling employees to partake in a value base and a clear vision of the organisation.

When workers see their leaders as being positive and promoting health and safety, they tend to be perceived as being committed to the health and safety of the workers (Fruhen, Griffin & Andrei., 2018).When the worker perceives management commitment to health and safety, this can result in employee behaviour being more safety compliant. The failure to create a successfully integrated business management system can, more often than not, be attributed to a lack of commitment and leadership of management (Chen & Zorigt., 2013).

Hansen (2008) believes that the cause of accidents are due to organisational and culture behaviours, namely leadership and management issues, not unsafe behaviour, as is commonly thought. The problems arise in the values held by management and leadership and are not the cause of risk-taking behaviours. The system creates the problem. Change the management structure and processes, and you will change the rate of accidents and incidents. As it is management that controls decision making about the system, it is management that is to be held accountable for the inadequacies of the system (Smith, 2011.

#### Legal Requirements

The Australian Government (2019) explains the requirements of occupational health and safety laws, and the efforts to obtain consistency in laws across Australia. Work health and safety laws do, however, differ between states and territories and it is imperative that management systems capture the requirements of the relevant state/s or territory/s that the organisation conducts business in.

#### Conclusions

Organisations often separate business management and health and safety management into separate areas. However, by integrating quality, health and safety and environ- mental systems, a robust business management system can be created, interlocking all areas of the business into a cohesive, holistic system.

An effective management system should adequately explain all aspects of the business, it's processes and procedures – it should be the "go to" to answer any questions on organisational practices and procedures. Not only will an integrated management system help an organisation to comply with applicable regulations but, if used correctly, it acts as a tool to continually improve the organisation processes and procedures, effectively building a better, stronger business enterprise.

An integral part of the success of any management system, is strong leadership and commitment of management.

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#### Abstract

This paper examines why there is a need to provide occupational safety and health education and training. The history of workplace health and safety education and training is traced through British legislation, the International Labour Organisation (ILO) and through Australian law. Case studies and examples of what is currently included in work related safety and health education for children, people in the workplace, for the public, and the benefits of this education, for children, people in the workplace, for this education, are included.

Key Words: Workplace Safety and Health. Education. Accident Causes. Public Safety.

#### Introduction

With the many technological inventions used in industry there is an increasing need for employee work related education and training to be able to do the work safely. Many accidents occur when people are new to a workplace if education is not provided on how to work safely (Burt, 2015). The following is an example from Australia. As part of giving public service and helping the next generation to learn about working in industry a 15 year old college student was provided with work experience at Tho Services Limited. This student was given a visitors induction at the workplace. The work that the student was asked to do was welding, but he was not given any education or training on how to wear the supplied welding helmet or told about the need to pull down the eye protection visor to protect his eyes while he was welding, so he did the welding with no eye protection. This resulted in the work experience student receiving flash burns to his eyes and losing part of his vision permanently in both eyes (Supreme Court New South Wales, 2016; ABC, 2016).

The student now requires visual aids for the rest of his life, he cannot play football or cricket which he previously enjoyed doing as he now cannot see the ball, his future employment prospects are limited and his quality of life is decreased. The employing company was fined \$240,000 by SafeWork New South Wales for breaching section 32/19(1) of the Work Health and Safety Act 2011. The company owners could not pay this amount so the company went into liquidation and all employees lost their job at this company (Supreme Court New South Wales, 2016; ABC. 2016).

This case study highlights some of the reasons that education and training are a pre-requisite for knowing how to work safely. In this case the lack of safety education for a work experience student affected a small number of people. A case where lack of training and education affected the safety of a larger number of people was the Bhopal Methyl Isocyanate (MIC) Pesticide Plant disaster in India on the night of the 2nd to the 3rd of December in 1984.

#### Who Needs Education and Training?

The following story of the Bhopal disaster illustrates that everyone who is employed by the company at the workplace, and also people in government and the community, need education related to workplace safety.

In 1975 plant operators at the Union Carbide India Bhopal Methyl Isocyanate Plant had received an average of 18 months safety and work related education and training on how to operate the plant safely. Over the subsequent years the amount of work related education and training that the plant operators received had decreased to less than a month per person by November 1984 (Chouhan, 2005). In 1981, after the technical experts from the United States of America left this Union Carbide Plant because the plant was not making a profit, there was very little work related training and education provided for employees (Bowonder, 1987). In 1984 the remaining plant operators had been trained to use storage tanks that were later modified, but no training was provided to the plant employees on the use of the modified tanks (Weick, 2010). This highlights the need for ongoing employee education, particularly when there are work related changes. On the 3rd of December 1984 the work supervisor ordered the washing with water of the 4 lines to the MIC tank as the tank was not pressurising and the lines were blocked with rust and solid sodium salts (Chouhan, 2005). The supervisor had only worked in the area for one month and had just been given the maintenance responsibilities. To save money the company had eliminated the position of maintenance supervisor (Weick, 2010). The workplace supervisor did not understand the plant operations, had not been told how the equipment at the plant operated or the correct way to do the equipment maintenance. The operator who was washing the lines was a new worker. He did not know that he needed to put a slip blind into the pipe so that the

water would not go into the MIC storage tank and cause a chemical reaction (Bowonder, 1987; Weick, 2010). This highlights the need for work related safety education and training for new employee at a company and for employees who are new to an area of work.

When there was a build-up of pressure in the MIC tank due to an exothermic reaction with the water that entered the tank due to the line clearing workers could smell MIC in the air, but chose to ignore this as they did not know what to do (Weick, 2010). An hour later there was a massive explosion. The situation was made worse in that none of the fire and rescue squad members were trained or qualified to deal with this type of accident (Chouhan, 2005).

There was also lack of community safety education about the Bhopal Union Carbide plant and its products. The Government allowed the Union Carbide Bhopal plant to be placed in a residential area and for members of the general population to live in large settlements close to the plant when this plant was manufacturing MIC based pesticides as members of the government did not understand the dangers of this decision. The general population also did not know the dangers of living close to this major hazard facility (Bowonder, 1987). This highlights the need for education related to major hazard facilities to be provided to decision makers in government and to the general population.

