

The copyright © of this thesis belongs to its rightful author and/or other copyright owner. Copies can be accessed and downloaded for non-commercial or learning purposes without any charge and permission. The thesis cannot be reproduced or quoted as a whole without the permission from its rightful owner. No alteration or changes in format is allowed without permission from its rightful owner.



**THE INFLUENCE OF SAFETY KNOWLEDGE, SAFETY LEADERSHIP, AND
SAFETY MOTIVATION TOWARD SAFETY BEHAVIOR AMONG OFFSHORE
OIL AND GAS EMPLOYEES**

CHING SEA LEE



UUM
Universiti Utara Malaysia

MASTER OF HUMAN RESOURCE MANAGEMENT

UNIVERSITI UTARA MALAYSIA

2017

THE INFLUENCE OF SAFETY KNOWLEDGE, SAFETY KNOWLEDGE, SAFETY
LEADERSHIP, AND SAFETY MOTIVATION TOWARDS SAFETY BEHAVIOR AMONG
OFFSHORE OIL AND GAS EMPLOYEES



By
CHING SEA LEE

UUM
Universiti Utara Malaysia

Thesis Submitted to
Othman Yeop Abdullah Graduate School of Business,
Universiti Utara Malaysia
In Partial Fulfilment of the Requirement for the
Master of Human Resource Management



**THE INFLUENCE OF SAFETY KNOWLEDGE, SAFETY LEADERSHIP, AND
SAFETY MOTIVATION TOWARD SAFETY BEHAVIOR AMONG OFFSHORE
OIL AND GAS EMPLOYEES**

COLLEGE OF BUSINESS, UNIVERSITI UTARA MALAYSIA (UUM)

BY: CHING SEA LEE

MATRIC: 818698

Dissertation submitted to

Othman Yeop Abdullah Graduate School of Business,

Universiti Utara Malaysia,

**in Partial Fulfillment of the Requirement for the Master of Human Resource
Management August 2017**



**Pusat Pengajian Pengurusan
Perniagaan**

SCHOOL OF BUSINESS MANAGEMENT

Universiti Utara Malaysia

PERAKUAN KERJA KERTAS PENYELIDIKAN
(Certification of Research Paper)

Saya, mengaku bertandatangan, memperakukan bahawa
(I, the undersigned, certified that)
CHING SEA LEE (818698)

Calon untuk Ijazah Sarjana
(Candidate for the degree of)
MASTER OF HUMAN RESOURCE MANAGEMENT

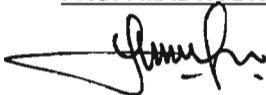
telah mengemukakan kertas penyelidikan yang bertajuk
(has presented his/her research paper of the following title)

**THE INFLUENCE OF SAFETY KNOWLEDGE, SAFETY LEADERSHIP AND SAFETY MOTIVATION TOWARDS
SAFETY BEHAVIOUR AMONG OFFSHORE OIL & GAS EMPLOYEES**


Seperti yang tercatat di muka surat tajuk dan kulit kertas penyelidikan
(as it appears on the title page and front cover of the research paper)

Bahawa kertas penyelidikan tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan.
(that the research paper acceptable in the form and content and that a satisfactory knowledge of the field is covered by the research paper).

Nama Penyelia Pertama : **PROF. MADYA DR. CHANDRAKANTAN SUBRAMANIAM**
(Name of 1st Supervisor)

Tandatangan : 
(Signature)

Nama Penyelia Kedua : **DR. HADZIROH BINTI IBRAHIM**
(Name of 2nd Supervisor)

Tandatangan : 
(Signature)

Tarikh : **17 JULAI 2017**
(Date)

PERMISSION TO USE

In presenting this dissertation/project paper in partial fulfillment of the requirements for a Post Graduate degree from Universiti Utara Malaysia (UUM), I agree that the Library of this university may make a freely available for inspection. I further agree that permission for copying of this dissertation/project paper in any manner, in whole or in part, for scholarly purpose may be granted by my supervisor(s) or in their absence, by the Dean of Othman Yeop Abdullah Graduate School of Business where I did my dissertation/project paper. It is understood that any copying or publication or use of this dissertation/project paper parts of it for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and the UUM in any scholarly use which may be made of any material in my dissertation/project paper.

Request for permission to copy or to make other use of materials in this dissertation/project paper in whole or in part should be addressed to: _____

Dean of Othman Yeop Abdullah Graduate School of Business

University Utara Malaysia

06010 UUM Sintok

Kedah Darul Aman

ABSTRACT

Safety behavior is vital in reducing injuries and accident in the workplace by identifying the workplace hazard, and to combat them to the minimal accident rate. It has positive influence on both employees and employers behavior towards safety and health. This study explored the relationship between safety knowledge, safety leadership, and safety motivation towards safety behavior among offshore oil and gas workers in Terengganu. The information was collected by questionnaire distribution to offshore oil and gas workers and the total numbers of workers responded was 170 out of 300. The finding of this study revealed that safety leadership with respect to safety policy is positively significant with safety behavior. Besides, safety motivation is proven that it has positive significant relationship with safety behavior. Besides, the relationship between safety knowledge and safety compliance has a positively significant relationship between these two variables. Lastly, the results obtained from this study also revealed that there is a positively significant relationship between safety leadership with respect to safety motivation with safety participation. The findings give an insightful information and guidance for researchers and practitioners to identify solutions that can help to improve safety and health at workplace.

Keywords: safety knowledge, safety leadership, safety motivation, safety compliance and safety participation.



