

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 MANAGEMENT PRACTICES TOWARDS SAFETY  
PERFORMANCE AMONG INSURED PERSON IN COMMUTING ACCIDENT**

**By**

**MOHAMMED AZMAN B. AZIZ MOHAMMED (808755)**



**Thesis submitted to  
Othman Yeop Abdullah Graduate School of Business, Universiti Utara Malaysia,  
in Fulfilment of the Requirement for Master of Science.**

## Abstract

Safety performance play the crucial role in safety management development at the workplace. It's also contribute the main indicator to the success of accident prevention programme. This study purposely to examine the relationship between safety performance with safety management practise. Theory plan behaviour was applied to develop conceptual framework. In this study safety management practise was independent variable and safety performance was dependent variable. While the safety motivation and employees' competency were mediating variable. Quantitative approach was applied in methodology of this study which involved 615 respondents among insured employees who involved in commuting accident. Regression analysis revealed that safety management practise, safety motivation, and employees' competency have positive relationship significantly with safety performance. Safety motivation and employees' competency was found mediated the relationship between safety management practice and safety performance. This study highlighted the organisation should give priority to improve their safety accident prevention programme by enhance employees' knowledge, skills and abilities. In addition, employees; characteristics should be taken into account during the development of safety training need analysis.

**Keywords:** Safety performance, safety management practise, safety motivation and employees' competency.

## Abstrak

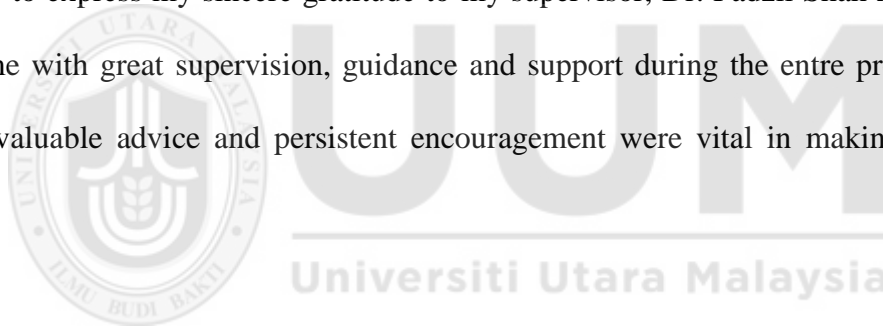
Prestasi keselamatan memainkan peranan penting dalam pembangunan pengurusan keselamatan di tempat kerja. Ia juga menyumbang dan menentukan kejayaan pelaksanaan program pencegahan kemalangan. Dalam kajian ini, teori perancangan gelagat (*Theory of Plan Behaviour*) telah digunakan sebagai asas pembentukan rangka konseptual. Seterusnya amalan pengurusan keselamatan adalah pemboleh ubah bebas manakala prestasi keselamatan merupakan pemboleh ubah bersandar. Disamping itu, motivasi keselamatan dan kompetensi pekerja adalah pemboleh ubah pengantara. Kaedah kuantitatif telah digunakan dalam kajian ini dengan melibatkan 615 responden di kalangan pekerja-pekerja yang berdaftar dengan PERKESO yang terlibat dalam kemalangan semasa ulang-alik ke tempat kerja. Analisa regresi menunjukkan amalan pengurusan keselamatan, motivasi keselamatan dan kompetensi pekerja mempunyai hubungan positif yang signifikan dengan prestasi keselamatan. Kajian ini telah menyarankan bahawa organisasi haruslah member keutamaan dalam meningkatkan program-program pencegahan keselamatan pekerja. Seterusnya, ciri-ciri pekerja haruslah diambil kira dalam proses melaksanakan analisa latihan keselamatan.

**Kata Kunci:** Amalan pengurusan keselamatan, prestasi keselamatan, motivasi keselamatan dan kompetensi pekerja.

## **Acknowledgement**

Alhamdulillah, first and foremost all praises to Allah the most Gracious and the Most Merciful. My humble gratitude to the Prophet Muhammad (Peace be upon him) whose teaching flourished my thoughts and enlightened my heart. I am so grateful to Allah for giving me this opportunity, the strength and ability to finally complete this thesis. I must also thank the government of Malaysia and Universiti Utara Malaysia for their support in making this study possible.

I would like to express my sincere gratitude to my supervisor, Dr. Fadzli Shah Abd Aziz for providing me with great supervision, guidance and support during the entire process of this study. His valuable advice and persistent encouragement were vital in making this thesis reality.