Following the explosion at the Bhopal Union Carbide plant the company Medical Officer told the Director General of Police and the Mayor of Bhopal that the MIC gas was only a minor irritant and that there was no antidote (Bisarya, & Puri, 2005). In contrast Professor Gehoawat, who was present in Bhopal at the time, knew that the gas was heavier than air and that he needed to stay inside his hotel room to avoid exposure to this gas. He told all of the hotel guests to '(i) shift to the top floor, (ii) to close all of the windows, (iii) to switch on the ceiling fans and exhaust fans, (iv) to breathe through wet napkins and (v) to wash eyes with water as frequently as possible' (Gehlawat, 2005, p.261-262). Gehlawat knew that milk was an antidote to the gas as casein and other substances in milk absorbs toxic substances, minimise entry into the blood stream and minimise the effects on other body systems, so he asked the hotel manager to give milk to all of the hotel guests. He had studied the effects of chemicals for many years so knew what to do to assist with chemical injury mitigation (Gehlawat, 2005).

At a temperature of 200D C (which the MIC did reach) it forms a gas that contains hydrogen cyanide (HCN). The Medical Officer did not know this. The antidote to HCN is sodium thiosulfate which was given to some of the exposed victims and saved their life (Broughton, E. 2005). A German toxicologist came to Bhopal with 50,000 injectable vials of sodium thiosulphate, but was asked by the Government to leave Bhopal and not to provide the antidote to gas exposed people (Bowonder, 1987; Bisarya, & Puri, 2005). The above information, if provided by the Union Carbide Medical Officer to the authorities, could have saved the lives of many of the people who died and would have given authority to the government to allow the provision of the antidote to the people who required it.

The Bhopal plant workers knew to stay indoors and none of these workers died due to the effects of the gas from the explosion. However, as a result of this accident there was the immediate death of 3,787 people in the streets of Bhopal. Trees in the path of the gas lost all of their leaves and many animals died, particularly cattle. The problem of disposing of the dead human and animal bodies became an environmental health problem (Bisarya, & Puri, 2005). A further 3,000 people died within a week (official government figures. Other estimations were that 30,000 people died within a week). The Indian Government has recorded that 47,787 people subsequently died as a result of their exposure to the toxic gas (81,574 government recorded deaths) and 558,125 people were injured with, in some cases, severe and disabling injuries (Gehlawat, 2005; Broughton, 2005; Eckerman, 2005; Bhopal disaster, 2017; Delhi Science Forum, 1985). In 2003 compensation was awarded by Union Carbide to 554,895 people who had permanent severe disabling injuries as a result of their gas exposure on the night of the plant explosion and to 15,310 families where a family member was killed by the gas but at least one other family member survived (Broughton, 2005).

The high number of deaths and permanent disabling injuries was, in part, due to insufficient employee education and work related training, to the lack of knowledge of the company medical officer, to lack of government knowledge about plant related safety, and due to lack of knowledge by the general population of the effects of the products manufactured at the Union Carbide Plant in Bhopal.

This disaster shows that for people to know how to work safely and to understand the dangers in a workplace there should be relevant education for everyone who has decision making and that employees and their supervisors need to be trained in how to perform their work correctly and safely.

Oxford Dictionaries (2019, p.1) define education as 'the process of receiving or giving systematic instruction'. Business Dictionary (2019, p.1) record that training is an 'organized activity aimed at imparting information and/or

instructions to improve the recipient's performance or to help him or her attain a required level of knowledge or skill.' Much of the work related education may be provided through educational institutions, such as the formal degree qualification for a medical practitioner, while the training would be more likely to be provided by people at the workplace, such as instructions by a supervisor to an employee on how to put a slip ring into a pipe and an explanation of why this is required to have a safe work process.

#### History of Work Related Education and Training.

In the early years (before the industrial revolution) parents and tribe members provided training to their children on how to hunt, gather and later to do farm and other work so that the children did not get sick, injured or killed while working. The most common education and training method used was buddying up an inexperienced worker with an experienced worker so that the experienced person could explain how to do tasks to the learner. In this situation there was individual training and the education provided depended on the knowledge level of the trainer.

Then came the industrial revolution with machinery that could be dangerous to operate, the use of chemicals and other substances that could harm human health, more complicated work processes and the employment of people (employees) for long hours for wages. These workers were employed to make money for factory owners. Many factory owners were just interested in producing products for profit and did not consider their employees work related safety and health. Employees were just part of the production process. Employee collective power was weak at the beginning of the industrial revolution as most employees just wanted to have a wage to be able to support their family. Factory owners provided very little employee work related education.

Working conditions in the 1700s were difficult and often unhealthy in Britain. The first introduced safety and health legislation related to stopping very young children from working. This legislation was the 1788 Chimney Sweepers Act that was based on Dr Percival Potts's 1775 cancer research. Boys as young as four were being used as chimney sweeps. The chimneys were usually 9 by 9 inches wide so a small person was required to clean them. This Act stated that no boy should be bound as an apprentice before he was eight years old. His parents' consent must be obtained for the child to be employed as a chimney sweep, the master sweep must promise to provide suitable clothing and living conditions, as well as an opportunity to attend church on Sundays (Humphries, 2012).

In 1882 morals was in the title of the Health and Morals of Apprentice Act introduced by Sir Robert Peel because, once a month, the apprentices were required to attend a religious service to receive moral education. Apprentices were to be prepared for confirmation in the Church of England and must be examined on their religious knowledge by a clergyman at least once a year. Male and female apprentices were to sleep separately and not more than two per bed. Apart from when they attended church and were working in the mill children were locked into their upstairs (above the mill) accommodation. Child apprentices were from poor families and were bound and unpaid until they turned 21 years old. Most of the children working in the mills were between 5 and 8 years old and worked 13 or more hours a day. The local magistrates had to appoint two inspectors known as visitors to ensure that factories and mills were complying with this Act. One inspector was to be a clergyman and the other a Justice of the Peace. These were the 1st workplace inspectors and were unpaid. Very little work related education or training was provided to employees in the 1800s in Britain. Under this Act there was more focus on religious education than work related education and many children died from work related causes (Morrish, 2013).