UUM
Universiti Utara Malaysia

ABSTRAK

Tingkah laku keselamatan memainkan peranan yang penting dalam hal mengelakkan kecederaan dan kemalangan serta mengenal pasti bahaya di tempat kerja, serta dapat mengurangkan kepada kadar kemalangan yang paling minima. Dan ia mempunyai pengaruh yang positif ke atas kedua-dua pihak, pekerja dan majikan. Kajian ini meliputi hubungan antara pengetahuan keselamatan, kepimpinan keselamatan, dan motivasi keselamatan ke arah tingkah laku keselamatan di kalangan pekerja minyak dan gas luar pesisir di Terengganu. Maklumat tersebut dikumpulkan oleh pendedaran soal selidik kepada pekerja minyak dan gas luar pesisir dan jumlah bilangan maklumbalas yang diterima sebanyak 170 daripada 300. Hasil kajian ini menunjukkan bahawa kepimpinan keselamatan berkaitan dasar keselamatan adalah positif serta signifikan dengan tingkah laku keselamatan. Sebaliknya, motivasi keselamatan terbukti bahawa ia mempunyai hubungan yang signifikan positif dengan tingkah laku keselamatan. Selain itu, hubungan antara pengetahuan keselamatan dan pematuhan keselamatan mempunyai hubungan positif yang signifikan antara kedua-dua pembolehubah. Akhir sekali, hasil kajian ini menunjukkan bahawa terdapat hubungan positif yang signifikan antara kepimpinan keselamatan berkenaan dengan motivasi keselamatan dengan penyertaan keselamatan. Dapatan hasil maklumat yang mendalam serta petunjuk bagi penyelidik dan pengamal untuk mengenal pasti penyelesaian yang boleh membantu untuk meningkatkan keselamatan dan kesihatan di tempat kerja.

Kata Kunci: keselamatan pengetahuan, keselamatan kepimpinan, motivasi keselamatan, pematuhan keselamatan dan penyertaan keselamatan.

ACKNOWLEDGEMENT

My sincere appreciation to my beloved supervisors Dr. Chandrakantan a/l Subramanian and Dr. Hadziroh binti Ibrahim, who have the genuine attitude to pass on their knowledge about research and their concerted effort of giving advice and guidance throughout the whole thesis journey. This dissertation/project paper would not succeed without their guidance and persistent help.

I am so thankful to my beloved husband Mogana Kumara Vel a/l N Thoppasamy for his patience, understanding, as well as his morale support. Moreover, I would also like extend my thanks to the management of the Petronas Carigali Terengganu for the opportunity to let me to collect data from them which is so beneficial to my study.

I owe special gratitude to those person following: Dr Abdelhak Senadjki, Dr Ng Lee Peng, Dr Choong Yuen Oon, Mohd Mazshurrein Nasir, Charles Surendh David, Zailani Dani bin Mat Sahid, Goh Swee Ling, Lam Chee Hong, Habibah Othman, Goh Mei Yong, Siti Aminah Roslan, Wan Muhammad Majdi, Chin Boon Keong, Lionel Keith for their unending support as well as their effort and time to help me in this thesis.

Forget not my family members support especially my lovely mother Khoo Ai Leng and sisters for having faith in me and accompanied me throughout the whole study life.

At last, thanks be to God for His grace and blessing for giving me the strength to endure and not giving up. Amen.

TABLE OF CONTENT

CHAPTER 1 INTRODUCTION

1.1	Background of the study	1
1.2	Problem Statement	5
1.3	Research Objectives	8
1.4	Research Questions	8
1.5	Significance of Study	9
1.6	Scope of Study	11
1.7	Operational Definition	12
1.8	Organization of the Thesis	13

CHAPTER 2 LITERATURE REVIEW

2.1	Introduction	14
2.2	An Overview of Relevant Legislation	14
2.3	Factors Affecting Safety Behavior	15
	2.3.1 Human Factors	15
	2.3.2 Technological Factors	17
	2.3.3 Organizational Factors	17
2.4	Safety Behaviour	19
2.5	Safety Leadership	22
	2.5.1 Safety Leadership with respect to Safety Policy	24
	2.5.2 Safety Leadership with respect to Safety Concern	25
	2.5.3 Safety Leadership with respect to Safety Motivation	26

2.6	Safety Knowledge	30
2.7	Safety Motivation	32
2.8	Social Exchange Theory	33
2.9	Hypotheses Development	35
2.10	Theoretical Framework	36
2.11	Summary	37

CHAPTER 3 METHODOLOGY

3.1	Introduction	38
3.2	Conceptual Definition	38
3.3	Research Approach/Design	40
3.4	Sampling and Sampling Procedure	41
3.5	Research Instrument	42
3.6	Pilot Study	45
3.7	Data Collection Procedure	46
3.8	Data Analysis Technique	46
3.9	Summary	48