In Germany in 1871 Chancellor Otto von Bismarck introduced the Employers' Liability Law. At this time in Britain workers were covered by Common Law. Under common law if a worker could be found in any way responsible (contributory negligence) for a work related injury, such as the employee slipped on a workplace floor and broke his or her arm, then it was the employee's fault and no compensation could be claimed by the employee. There was a culture of blaming the victim for their work related injury, ill health or death. If the injury resulted in part from any action, or inaction, of a fellow employee then, under the fellow servant rule the employer was not responsible. To ensure that the employer had no responsibility for any work related injury or ill health when an employee signed a contract of employment then the assumption of risks of harm from doing the work was formalised in many workplaces with the employee abdicating all rights to sue to obtain payment for any work related injury or illness. This was 'known as the "worker's right to die," or "death contracts" (Guyton, 1999, p. 106).

Following the introduction of the Employers' Liability Law in Germany in 1880 the British Parliament passed the Employers' Liability Act. This was the first British legislation in which employers would be required to pay workers' compensation if the accident was caused by the negligence of a manager. It also abolished the 'assumption of risk' that employees previously took when they accepted employment. As there was now a financial consequence for work related injuries that could be traced back to employer management of the work, employers began to provide employee work related training. However accidents were considered by many employers as the results of poorly motivated employees not paying attention to what they were doing. Safety education was a matter of telling people to be more alert (History of occupational safety and health, 2019, p.17).

In the United States of America many employees were injured, died or developed black lung disease (pneumonconiosis) when working in the coal mining industry. In an effort to improve coal mine safety in 1864 the Pennsylvania Mine Safety Act was brought into law. This was the first workplace safety law in the United States of America and, to cover employers against paying for employee work related injuries, ill-health or a work related death at the same time the first insurance policy was issued in the United States of America. However it was not until 1970 when President Nixon signed into law the Occupational Safety & Health Act that legislation in the United States of America required employers to provide employees with education and training to safely do their work (Braithwaite, 1985).

In Australia 1800 to 1911 was the era of social legislation in which Australia had its first occupational safety, health, welfare and workers' compensation laws passed and enforced by the government. 1911 to 1959 was the inspection era where safety inspectors targeted checking guarding, housekeeping and physical conditions. Before the 1970s occupational safety and health legislation in Australia was prescriptive, detailed and hazard specific. Safety was seen as the responsibility of government inspectors. Safety Performance was measured by disabling injuries and employees were not required to have safety education.

In Britain, in 1972, Lord Robens submitted a report on occupational safety and health legislation with recommendations to change from having specific requirements to having a general duty of care which applied to everyone who could affect, or be affected by, workplace safety, including the employer, employees, manufacturers, installers, suppliers of goods and services, to ensure that the workplace, work processes, goods and services were safe and healthy for everyone who came on to the workplace, conducted work processes, and/or who could be affected by the work, goods or services provided (Brooks, 1987; Ochsner, & Greenberg, 1998; Adams, Hede, Holloway & Jackson, 1999; Milgate, Innesb & O'Loughlinc, 2002).

As well as the Robens report findings being the foundation of new British occupational safety and health legislation these findings were taken by the International Labour Organisation (ILO) and were published as ILO Convention 155, Occupational safety and health and the working environment. This Convention was ratified by many countries. When an ILO Convention is ratified by a country's government it forms the foundation of the country's law related to what was ratified. One of the countries who ratified ILO Convention 155 was Australia, so the Robens philosophy was incorporated into Australian occupational safety and health law.

As part of the Robens philosophy, which became law in Australia, employers had a responsibility to 'provide such information, instruction, training and supervision of the employees as is necessary to enable them to perform their work in such a manner that they are not exposed to hazards' [Occupational Safety and Health Act, Western Australia 1981, s19(b)]. To meet these requirements the employer had to provide all employees with instruction, training and work related education related to being able to complete their work safely. To check if this was actually happening in industry in 2019 the author asked people who were working in industry if they had received this work related education. Following are two replies.

"As for my call centre experiences regarding health and safety education all I can say is that the safety person always comes in during the induction, tells you that his door is always open but you quickly learn when you hit the floor that if you want to learn anything about your workplace safety or health or have any complaints and you raise them with your supervisor (who is on a temporary contract also) they won't raise them as they are worried about their job and if you raise any issues or ask for work related safety education then you will find your contract not being renewed at the end of the 3 month period. I guess the main point I was trying to make is that in this society we have such an enriched outsourcing environment where everyone is so worried about their job that they do not spend any time, apart from one orientation lecture, on safety education, employees are afraid to bring up safety issues and these sort of companies prime focus is on making money; not its employees safety education and well-being."

In this case, although there is a requirement for education and training, the employee feels that, apart from in an orientation lecture, the legal requirements are not being met. In general, in Australia, if an industry is perceived as not being dangerous employees would receive a safety induction and an emergency procedures presentation. In industries where there are more perceived hazards safety education may be given on a daily basis. The following survey reply is related to one such industry.

"In Western Australia mining used to be one of the most unsafe industries, but this has changed dramatically and it is now one of the safest industries in the world."

#### The Western Australian Mining Industry

The path for the Western Australian mining industry to being one of the safest industries goes back, in part, to the implementation of the Robens Report recommendations into workplace safety and health legislation. In the United Kingdom (UK) in the Coal Mine Regulation Act 1872, there was a provision for mine workers to be involved in inspecting the mine in which they were working to ensure that it was safe. These employees were called Check Inspectors. Lord Robens saw how effective these Check Inspectors were in improving workplace safety and health so he included in his report employee involvement in workplace safety and health.

After the Australian Government ratified the ILO Convention 155 Western Australian mining industry safety and health representatives came into existence in 1995 with the implementation of the Mine Safety Inspection Act 1994. Safety and Health Representatives were employees who were elected by their peers to represent people in their work area on workplace safety and health matters.

Under this law safety and health representatives are legally required to attend a 5 day course to learn how to identify, assess and apply risk management processes to workplace hazards; how to conduct workplace inspections and investigations, apply health & safety legislation, communicate information on safety and health matters in their workplace, how to resolve conflict and issue Provisional Improvement Notices. Safety and Health Representatives are also encouraged to continue to attend other courses to update and improve their occupational safety and health knowledge. The knowledge that these employees gain through this education is then used to improve workplace safety and health.