CHAPTER 4 RESULTS AND DISCUSSION

4.1	Introduction	49
4.2	Rate of Response	49
4.3	Respondents' Demographic Background	50
4.4	Reliability Analysis	53

4.5	Descriptive Analysis	54
4.6	Pearson Correlation Analysis	55
	4.6.1 Safety Leadership (safety concern, safety motivation, safety policy) and Safety Behaviour (Safety Compliance)	55
	4.6.1.1 Safety Policy and Safety Compliance	55
	4.6.1.2 Safety Concern and Safety Compliance	56
	4.6.1.3 Safety Motivation and Safety Compliance	56
	4.6.2 Safety Knowledge and Safety Compliance	57
	4.6.3 Safety Motivation and Safety Compliance	57
	4.6.4 Safety Leadership (safety concern, safety motivation, safety policy) and Safety Behaviour (Safety Participation)	58
	4.6.4.1 Safety Policy and Safety Participation	58
	4.6.4.2 Safety Concern and Safety Participation	58
	4.6.4.3 Safety Motivation and Safety Participation	59
	4.6.5 Safety Knowledge and Safety Participation	59
	4.6.6 Safety Motivation and Safety Participation	60
4.7	Hypotheses testing for Safety Compliance	62
	4.7.1.1 Safety Policy and Safety Compliance	62
	4.7.1.2 Safety Concern and Safety Compliance	62
	4.7.1.3 Safety Motivation and Safety Compliance	63
	4.7.2 Safety Knowledge, Safety Motivation and Safety Compliance	63
4.8	R Square for Safety Compliance	63
4.9	Hypotheses testing for Safety Participation	65
	4.9.1 Safety leadership (safety policy, safety concern, safety motivation) and safety behavior (safety participation)	65
	4.9.2 Safety Knowledge, Safety Motivation and Safety Participation	65

4.10	R Square for Safety Participation	66
4.11	Summary	68

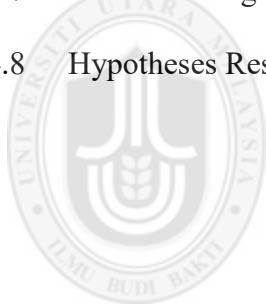
CHAPTER 5 CONCLUSIONG AND RECOMMENDATIONS

5.1	Introduction	69
5.2	Recapitulation of Major Findings	69
5.3	Discussion on Findings	70
	5.3.1 The Relationship between Safety Leadership with respect to Safety Policy	70
	5.3.2 The Relationship between Safety Leadership with respect to Safety Concern	72
	5.3.3 The Relationship between Safety Leadership with respect to Safety Motivation	73
	5.3.4 Safety Knowledge	75
	5.3.5 Safety Motivation	79
5.4	Implication	80
	5.4.1 Theoretical Implication	80
	5.4.2 Managerial Implication	81
5.5	Limitations and Suggestions for Future Study	84
5.6	Summary	85

References

LIST OF TABLES

Table 3.1	Variables	43
Table 3.2	Pilot Study Reliability Test	45
Table 3.3	Rule of Thumb Cronbach-Alpha Coefficient Size	47
Table 4.1	The Response Rate of Survey	49
Table 4.2	Demographic Characteristic of the Respondents	50
Table 4.3	Reliability after Items Deleted	53
Table 4.4	Descriptive Analysis for Main Variables	55
Table 4.5	Pearson Correlation Analysis	61
Table 4.6	Results of Regression Analysis for Safety Compliance	64
Table 4.7	Results of Regression Analysis for Safety Participation	66
Table 4.8	Hypotheses Results	67



LIST OF FIGURE

Figure 2.1 Research Framework



LIST OF ABBREVIATIONS

OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health 1994
SOSCO	Social Security Organization
SPSS	Statistical Package for The Social Science



LIST OF APPENDIXES

Appendix 1: Oil and Gas Industry Accidents Reported to the Labor Department & Social Security Organization (SOSCO), 2010-2014



CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The discovery of oil in Sarawak in the year 1910 marked the beginning of Malaysia's oil and gas industry, an industry that has generated various opportunities for many major oil and gas companies to invest in the upstream and downstream sectors of the industry. This has ultimately provided a wide spectrum of Malaysians ample employment opportunities and skills transfer, thereby altering the economic landscape of the country (Haq, 2014). Along with the progress of Malaysia's Oil and Gas Industry, local companies have had the opportunity to go on to become one of the providers for service which cater the area of exploration as well as production in Malaysia. Moreover, the oil and gas industry in Malaysia also extends their service worldwide. There are much contribution done by Malaysian oil and gas companies based on their competence in giving various services, for instance, process design, electrical instrumentation, oil rigs engineering and much more services. The Malaysian economy is strongly impacted by the oil and gas industry, which has achieved one-fifth of the national GDP over the ten years. The industry is expected to create 52,300 new jobs by 2020 (Matrade, 2016).

Malaysia's oil and gas industry has the second largest ranking for producing the oil and gas in the Association of Southeast Asian Nations (ASEAN), and also one of the world's top LNG (Liquefied natural gas) producers. Being a major contributor to the country's wealth, the Malaysian oil and gas industry has understandably been placed under high scrutiny in the aspect of safety. This makes it an important move to highlight unforeseen