In Western Australia, under the Mine Safety and Inspection Act 1994 and under the and Geothermal Energy Safety Levies Act 2001 a levy is collected from the mining companies and from major hazard facility companies to pay for costs associated with administering and enforcing safety laws. In 2015-2016 the levy collected was \$25,160,000. The mining inspectors, as well ensuring legislation compliance engage with managers and other mining industry employees to provide education related to improving company risk management (Department of Mines and Petroleum, 2016a).

To be a Western Australian mining inspector the employment requirements are to have a Bachelor of Science or other approved Bachelor degree in an occupational health and safety discipline relevant to the resources industry. Qualifications or training in occupational hygiene, noise, environmental health, radiation, ventilation qualification or training in risk management or a related discipline are considered favourably. Demonstrated knowledge and experience of the practical application of occupational safety and health legislation and risk management principles within the resources sector is essential. Experience and skills in investigations managing emerging issues, changes and projects is required. Demonstrated ability to listen, understand and adapt to communication style and message to suit a range of audiences including the ability to negotiate effectively and convey information and structures via written and oral communication is important. Once employed there is also ongoing safety education for Inspectors to keep them up to date with work related knowledge.

As a summary these inspectors need to have completed formal tertiary education qualifications to have the knowledge to do their work, but they need more than this. They also are required to have good communication skills to enable the people who work in the Western Australian mining industry to learn from their expert safety knowledge. One of the outcomes of the work of the inspectors in sharing their work related safety knowledge is an improvement in the safety practices in the Western Australian mining industry. In Western Australia, in 1900, there were 45 fatal accidents reported. This was a fatality rate of 20% (Gilroy, & Jansz, 2014). In the year 2012 there were no fatalities in the Western Australian mining industry (Jansz, 2012). In 2015-2016 there were four fatal accidents from an average work force of 102,343 workers. This is a fatality rate of 0.0039%. While this fatality rate is low the aim is always to have no fatalities as was the case with the Western Australian mining industry exploration workers (2,223 workers with no fatalities) in 2015-2016 (Department of Mines and Petroleum, 2016b).

Managers and many other employees who work in the Western Australian mining industry have formal work related education and qualifications. Other education provided is generic occupational safety and health education related to the Western Australian mining industry. Workplace health and safety orientation education can take between one to five days, depending on the company and the work that the employee will do. To keep up to date with occupational safety and health there are workplace Tool Box Talks that are often presented by the mining industry safety and health representative, by other employees, or by safety professionals. At the start of a work shift in the mining industry there are Safety Shares in which employees share with the rest of their work team any safety related matters from the previous day, and lessons to be learnt (positive or negative) are discussed This is followed by talking about the safety factors that are important for the work in the shift that the employees will commence. Finally there are Safety Stops, usually when employees need to be trained in important safety matters by their supervisor. All of this education has contributed to making the Western Australian mining industry one of the safest industries to work in.

#### **Workplace Safety Education**

The first accident prevention model was developed by Herbert William Heinrich who was born in America 1886 and died on the 22 of June in 1962 at the age of 76. Heinrich was an Assistant Superintendent at the Engineering and Inspection Division of the Travellers' Insurance Company when he published his first book called Industrial Accident Prevention: a scientific approach, in 1931. In the 1920s when Heinrich conducted the research on the insurance forms the employers blamed the workers' actions for causing accidents. This was similar to the blame the victim culture in Britain at this time. The five dominos in Heinrich's theory of accident causation were (1) Social environment and ancestry. (2) Fault of the person. (3) Unsafe conditions and / or unsafe act. (4) Accident. (5) Injury (Hudson, 2014; Javaid, Isha, Ghazali & Langove, 2016). This model was important as it formalised the need to prevent accidents from occurring by removing step 3, which were the unsafe conditions and act that occurred in the workplace to cause the accident that resulted in injury (Heinrich, 1931). To assist with the prevention of unsafe acts this model highlighted the need for employee safety education.

An American company that developed formal workplace employee safety education in 1930s, following the publication of Heinrich's accident sequence model, was the Bell telephone company. This company trained its employees on safe work methods on the job and in the classroom. It displayed safety posters on the workplace walls to remind workers to work safely and had printed work procedure instructions. There was learning from workplace incidents and the workplace incident and accident report produced each month was shared and discussed with employees so that they could learn about the causes of accidents and how to prevent them from occurring. This company did more than just have employee education as, to improve work related safety, it included putting safety in the design stage of workplace tools, testing equipment for safety and purchasing equipment that was

safe to use (Bell Telephone Company. 1949). In the 1930s this was considered best practice in workplace safety.

In 2000 research was conducted to identify the aspects of organisational management that produce the best business outcomes in health care organisations. The findings of this research identified that what was most important was for the organisation to have a mission and a culture of care for everyone who came on to the business premises (Jansz, 2014). This is the same as the conclusion that the Robens report came to and resulted in a general duty of care being included in workplace safety and health legislation. Part of the model developed from the health care industry research included management providing and facilitating employee education and training, and employees being educated and trained in work related tasks. This resulted in minimal employee occupational injuries and sick leave. For private hospitals there was an increase in the number of customers due to a high standard of care being provided and the research identified that this made private hospitals more profitable. For government hospitals there was a decrease in the number of customers due to employees knowing how to work safely and giving correct patient care. Having less customers in government hospitals meant that less of the general population's tax money had to be used to support government provided health care (Jansz, 2014). When employees have work related education they are not only able to work more safely but are also able to work more efficiently and effectively. In contrast to this when employees do not have effective work related education and training major accidents can occur. An example of this is the Longford gas plant accident that occurred in Victoria, Australia.

At the Gas Plant at Longford in 1998 operators worked a 12 hour shift and during that time had to deal with 8,500 alarms so often worked in alarm mode. Through missing an alarm an operator allowed the plant to continue production with the condensate liquid above 100%. This caused the warm oil pumps to shut down. It took several hours for these pumps to be started during which time the metal heat exchanger became very cold (- 50 degrees C). When the warm oil was introduced there was brittle metal fracture and the gas explosion that killed two men, injured eight other people and cut off Melbourne's gas supply for two weeks.