The contents of
the thesis is for
internal user
only

REFERENCES

- Akpan, E. I. (2011). Effective safety and health management policy for improved performance of organizations in Africa. *Management*, 6(3), 159–165. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.472.8114&rep=rep1&type=pdf>
- Aksorn, T., & Hadikusumo, B.H.W. (2008). Critical success factors influencing safety program performance in Thai construction projects. *Safety Science*, 46(4), 709–727.
- Al-Hadir, S., Panuwatwanich, K., & Stewart, R.A. (2015). *Empirical analysis of the impacts of safety motivation and safety climate on safety behavior*. Retrieved from http://www98.griffith.edu.au/dspace/bitstream/handle/10072/54434/86057_1.pdf;jsessionid=D05BAC5C3785DC10162748FB12F05150?sequence=1
- Anderson, M. (2005). Behavioural safety and major accident hazards. *Process Safety and Environmental Protection*, 83(2), 109–116. <https://doi.org/10.1205/psep.04230>
- Antonelli, A., Baker, M., McMahon, A., & Wright, M. (2006). Six SME case studies that demonstrate the business benefit of effective management of occupational health and safety. Research Report 504. HSE Books, Sudbury
- Arboleda, A., Morrow, P.C., Crum, M.R., & Shelley, M. (2003). Management practices as antecedents of safety culture within the trucking industry: similarities and differences by hierarchical level. *Journal of Safety Research*, 34(2), 189–197, doi:10.1016/S0022-4375(02)00071-3
- Authors, F. (2006). Engineering, construction and architectural management article information. Retrieved from AIP Conference Proceedings 1761, 020080. doi: 10.1063/1.4960920
- Aswathappa, K. (2004). *Human resource and personnel management: Text and cases*. (3rd ed.). New Delhi: Tata McGraw–Hill.
- Barling, J., Loughlin, C., & Kelloway, E.K. (2002). Development and test of a model linking safety-specific transformational leadership and occupational safety. *Journal of Applied Psychology*, 87(3), 488-496. doi: 10.1037//0021-9010.87.3.488
- Bass, B., & Avolio, B. (1990). The implications of transactional and transformational leadership for individual, team and organizational development. *Research in Organizational Change and Development*, 4, 231-272. Greenwich, CT: JAI Press.

- Bass, B.M., & Avolio, B.J. (1997). *Full range leadership development: Manual for the multifactor leadership questionnaire*. Palo Alto, CA: Sage.
- Becher, E. C., & Chassin, M. R. (2001). Improving quality, minimizing error: Making it happen. *Health Affairs*, 20(3), 68–81. doi:10.1377/hlthaff.20.3.68
- Blau, P. M. (1964). *Exchange and power in social life*. NY: John Wiley & Sons.
- Boschee, P. (2014). Improving human performance: Tackling the challenges to develop effective safety cultures. *Oil and Gas Facilities*, (June), 23. Retrieved from <https://www.onepetro.org/journal-paper/SPE-0614-0018-OGF>
- CFMEU (Construction, Forestry, Mining and Energy Union) (2005). Submission to the New South Wales Government Mine Safety Review 2004.
- Chen, S., Wang, Y., Yang, Y., & Zheng, X. (2015). Influence of management behavior on the skilled labor migrations unsafe behavior. *Journal of Industrial Engineering and Management*, 8(3), 877-893. doi: <http://dx.doi.org/10.3926/jiem.1397>
- Cheng, E.W.L., Li, H., Fang, D.P., & Xie, F. (2004). Construction safety management: An exploratory study from China. *Construction Innovation*, 4(4), 229–241. doi: 10.1108/14714170410815114
- Choudhry, R.M., Fang, D., & Ahmed, S. (2008). Safety management in construction: Best practices in Hong Kong. *Journal of professional issues in engineering education and practice*. doi: 10.1061/(ASCE)1052-3928(2008)134:1(20)
- Christ, G. (2015). *Safety 2015: The oil and gas industry's death problem*. Retrieved from <http://ehstoday.com/safety-leadership/safety-2015-oil-and-gas-industry-s-death-problem>
- Christian, M.S, Bradley, J.C., Wallace, J.C., & Burke, M.J. (2009). Workplace safety: A meta-analysis of the roles of person and situation factors. *Journal of Applied Psychology*, 94(5), 1103-1127. doi: <http://dx.doi.org/10.1037/a0016172>.
- Cooper, M. D. (1998). *Improving Safety Culture: A Practical Guide*. Wiley: Chichester.
- Cooper, D. (2010). Safety Leadership: Application in construction site. Supplemento A, *Psychology*, 32(1), A18-A23.
- Cordner, L. (2013). Offshore oil and gas safety and security in the Asia Pacific. The need for regional approaches to managing risks. Retrieved from <http://www.rsis.edu.sg/wp-content/uploads/2014/07/Monograph2613.pdf>
- Crichton, M. (2005). Attitudes to teamwork, leadership, and stress in oil industry drilling teams. *Safety Science* 43, 679-696.

- Crocker, M. (1995). The economics of safety management. A paper given to Travers Morgan Ltd at Watford, London, Internal Publication.
- Davis, J. A. (1971). *Elementary survey analysis*. Englewood Cliffs, New York: Prentice Hall.
- DePasquale, J.P., & Geller, E.S. (1999). Critical success factors for behaviour-based safety: A study of twenty industry-wide applications. *Journal of Safety Research* 30 (4), 237–249.
- Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals, *Annual Review of Psychology*, 109-33.
- Evelyn, A.L.T., Florence, Y.Y.Y., & Derrick, S.Y.O. (2005). Fostering safe work behaviour in workers at construction sites, *Journal of Engineering, Construction and Architectural Management*, 12(4), 410-422
- Firth-Cozens, J. (2004). Organisational trust: the keystone to patient safety. *Quality & Safety in Health Care*, 13(1), 56–61. <https://doi.org/10.1136/qshc.2003.007971>
- Fleming, M. (2012). Assessing employee safety motivation. Retrieved from http://www.worksafebc.com/contact_us/research/funding_decisions/assets/pdf/2012/rs2010-dg08.pdf.
- Fraley, C., & Roberts, B. (2005). Patterns of continuity: A dynamic model for conceptualizing the stability of individual differences in psychological constructs across the life course, *Psychological Review*, 112, 60–74.
- Garrett, R.B., & Perry, A.J. (1996). A safer way to move patients. *Occupational Health and Safety* 65 (9), 60–64.
- Gershwin, M. C. (1994). What workplace education programs need to know about behaviour change: Tapping the work of Kurt Lewin. Retrieved from <http://cmapspublic.ihmc.us>
- Ghani, M.K., Abdul Hamid, Z., Mohd Zain, M.Z., Abdul Rahim, A.H., Mohamad Kamar, K.A., & Abdul Rahman, M.A. (2010). Safety in Malaysian construction: The challenges and initiatives. Construction Research Institute Malaysia (CREAM), CIDB Malaysia.
- Gledart, S., Smith, H.S., Shannon, & Lohfeld, L. (2010). Organizational practices and workplace health and safety: A cross-sectional study in manufacturing companies, *Safety Science*, 48, 562–569.
- Gordon, R. (1998). The contribution of human factors to accidents in the offshore oil industry. *Reliability Engineering & System Safety*, 61 (Reliability Engineering and System Safety), 95–108. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0951832098800033>

- Griffin, M.A., & Neal, A. (2000). Perceptions of safety at work: A framework for linking safety climate to safety performance, knowledge, and motivation. *Journal of Occupational Health Psychology, 5*(3), 347-358. <http://dx.doi.org/10.1037/1076-8998.5.3.347>
- Gunningham, N. (2007). *Mine safety: Law, regulation, policy*. Sydney: Federation Press.
- Gyekye, S. A. (2005). Workers' perceptions of workplace safety and job satisfaction. *Journal of International Journal of Occupational Safety and Ergonomics (JOSE), Vol.11*, No. 3, 291-302.
- Hakkinen, K. (1995). A learning-by-doing strategy to improve top management involvement in safety. *Safety Science, 20*(2-3), 299-304. [https://doi.org/10.1016/0925-7535\(95\)00028-F](https://doi.org/10.1016/0925-7535(95)00028-F)
- Haq, N. (2014, October). Malaysia oil and gas industry: A brief legal introduction. Retrieved from <http://www.hhq.com.my/2014/10/malaysias-oil-and-gas-industry-a-brief-legal-introduction/>
- Hassan, C. C., Basha, O. J., & Hanafi, W. W. (2007). Perception of building construction workers towards safety, health and environment. *Journal of Engineering Science and technology, 2*(3), 271-279. Retrieved from <https://scholar.google.com/scholar?q=Perception+of+building+construction+workers+towards+safety%2C+health+and+environment>
- Hinze, J. & Appelgate, L.L. (1991). Costs of construction injuries, *Journal of Construction Engineering and Management*, Vol. 117, no. 3, pp. 537-550.
- Hinze, J., Pedersen, C., & Fredley, J. (1998). Identifying Root Causes of Construction Injuries. *Journal of Construction, 124*(1), 67-71. [https://doi.org/10.1061/\(ASCE\)0733-9364\(1998\)124:1\(67\)](https://doi.org/10.1061/(ASCE)0733-9364(1998)124:1(67))
- Hofmann, D. A., Jacobs, R., & Landy, F. (1995). High reliability process industries: Individual, micro, and macro organizational influences on safety performance. *Journal of Safety Research, 26*(3), 131-149. [http://dx.doi.org/10.1016/0022-4375\(95\)00011-E](http://dx.doi.org/10.1016/0022-4375(95)00011-E)
- Hofmann, D.A., Morgeson, F.P., & Gerras, S.J. (2003). Climate as a moderator of the relationship between leader-member exchange and content specific citizenship: Safety climate as an exemplar. *Journal of Applied Psychology, 88*(1), 170-178. <http://dx.doi.org/10.1037/0021-9010.88.1.170>
- Homans. G.C. (1961). *Social behavior*. NY: Harcourt Brace.
- Hopton, J.G. (1969). Accident prevention in the construction industry, Proceedings of the conference safety on construction sites – Discussion, 12-13 March (1969), The Institution of Civil Engineers, London.

- Hunag, H., Ho, M., Smith, S., & Chen, Y. (2006). Safety climate and self-reported injury: assessing the mediating role of employee safety control. *Accident Analysis and Prevention*, 38, 425–433.
- Hsu, S. H., Lee, C. C., Wu, M. C., & Takano, K. (2008). A cross-cultural study of organizational factors on safety: Japanese vs. Taiwanese oil refinery plants. *Accident Analysis and Prevention*, 40(1), 24–34. <https://doi.org/10.1016/j.aap.2007.03.020>
- Inness, M., Turner, N., Barling, J., & Stride, C.B. (2010). Transformational Leadership and Employee Safety Performance: A Within-Person, Between-Jobs Design. *Journal of Occupational Health Psychology*, Vol. 15, No. 3, 279–290. <http://scihub.cc/http://dx.doi.org/10.1037/a0019380>
- Ismail, F., Torrance, J.V., & Abdul Majid, M.Z. (2007). The reflection of management commitment on OSH within the Malaysia construction organisation. Proceeding of the 10th Conference and Exhibition of National Institute of Occupational Safety and Health (NIOSH), Malaysia, 179-185.
- Johnson, S.E. (2003). Behavioral safety theory: Understanding the theoretical foundation. *Journal of Professional Safety*, 48 (10).
- Kane-Urrabazo, C. (2006). Management's role in shaping organizational culture. *Journal of Nursing Management. Issues in Collaboration in Nursing Management* 14 (3), 188–194
- Kane-urrabazo, C., & Paso, E. (2006). Management 's role in shaping organizational culture. *Journal of Nursing Management*, 14(2000), 188–194.
- Kanten, S. (2013). The relationships among working conditions, safety climate, safe behavior and occupational accidents: An empirical research on the marble workers. *The Microtheme Review*, 2(4), 173-182
- Kapp, A., Smith, M.J., Loushine, T.W. & Hoonakker, P. (2003). Safety and quality management systems in construction: Some insight from contractors. *Journal of Management and Engineering*, 13(5), 70-75.
- Khdair, W. A., Shamsudin, F. M., & Subramaniam, C. (2011). A proposed relationship between management practices and safety performance in the oil and gas industry in Iraq. *World Review of Business Research*, 1(3), 27–45.
- Komaki, J., Heinzmann, A.T., & Lawson, L. (1980). Effect of training and feedback: Component analysis of behavioural safety program. *Journal of applied psychology*, 65(3), 261-270. <http://dx.doi.org/10.1037/0021-9010.65.3.261>
- Laman Web Rasmi Pertubuhan Keselamatan Sosial. Retrieved from <http://www.perkeso.gov.my/my/laporan-tahunan.html>