Part of the cause of the accident at Longford was that the Engineers, who knew about brittle metal fracture, had been relocated from the Longford plant to the head office in Melbourne. The Royal Commission, which was held to investigate this accident, found that the control room operator was not to blame for this accident as neither he, nor anyone else at this workplace, understood what caused brittle metal fracture. When hundreds of litres of fluid began flowing on the ground the operators thought that the bolts just needed tightening. Maintenance men were called to re-tension the bolts, but they found that no adjustment was required.

ESSO insisted that they had trained the employees about aspects of operating the gas plant. When tested on-line about what they had learnt some of the employees had ticked the right answer without understanding what their answer meant. For example, an employee had ticked "thermal stress" as a correct answer because that is what the book said was the correct answer. When questioned in the Commission investigation, this employee said he had no idea what "thermal stress" meant. Not understanding what thermal stress was contributed to the employees' decision to re-introduce warn oil into cold pipes which was a cause of the pipes rupturing (Hopkins, 2000).

Following this accident the court ordered penalty that ESSO paid for failure to adequately train employees and to adequately train supervisors was \$(A) 2,000,000 ( Hop-kins, 2002).

As an outcome of this accident, and many other work related accidents, it became clear that employees must be education on hazard identification for the hazards or actions in their workplace that can cause harm, be trained in risk assessment, risk control and how to use the hierarchy of risk control measures. If an employee cannot implement risk control measures then they need to be trained to report the hazards that they identify to their immediate supervisor, or to the person who can provide the risk control measures required to make the workplace and work processes safe. As illustrated by the Bhopal case there is a need for the general public to also be provided with safety education.

#### **Public Safety Education**

In Australia most of the safety education provided to the general public is related to road safety. This education is provided through the media, through fines and through car drivers loosing demerit points for driving over the speed limit or having unsafe actions when in a car. In Western Australia once the driver has 12 demerit points their license to drive is lost for three months. There are no rewards for driving a vehicle well, except that the person can remain licensed to drive.

According to the Safe Work Australia (Safe Work Australia. 2016) publication on Australian work-related traumatic injury fatalities from the year 2003 to 2015, two thirds (2,081 out of 3207) of work related traumatic fatalities involved vehicle collisions while the employee was

performing work duties, most often on a public road, and 60% (803) of bystander (member of the public) work related fatalities were due to a vehicle collision while an employee was working, or the member of the public was hit by a work vehicle. In Australia the work related road transport fatality rate between 2003 and 2015 was eight times higher than the combined fatality rate of all other industry causes (Safe Work Australia. 2016). In 2015, 115 of the 196 work related fatalities involved a vehicle. It was also noted that 187 (96%) of the work related fatalities in 2015 were male (Safe Work Australia. 2016).

For children in Western Australia there have been a series of videos that have been shown on TV to promote children to think of safety before they act. WorkSafe Western Australia has 'Planet ThinkSafe' as an online educational resource for primary school children. It provides information to help children develop a positive attitude towards, and the skills to be, safe at school, home and in the community. It is part of the educational curriculum in primary schools and has cross-curricular courses and activities that have been organised into three levels; for lower, middle and for upper primary school children.

The WorkSafe SmartMove website is a comprehensive occupational safety and health educational resource for senior high school students and for new young workers that are entering the workforce on a work placement, work experience, or as a school-based trainee/apprentice. Features of the SmartMove website include having a Smart-Move Certificate program containing one general and fifteen industry modules. High school students must pass and obtain this Certificate before being allowed to do industry work experience. The SmartMove Safety Passport program contains eight progressive online lessons that include videos, online learning activities, printable worksheets and a resource section that contains information sessions on current occupational safety and health topics. This program also has mapping documents and assessment tools for the national competency unit BSBWHS201A, over seventy printable occupational safety and health lesson plans and worksheets that provide over 100 hours of activities for educators.

In Western Australia it is considered that all children need to know the principles of safety and health before they enter the workplace, have an understanding of how to identify work related hazards, assess the risk, report this risk to their supervisor and refuse to do any work that they do not consider safe for them to do.

#### Is Education and Training Alone Enough?

It is a start, but there are other factors to consider as is shown in the case of an employee at a Hay Baling business in Narrogin, who worked as a fork lift and press operator. This employee had been trained to drive a fork lift safely and had a High Risk Work License to operate a fork lift. Part of the training and competency assessment included not driving with the forks raised more than 30 centimeters. Following his training this employee had been warned on at least two occasions by his workplace supervisor not to drive with his forks raised.

On 22nd October the employee had loaded hay bales onto a feed table, reversed away from the table and set off in a forward direction with his forks raised at 1.7 meters high. This caused his view to be obstructed and he hit the driver, seated in another fork lift, with the fork prongs piercing the victim's torso and killing him. The employee was fined (A)11,000 and had to pay 1,745 in court costs (Department of Commerce – WorkSafe. 2017). In this case the employee had been trained to work safely, had been told by his workplace supervisor to work safely, but did not and, as a consequence, accidently killed a fellow employee.

Another case where an employee had been trained to work safely happened in Queensland at the construction site for the ROMA liquefied Natural Gas project when Mr Glenn Newport died at work due to having a cardiac arrest brought on by dilutional hyponatraemia due to heat stress. How to work safely in the heat was discussed at the prestart meeting and strategies to work safely in the heat discussed and implemented prior to Glenn commencing his work for the day. There were workplace policies and procedures that employees had been trained to use to work safely in a hot work environment (Office of the State Coroner. 2016). Despite all of the education and training Glenn, who was 38 years old, was still affected by the heat at his workplace and died.

Similarly, Adam Perttula, a Jumbo machine off sider, was working in a hot, humid underground gold mine in Western Australia when he collapsed due to heat stress and died. Resources Safety (Resources Safety, 2015) Report No. 232 provided an industry alert on preventative action to be taken using the hierarch of risk control measures to prevent further work related deaths due to the same or similar causes. The Resources Safety recommendations for working safely were as follows.

- 1) Elimination. So far as is practicable do not have employees working in the heat.
- 2) Isolation. Isolate heat sources through shielding, containment or using remote control machinery to perform the work where practical.
- 3) Engineering controls, such as providing adequate ventilation to achieve a healthy atmosphere and re-

duce the heat experienced by employees.