- Leape, L.L. (1994). Error in medicine. *Journal of the American Medical Association* 272, 1851–1857.
- Leung, M.Y., Chong, A., Ng, S. T., & Cheung, M. C. K. (2004). Demystifying stakeholders' commitment and its impacts on construction projects. *Construction Management and Economics*, 22(7), 701–715. <https://doi.org/10.1080/0144619042000300736>
- Lu, C., & Yang, C. (2010). Safety leadership and safety behavior in container terminal operations, 48, 123–134. <https://doi.org/10.1016/j.ssci.2009.05.003>
- Mahmood, R., Isa, M. M., Mustafa, M., Aziz, F. A., & Salleh, A. (2010). Safety behaviour: The role of safety commitment. In *International Conference on Business and Economic Research (ICBER)* (pp. 15-16).
- Mark, C., & David, C. (2000). Safety training – a special case? *Journal of European Industrial Training*, 24(9), 481-490, doi:10.1108/03090590010358205
- McDonald, N., & Hrymak, V. (2003). Safety behaviour in the construction sector, Report of Health and Safety Authority, Dublin & the Health and Safety Executive, Northern Ireland, 1-82
- Mearns, K., Flin, R., Fleming, M., & Gordon, R. (1997). Human and organizational factors, offshore safety report (OTH 543). HSE Books, Suffolk
- Mearns, K., Whitaker, S.M., & Flin, R. (2003) Safety climate, safety management and safety performance in offshore environments. *Journal of Safety Science*, 41, 641-680 file:///C:/Users/CSL/Downloads/safety%20performance%20offshore.pdf
- Mearns, K., Whitaker, S. M., & Flin, R. (2003). Safety climate, safety management practice and safety performance in offshore environments. *Safety Science*, 41(8), 641–680. [https://doi.org/10.1016/S0925-7535\(02\)00011-5](https://doi.org/10.1016/S0925-7535(02)00011-5)
- Meshkati, N. (2006). Safety and human factors considerations in control rooms of oil and gas pipeline systems: conceptual issues and practical observations. *International Journal of Occupational Safety and Ergonomics: JOSE.*, 12(1), 79–93. <https://doi.org/10.1080/10803548.2006.11076669>
- Minna, P. (2010). *Safety Leadership - Towards Better Safety Performance*. Retrieved from <https://www.prevencionintegral.com/en/canal-orp/papers/orp-2010/safety-leadership-towards-better-safety-performance>
- Mohamed,S. (2003). *Scorecard approach to benchmarking organizational safety culture in construction*. *Journal of Construction Engineering Management* 129 (1), 80-88.
- Moller, L., Pedersen, & Kines, P. (2011). Why do workers work safely? Development of safety motivation questionnaire scales. *Journal of Science Monitor Vol 15* Retrieved from http://ssmon.chb.kth.se/volumes/vol15/10_Pedersen-Kines.pdf

- Mullen, J. (2004). Investigating factors that influence individual safety behavior at work. *Journal of Safety Research*, 35(3), 275–285. <https://doi.org/10.1016/j.jsr.2004.03.011>
- Mullen, J., Kelloway, K., & Teed, M., (2011). Inconsistent style of leadership as a predictor of safety behavior. *Journal of Work and Stress*
- Mthlane, D., Othman, A. A., & Pearl, R. G. (2000). The economic and social impacts of site accidents on the South African society, (1326022687).
- Neal, A., Griffin, M.A., & Hart, P.M. (2000). The impact of organizational climate on safety climate and individual behavior. *Safety Science* 34, 99-109
- Neal, A., & Griffin, M.A. (2002). Safety climate and safety behavior. *Australian Journal of Management* 27, 67-76
- Neal, A.F., & Griffin, M.A. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels. *Journal of Applied Psychology*, 91(4), 946-953. <http://dx.doi.org/10.1037/0021-9010.91.4.946>
- O'Dea, A., & Flin, R. (2001). Site managers and safety leadership in the offshore oil and gas industry. *Safety Science* 37, 39–57. [http://dx.doi.org/10.1016/S0925-7535\(00\)00049-7](http://dx.doi.org/10.1016/S0925-7535(00)00049-7)
- O'Dea, A., & Flin, R. (2003). The Role of Managerial Leadership in Determining Workplace Safety Outcome. Research Report 044, Health & Safety Executive.UK
- O'Toole, M., (2002). The relationship between employees' perceptions of safety and organizational culture. *Journal of Safety Research*, 33, 231-243.
- Panuwatwanich, K., Al-Haadir, S., & Stewart, R. A. (2017). Influence of safety motivation and climate on safety behaviour and outcomes: evidence from the Saudi Arabian construction industry. *International Journal of Occupational Safety and Ergonomics*, 23(1), 60–75. <https://doi.org/10.1080/10803548.2016.1235424>
- Porta, M. (2008). A dictionary of epidemiology. 5th ed. Oxford: Oxford University Press. 320 p
- Probst, T. M., & Estrada, A. X. (2010). Accident under-reporting among employees: Testing the moderating influence of psychological safety climate and supervisor enforcement of safety practices. *Accident Analysis and Prevention*, 42(5), 1438–1444. <https://doi.org/10.1016/j.aap.2009.06.027>
- Richardson, A., & Storr, J. (2010). Patient safety: a literature [corrected] review on the impact of nursing empowerment, leadership and collaboration. *Int Nurs Rev.*, 57(1), 12-21.