- 4) Administrative controls. Use safe work practices such as job rotation.
- 5) Education. Provide training to employees on risk assessment and risk control measures to be taken to avoid any harmful effects from heat.
- 6) Monitor effectiveness of risk control measures used.
- 7) Personal Protective equipment. This is last on the hierarchy of risk control measures and personal protective equipment to protect from the heat is used if the other measures used are not adequate (Resources Safety, 2015).

In this hierarch of risk control measures it is noted that education and training comes after hazard elimination, isolation, engineering controls and administrative controls. As well as using the hierarchy of risk control measures (Resources Safety Resources Safety, 2015) provides information about the role of managers, supervisors and employees in preventing the heat related death of an employee.

The role of managers and supervisors include firstly to ensure all workers are trained to recognise the symptoms of heat stress (Resources Safety, 2015). Then the supervisor should provide detailed safe work practices that identify the hazards and controls for working in hot and humid conditions and ensure that the risk control measures are implemented. 'If the wet bulb temperature exceeds 25°C, an air velocity of not less than 0.5 metres per second must be provided for underground workplaces or in a tunnel under a surge stockpile. Supervisors must also arrange urgent medical treatment for anyone suspected of suffering a heat-related illness' (Resources Safety, 2015, p. 2).

All employees who have to work in a hot climate must understand the risks and symptoms of heat stress, and report any signs of heat stress to their supervisor. Employees also have the responsibility to ensure that they drink appropriate quantities of water to remain hydrated (Resources Safety, 2015).

Using this case study it is clear that it is the workplace management and supervisor's responsibility to ensure that employees have the education and training to be able to work safety and that the employee has the duty to make sure that they understand how to work safely so that they do not harm their own health or the safety and health of others. However education, while very important, is not the only answer. Where hazards exist the hierarch of risk control measures should also be used to make the workplace, work processes and actions of people as safe as is reasonably practicable.

#### Conclusions

Benefits of having education and training to enable employees to have the knowledge to work safely include minimising the number of employee workplace accidents, injuries and work related ill-health and maximising employee productivity due to the fact that employees know how to perform their work correctly and safely (29). Other benefits are reduced legal costs, improved employee work related satisfaction, employee retention, reducing the cost associated with having to recruit and train new employees, reduced employee sick leave and lost work hours, reduced workers' compensation costs, the employer ensuring that they are meeting their legal obligations and responsibility for their employees (38).

The findings of this paper are that work related education and training are a pre-requisite for safety because, as was shown in the Longford Gas Plant disaster, in the Bhopal Union Carbide disaster, and in numerous other accidents, if employees do not have the education and are not trained in how to do their work safety major disasters can occur.

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# **Combating Road Traffic Congestion in Beirut, Lebanon**

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#### Abstract

In the Greater Beirut Area (GBA), there is a high dependency on private car use that has exacerbated road traffic congestion, turning the daily commute into an ordeal for many people. Studies to implement an efficient public transport system to alleviate this problem are underway. However, any new public transport system would face the challenge of attracting private car users to become public transport patrons.

Key Words: Private car use, Traffic congestion, Public transport, Lebanon.

#### Introduction

Since the civil war (1975-1990), there has not really been an efficient public transport infrastructure in place in Beirut due to a lack of funds and, therefore, there is a high dependency on private car use. This high dependency on private car use has seriously exacerbated road traffic congestion, especially in the Greater Beirut Area (GBA), turning the daily commute to the city centre of Beirut into an ordeal for many people. Also, the situation has worsened over recent years, due to the influx of some 1.5 million refugees from neighbouring Syria, who now make up roughly 25% of the resident population in Lebanon, which has led to an increase in road traffic levels of some 15-25% (with some 50% of the households in Lebanon owning one car, and about 25% owning at least two, there is almost one car for every two people in the country (BLOMINVEST BANK, 2015). Further, road traffic congestion is also exacerbated by the fact that many roads are in a poor state of repair.

Whatever public transport there is comes in the form of taxi, minibus and bus services. The bus services are provided either by OCFTC (Office for Railways and Public Transport), a public entity that comes under the tutelage of the Ministry of Public Works and Transport, or by a number of private bus operators. OCFTC receives a subsidy to assist in its provision of the bus services, whilst the private operators exist without any subsidy. The minibuses operate either as communal taxis on popular routes or on a roaming basis, as do taxis. The number of taxis and minibuses is increasing rapidly, giving rise for concern, as it has become clear that they also make a significant contribution to road traffic congestion.

In 2015, the number of daily motorised trips within the Greater Beirut Area (GBA) amounted to some 5,000,000, with about 68% of these journeys made by private car, with an occupancy of 1.6 persons/car (see table, right).

Greater Beirut Area (GBA)			
Population	> 2,000,000		
Daily number of motorized trips	5,000,000		
Share of Daily Number of Motorised Trips Per Transport Mode			
Taxis & Minibuses	15%		
Private Sector Buses	14%		
OCFTC Buses	3%		
Private Cars	68%		

Daily motorized trips–share per transport model (Blominvest Bank, 2015).

# High Private Car Use Road Traffic Congestion and Environmental Impact

The high private car use results in serious road traffic congestion, especially during the peak-hour periods. It also has an environmental impact, as well as financial consequences for the economy (Choueiri, 2015).

#### **Road Traffic Congestion**

The World Bank estimates that some 650,000 vehicles enter the Greater Beirut Area (GBA) on a daily basis, with 300,000 accessing the city via the northern entrance of the Jounieh-Beirut highway, 200,000 via the southern entrance, and 150,000 via the eastern highway – not counting the vehicles already in Beirut (Rahhal, 2019). During the morning peak-hour period (between 6:45 a.m. and 11:00 a.m.) and the evening peak-hour period (between 4:00 p.m. and 7:00 p.m.), road traffic speeds are usually very low, ranging from 30 km/h on main roads to less than 10 km/h on secondary roads, which seriously increases journey times.

During peak-hour periods, traffic on the northern approach to the city centre alone, may reach an hourly high of 7,000 vehicles, with all these vehicles spending hours

jammed on a single north-south artery that runs along the full length of the Mediterranean coast line, and connects Beirut to the cities of Jounieh and Tripoli in the north, and Sidon and Tyre in the south (see Map).