- Rivilis, I., Cole, D.C., Frazer, M.B., Kerr, M.S., Wells, R.P., & Ibrahim, S. (2006). Evaluation of a participatory ergonomic intervention aimed at improving musculoskeletal health. *American Journal of Industrial Medicine* 49, 801–810
- Sawacha, E., Naoum, S., & Fong, D. (1998). Factors affecting safety performance on construction sites” *International Journal of Project Management*. Vol.17, pp,309-315.
- Schein, E. (2004). *Organizational culture and leadership*. 3rd edition. Jossey Bass. 437 p.
- Seibokaite, L., & Endriulaitiene, A. (2012). The role of personality traits, work motivation and organizational safety climate in risky occupational performance of professional drivers. *Baltic Journal of Management*, 7(1), 103–118. <https://doi.org/10.1108/17465261211195892>
- Sekaran, U. (2003). *Research methods for business: A skill building approach* (4th ed.). New York: John Wiley & Sons, Inc
- Sekaran, U., & Bougie, R. (2010). *Research methods for business: A skill building approach* (5th ed.). Chichester, West Sussex: John Wiley & Sons, Inc.
- Seppala, A. (1995). Promoting safety by training supervisors and safety representatives for daily safety work. *Safety Science* 20, 317–322
- Sexton, J. B., Thomas, E. J., & Helmreich, R. L. (2001). Error, stress, and teamwork in medicine and aviation: cross sectional surveys. *BMJ: British Medical Journal*, 320(7237), 745.
- Siu, O. L., Phillips, D. R., & Leung, T. W. (2003). Age differences in safety attitudes and safety performance in Hong Kong construction workers. *Journal of Safety Research*, 34(2), 199–205. [https://doi.org/10.1016/S0022-4375\(02\)00072-5](https://doi.org/10.1016/S0022-4375(02)00072-5)
- Simard, M., & Marchand, A. (1994). The behaviour of first-line supervisors in accident prevention and effectiveness in occupational safety. *Safety Science*, 17(3), 169–185.
- Smith, M.J., Cohen, H.H., Cohen, A., & Cleveland, R.J. (1975). On-site observations of safety practices in plants with differential safety performance. In *National Safety Congress Transactions*, Vol.12, National Safety Council, Chicago.
- Subramaniam, C. (2004). Human factors influencing fire safety measures. *Disaster Prevention and Management*, Vol.13, pp.110–116. <http://www.emeraldinsight.com/doi/abs/10.1108/09653560410534243>
- Sulastre, M.Z., & Faridah, I. (2012). Employers’ behavioral safety compliance factors toward occupational, safety and health improvement in the construction industry. *Journal of Social and Behavioral Sciences* 36, 742-751 from file:///C:/Users/CSL/Downloads/Employers%E2%80%99%20Behavioural%20Sa

fety%20Compliance%20Factors%20toward.pdf

- Tam, C.M., Fung, I.W.H., & Chan, A.P.C. (2001). Study of attitude changes in people after the implementation of a new safety management system: the supervision plan. *Construction Management and Economics* 19 (4), 393–403
- Tappen, R. M., Weiss, S. A., & Whitehead, D. K. (2004). Essentials of nursing leadership and management. 3rd.Edition.Philadelphia: EA Davis Company.
- The Official Portal of Malaysia External Trade Development Corporation. (2016) Retrieved from <http://www.matrade.gov.my/en/foriegn-buyers-section/70-industry-write-up--services/547-petroleum-oil-a-gas>
- The Oil & Gas Year The Who's Who of the Global Energy Industryhttp://www.theoilandgasyear.com/content/uploads/2015/04/TOGY_MALAYSIA_2015.pdf
- Uribe, C. L., Schweikhart, S. B., Pathak, D. S., Marsh, G. B., & Fraley, R. R. (2002). Perceived barriers to medical-error reporting: an exploratory investigation. *Journal of Healthcare Management*, 47(4), 263-279.
- Varonen, V., & Mattila, M. (2000). The safety climate and its relationship to safety practices, safety of the work environment and occupational accidents eight wood-processing companies,” *Accident Analysis and Prevention* ,vol. 32, pp. 761–769 , 2000.
- Vijayakumar, T. (2007). Achieve total safety culture through behaviour based safety, Proceeding of the 10th conference and exhibition of National Institute of Occupational Safety and Health (NIOSH), Malaysia, 303-313
- Vinodkumar, M.N, & Bhasi, M. (2010). Safety management practices and safety behavior: Assessing the mediating role of safety knowledge and motivation. *Journal of Accident Analysis and Prevention*, 42, 2082-2093. <http://dx.doi.org/10.1016/j.aap.2010.06.021>
- Vinodkumar, M.N., & Bhasi, M. (2011). A study on the impact of management system certification on safety management. *Safety Science*, 49(3), 498-507.<http://dx.doi.org/10.1016/j.ssci.2010.11.009>
- Vogel, L., & Bester, C. J. (2005). A relationship between accidents types and causes, (July), 233–241.
- Vredenburg, A.G. (2002). Organizational safety: Which management practices are most effective in reducing employee injury rates? *Journal of safety Research*, 33(2), 259-276. [http://dx.doi.org/10.1016/S0022-4375\(02\)00016-6](http://dx.doi.org/10.1016/S0022-4375(02)00016-6)
- Vroom, V.H. (1964). Work and Motivation, Oxford: Wiley.