Map of Lebanon (Lonely Planet, 2019)

#### Environmental impact

The high dependency on private car use not only causes road traffic congestion, but also has an environmental impact as regards noise and air pollution.

#### Noise

The road traffic congestion situation is accompanied with unacceptable levels of noise, due to the high traffic density, old vehicle engines and also an excessive use of the claxon. On the main roads of the Greater Beirut Area (GBA), noise levels reaching 90-95 dB have been measured, whereas the standard level is 72 dB. The measured noise levels fall into the category that cause irritation and may well cause health problems.

#### Air pollution

With 25% of  $CO_2$  emissions in the Greater Beirut Area (GBA) coming from the land transport sector, which is estimated to consume about 45% of all imported fuel, the contribution of road traffic to air pollution is very significant. The proliferation of the use of badly run engines on taxi services also greatly contributes to this. The high pollution levels in the Greater Beirut Area (GBA), which has also become one of the most serious deterrents to tourists to visit the city, also lead to high medical costs due illnesses caused by the air pollution.

#### Financial consequences

The cost of the road traffic congestion situation in the Greater Beirut Area (GBA) to the Lebanon's economy is at least a substantial USD 2 billion a year (The Daily Star,

2017). Further, the heavy traffic in the Greater Beirut Area (GBA) also leads to the occurrence of a high number of road accidents, with high inherent costs to the country's economy.

#### The One Hit Solution

It is often suggested that congestion may be solved with one big idea, such as:

- Widen roads
- Narrow roads
- Add bus lanes
- Remove bus lanes
- Build tunnels
- Build a new ring road
- Build a light rail network
- Switch off traffic lights
- Ban cycling
- Ban cars from city centers
- Close through-routes to private vehicles
- Close car parks
- Build more car parks
- Build more park-and-rides
- Make buses free
- Make park-and-ride free
- Introduce a congestion charge/road pricing

None of these solutions can provide a complete solution, and most of them provide only temporary relief until the induced demand replenishes the space available on the road. Road pricing is the closest solution to a one-hit solution, but it still has to be associated with major improvements in public and active transportation options (Leigh, 2016).

Heavy engineering measures, such as bus lanes, trams and tunnels, can attract the support of politicians who value their political futures and political legacies. But such projects typically require years of extremely disruptive work, destroy fragile street landscapes, and compromise the viability of other transit options. Expanding a road to add a dedicated bus lane makes crossing more difficult for pedestrians and may compromise the quality of bike infrastructure, if one exists that can be adapted. A tram line or park-and-ride can cannibalize the clientele of rural bus services. Business cases need to be developed carefully, and only after "soft" measures have been implemented, or at least modelled in detail (Leigh, 2016).

#### Need for an Efficient Public Transport System

Studies to implement an efficient public transport system to alleviate road traffic congestion in Beirut are underway (Choueiri, 2014), as building more roads, demolishing buildings to make space for more cars, and adding more parking spaces will only exacerbate the problem. Decreasing road traffic congestion by developing more roads, for instance, is not a viable option because of Beirut's urban density and terrain, with the mountains to one side, the sea to another, and a narrow coastal strip in-between. Any road development project would need to either expropriate land, or to construct tunnels in mountains or highways over the sea, all of which would be costly options.

In view of the above, developing a reliable public transport system is the only option for reducing traffic congestion. However, for any such system to be conceptualised to accommodate a reasonable ridership on a given corridor, it is essential that the system specifically understands, targets and adapts itself to the current private car users. Once an objective is established, then it can be executed through the levels of subsidy, as well as fare and price discrimination mechanisms.

#### Attracting private car users to travel by public transport

For attracting current private car users, the majority of whom are middle-class professionals, to patronise the public transport system, one should recognise that one of the key variables would be the location of stations. The locations in suburban areas would need to have adequate parking facilities. Most of the commuters would need to park at the station and then use the public transport system to commute into the city.

As regards implementing a public transport system, the following aspects could influence the level of ridership:

- parking fees;
- pedestrian-only zones in the Central Business District;
- bus feeder networks;
- fare and service integration with bus feeder networks;
- park-and-ride facilities at stations;
- level of service and amenities provided.

As for stations in Beirut, it would be very important to address the issue of transport mode transfer, as well as to consider the walking distance from the station to the Central Business District or other destinations in the city. For example, requiring a commuter to use three modes of transport to get to his/her place of work would likely diminish ridership.

Based upon the levels of ridership expected, the system could be sized, such as the number of vehicles required, if there is a need for a single or double-track system, etc. This will then allow the development of a rough estimate of the relative costs of the bus and rail alternatives. This will include both capital and ongoing operating costs. Based upon the comparative costs and other attributes such as the ability to attract additional patronage, contribution to urban development objectives, environmental impact, and other implications of the alternative systems, a preliminary selection of the eligible technologies could then be recommended. It is important to recognise that this would remain a preliminary recommendation until further developments of the study are completed. The intent here is to provide broad system characteristics, including travel speed, capacity, frequency, which would meet the anticipated ridership levels.

#### **Concluding Remarks**

The high dependency on private car use in the Greater Beirut Area (GBA) has seriously exacerbated road traffic congestion, turning the daily commute into an ordeal for many people. The biggest component of road traffic congestion cost is attributable to time wasted on the road, as well as health problems resulting from air pollution, excess fuel consumption, impact on economic productivity, higher cost of rent as people tend to live closer to their jobs, and increased vehicle operating costs. As regards the latter, vehicle operating costs increase because of poor road conditions (Lebanon's roads ranked 124 in terms of quality of roads among 138 countries, i.e. one of the worst, according to the 2016-17 Competitiveness Index of the World Economic Forum (World Economic Forum, 2016). Building more roads, demolishing buildings to make space for more cars, and adding more parking spaces will only make the problem worse. The development of a reliable and efficient public transport system with optimal services and facilities could well attract patronage from current private car users and, thus, alleviate road traffic congestion, as well as enhance mobility and quality of life in the city of Beirut.♦

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# World Safety Organization (WSO)

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 1985 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... Worldwide."

#### World Safety Organization Activities

- WSO publishes WSO Newsletters, World Safety Journal, and WSO Conference Proceedings.
- WSO provides a network program linking various areas of professional expertise needed in today's international community.

WSO develops and accredits educational programs essential to national and international safety and establishes centers to support these programs.