- Wong, F.K.W, Chan, S.C.M., Tse, R.Y.C., & Love, P.E.D. (2000). Improving safety knowledge through training-The case of Hong Kong. *Journal of Safety Research*, Vol 33(2), 259-276. <http://hdl.handle.net/10397/10112>
- Wu, T.C. (2001). The correlational study between safety climate and safety performance in four categories of manufacturing industries in the Central Taiwan. Dissertation. Taiwan, Republic of China: National Changhua University of Education.
- Wu, T., Chang, S., Shu, C., Chen, C., & Wang, C. (2011). *Journal of Loss Prevention in the Process Industries Safety leadership and safety performance in petrochemical industries: The mediating role of safety climate*, 24, 716–721. <https://doi.org/10.1016/j.jlp.2011.04.007>
- Wu, T.C., Chen, C.H., & Li, C.C. (2007). Correlation among safety leadership, safety climate and safety performance. *Journal of Loss Prevention in the Process Industries* 6(3), 261-272
- Yule, S. (2003). Senior management influences on safety in the UK and US energy sectors. PhD Thesis, University of Aberdeen
- Yule, S., Flin, R., & Murdy, A. (2007). The role of management and safety climate in preventing risk-taking at work. *International Journal of Risk Assessment and Management*, 7(2), 137-151. <http://dx.doi.org/10.1504/IJRAM.2007.011727>
- Zacharatos, A., Barling, J., & Iverson, R. (2005). High-performance work systems and occupational safety,” *Journal of Applied Psychology*, Vol. 90, pp.77–93. Retrieved from <http://sci-hub.cc/http://dx.doi.org/10.1037/0021-9010.90.1.77>
- Zin, Mat, S., & Ismail, F. (2012). Employers’ behavioural safety compliance factors toward occupational, safety and health improvement in the construction industry. *Procedia - Social and Behavioral Sciences* 36 (June 2011): 742–51. doi:10.1016/j.sbspro.2012.03.081
- Zikmund, W. G. (2003). *Business Research Methods*. (7th ed.). South-Western: Thomson Learning
- Zikmund, W. G., Babin, B. J., Carr, J. C. & Griffin, M. (2010). *Business Research Methods*. (8th ed.). South-Western: Cengage Learning
- Zohar, D. (1980). Safety climate in industrial organizations: Theoretical and Applied Implications. *Journal of Applied Psychology* 65, 96-102. Retrieved from <http://sci-hub.cc/http://dx.doi.org/10.1037/0021-9010.65.1.96>
- Zohar, D. (2000). A group-level model of safety climate: testing the effect of group climate on micro accidents in manufacturing jobs. *Journal of Applied Psychology*

- 85, 587–596. Retrieved from <http://sci-hub.cc/http://dx.doi.org/10.1037/0021-9010.85.4.587>
- Zohar, D. (2002). Modifying supervisory practices to improve subunit safety: A leadership-based intervention model. *Journal of Applied Psychology*, 87(1), 156–163. Retrieved from <http://sci-hub.cc/http://dx.doi.org/10.1037/0021-9010.87.1.156>
- Zohar, D., & Luria, G. (2005). A multilevel model of safety climate: Cross-level relationships between organization and group-level climates. *Journal of Applied Psychology*, 90, 616–628. Retrieved from <http://sci-hub.cc/http://dx.doi.org/10.1037/0021-9010.90.4.616>
- Zohar, D. (2010). Thirty years of safety climate research: Reflections and future directions. *Accident Analysis and Prevention*, 42(5), 1517–1522. <https://doi.org/10.1016/j.aap.2009.12.019>



UUM
Universiti Utara Malaysia

Appendix 1

Table 1.1: Oil and Gas Industry Accidents Reported to the Labor Department & Social Security Organization, 2010-2014

Year	Perusahaan/ Industry	Kemalangan dilaporkan Accident reported			HUS dibayar TD Paid			HUK dibayar PD Paid			FOT dibayar DB Paid		
		L/M	P/F	Jumlah	L/M	P/F	Jumlah	L/M	P/F	Jumlah	L/M	P/F	Jumlah
				Total			Total			Total			Total
2014	Pencarian minyak & gas Crude oil & natural gas production	71	12	83	73	9	82	25	1	26	1	0	1
2013	Pencarian minyak & gas Crude oil & natural gas production	49	5	54	41	4	45	11	0	11	3	0	3
2012	Pencarian minyak & gas Crude oil & natural gas production	58	3	61	43	2	45	16	1	17	2	0	2
2011	Pencarian minyak & gas Crude oil & natural gas production	48	4	52	45	4	49	6	1	7	0	0	0
2010	Pencarian minyak & gas Crude oil & natural gas production	38	4	42	27	3	30	4	0	4	0	0	0