WSO receives proposals from professional safety groups/ societies for review and, if applicable, submits them to the United Nations for adoption.

WSO presents annual awards: The James K. Williams Award, Glenn E. Hudson International Award, J. Peter Cunliffe Transportation Award, Concerned Citizen, Concerned Professional, Concerneady/Corporation, Concerned Organization, Educational Award, WSO Chapter/National Office of the Year, and Award

for Achievement in Scientific Research and Development.

- WSO provides recognition for safety publications, films, videos, and other training and media materials that meet the WSO required educational standards.
- WSO establishes and supports divisions and committees to assist members in maintaining and updating their professional qualifications and expertise.
- WSO has Chapters and National/International Offices located throughout the world, providing contact with local communities, educational institutions, and industrial entities.
- The WSO 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.

#### **Benefits of Membership**

WSO publishes the "WSO Consultants Directory" as a service to its Members and to the Professional Community. Only Certified Members may be listed.

WSO 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, or experience.

- WSO provides a network system to its Members whereby professional assistance may be requested by an individual, organization, state, or country or 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 other resource which may be of assistance.

WSO provides all Members with a Membership Certificate for

display on their office wall and with a WSO Membership Identification Card. The WSO 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 have access to WSO Newsletters and other membership publications of the WSO on the WSO website, and may request hard copies by contacting the WSO World Management Center. Subscription fees apply to certain publications.
- Members are entitled to reduced fees at seminars, conferences, and classes given by the WSO. This includes local, regional, and international programs. When Continuing Education Units (CEUs) 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 issued upon completion of each course.
- Members receive special hotel rates when attending safety programs, conferences, etc., sponsored by the WSO.

#### Membership

The World Safety Organization has members who are full time professionals, executives, directors, etc., working in the safety and accident prevention fields, including university professors, private consultants, expert witnesses, researchers, safety managers, directors of training, etc. They are employees of multi- national 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 Membership: Individuals connected with safety and accident prevention in their work or individuals interested in the safety field, including 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 Membership: Organizations, corporations, agencies, and other entities directly or indirectly involved in safety activities and other related fields. Sustaining/Corporate Member: Individuals, companies, corporations, organizations or other entities and selected groups, interested in the international effort to "Make Safety A Way Of Life...Worldwide."

The WSO Membership Application is included on the following pages and is also available on the WSO website: https://worldsafety.org/application- for-wso-membership/ https://worldsafety.org/quick- downloads/

# World Safety Organization



# **Application for Membership**

[	1	Application Fee	\$20.00 USD
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1	1	Affiliate Membership	\$90.00 U SD
[	1	Institutional Membership*)	\$195.00 USD
1	1	Corporate Membership*)	\$1000.00 USD

\*) In case of institution, agency, corporation, etc., please indicate name, title, and mailing address of the authorized representative.

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If you were referred by someone, please list his/her name(s), chapter, division, etc.:

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- [ ] Occupational Safety and Health (OS&H)
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- [ ] Public Safety/Health (PS&H)
- [ ] Construction Safety (CS)
- [ ] Transportation Safety (TS)
- [ ] Industrial Hygiene (IH)
- [ ] Product Safety (PRO)
- [ ] Risk Management (RM)
- [ ] Hazardous (Toxic) Materials Management (HAZ)
- [ ] Nuclear Safety (NS)
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Annual dues hereafter will be billed and payable on the anniversary date of your membership. **U.S. funds only.** 

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# **Student Membership** Application

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You will receive all member benefits including subscription to WSO World Safety Journal and WSO Newsl etter evoluting access to WSO's Manter Pro

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			[ ] Construction Safety (CS)	
First Name/Given Name	Initial	(Gender)	[ ] Transportation Safety (TS)	
			[ ] Industrial Hygiene (IH)	
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Email Address(es)			Applicant Signature	Date
1			FOR MIDHIGH SCHOOLERS ONY WSO subs	cribes to the Femily Educe
COLLEGE/UNIVERSITY STUDENT			tional Rights and Privacy Act (FERPA) philosoph	ny in protecting student privacy
Category: Undergraduate Graduate/Post-Graduate		and information. WSO may disclose "directory" information such as a student's		
			along with group or individual photos in WSO Ne	wsLetters, NewsFlashes,
Degree(s) Sought/Obtained			eNews, on WSO website, and on WSO's social r	media accounts.
			My student has permission to participate as	outlined above.
Name of College/University Campus			My student has permission to participate w	ith exclusions:
MIDDLE / HIGH SCHOOL STUDENT			9. 	
Lam a Middle Schooler in: D 6th Grade	7th Grade 8th Grade		X	
			Parent/Guardian Signature (Mid/High S	Student) Date

х

[IF APPLICABALE]

WSO Student Chapter Mentor Signature

□ I am a High School: □ Freshman □ Sophomore □ Junior □ Senior

Name of School

Approximate Date of Graduation (MM / YYYY)

(For High School and College/University students, application must include approximate date of graduation to be processed.)

Date

North Pacific Ocean

Ocean

h ic in North Atlantic Ocean United Kingdom

Franc

Algeria

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Mali

by Uzbekista

Saudi

Arabia

Ethiopia

Kazakhstan

Afghanis

Mongolia

China Japan

Philippines

Papua New Guinea

Australia

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# World Safety Organization Code of Ethics

Members of the WSO, by virtue of their acceptance of membership into the WSO, are bound to the following Code of Ethics regarding their activities associated with the WSO:

#### థా•ళ

Members must be responsible for ethical and professional conduct in relationships with clients, employers, associates, and the public.

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Members must be responsible for professional competence in performance of all their professional activities.

#### థా•ళ

Members must be responsible for the protection of professional interest, reputation, and good name of any deserving WSO member or member of other professional organization involved in safety or associate disciplines.

#### థా•ళ

Members must be dedicated to professional development of new members in the safety profession and associated disciplines.

#### **ئە**•ىۋ

Members must be responsible for their complete sincerity in professional service to the world.

#### **يە•**مۇ

Members must be responsible for continuing improvement and development of professional competencies in safety and associated disciplines.

#### థా•ళ

Members must be responsible for their professional efforts to support the WSO motto:

"Making Safety a Way of Life...Worldwide."



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