Thanks are also due to many helpful friends, in particular; En Harun Bakar, Mr Dinesh Kumar A/L Saundra Rajan, PERKESO staffs and others who involved directly or indirectly on pursuing my master. I am very thankful to all insured person for their kind cooperation by responding to this study questionnaire.

And finally, but not least, special thanks go to my wife, Datin Wahinah Bt Haroon Rasheed, my sons Muhammad Azmir, Muhammad Azfar and Muhammad Azib, my daughters Nur Wafeeqa and Nur Wafiyah for their endless love, patience and continued support throughout these difficult years of master journey. Thank you very much.

### **Permission to use**

In presenting this thesis in fulfillment of the requirements for a post Graduate degree from Universiti Utara Malaysia (UUM), I agree that the library of university may make it freely available for inspection. I further agree that permission for the copying of this thesis in any manner, in whole or in part, for scholarly purpose may be granted by my supervisor or, in his absence, by the Dean School of Business Management. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is understood that due recognition shall be given to me and to Universiti Utara Malaysia for any scholarly use which may made of any material from my thesis.

Request for permission to copy or to make other use of materials in this thesis, in whole or in part, should be addressed to:



Dean of School of Business Management  
Universiti Utara Malaysia  
06010 UUM Sintok



## TABLE OF CONTENTS

### CHAPTER ONE: INTRODUCTION

1.0 Introduction of the Study	1
1.1 Background of the Study	3
1.2 Problem Statement	6
1.3 Research Questions	8
1.4 Research Objectives	9

### CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction	10
2.1 Safety Management Practise	10
2.2 Safety Performance	15
2.3 Safety Behaviour as safety performance	17
2.4 Safety Motivation	19
2.5 Employees' Competencies	20
2.6 Theoretical Development	21
2.7 Conceptual Framework	23
2.8 Summary	27

## **CHAPTER THREE: METHODOLOGY**

3.0 Introduction	28
3.1 Hypothesis Development	28
3.1.1 Safety Management Practise and Safety Performance	28
3.1.2 Safety Management Practise and Safety Motivation	29
3.1.3 Safety Motivation and Safety Performance	29
3.1.4 Employees' Competency and Safety Motivation	30
3.1.5 Employees' Competency and Safety Performance	30
3.2 Research Design	31
3.3 Operational Definition	32
3.3.1 Safety Management Practise	32
3.3.2 Safety Performance	32
3.3.3 Safety Motivation	32
3.3.4 Employees' Competency	33
3.3.5 Insured Person	33
3.3.6 Commuting Accident	33
3.4 Instrument Development	33
3.4.1 Safety Management Practise	34
3.4.2 Safety Motivation	37



3.4.3 Safety Performance	38
3.4.4 Employees' Competency	39
3.5 Sampling Design	41
3.6 Pilot Test	42
3.7 Summary	44
<b>CHAPTER FOUR: RESULTS AND DISCUSSION</b>	
4.1 Introduction	45
4.2 Data Collection and Processing	45
4.3 Normality Test	47
4.4 Linearity	59
4.5 Descriptive Analysis	61
4.6 Reliability Test of Questionnaire Items	64
4.7 Mean of Variables	65
4.8 Regression Analysis and Hypothesis Testing	66
<b>CHAPTER FIVE: CONCLUSION AND RECOMMENDATION</b>	
5.1 Introduction	70
5.2 Discussion on the Findings against Research Objectives	72
5.3 Implications to the Managers and Organisations	73
5.4 Implications to the Future Researchers	75



5.7 Limitation of the Study	76
5.8 Conclusion	76
<b>REFERENCES</b>	78
<b>APPENDIX</b>	85



## LIST OF TABLES

### Table

1.1	Occupational Accident Reported (Annual SOCSO Report 2012)	4
1.2	Commuting Accident Reported (Annual SOCSO Report 2012)	4
3.1	Stratified Targeted Sample for Sampling	42
3.2	Demographic Profile	43
3.3	The Tested Instruments for Reliability in the Pilot Test	44
4.1	Distribution of Respondent Selection by Area	46
4.2	Data Value for skewness and Kurtosis is Acceptable for the Majority of the Variables if Neither Value Exceeds $\pm 1$	48
4.3	Data Variable Adversely Affected by either Skewness or Kurtosis Statistic Outside $\pm 1.0$ Range	49
4.4	Total Score among Respondents	59
4.5	The Demographic Profile of the Respondents	63
4.6	The Reliability Test of Questionnaire Items	65
4.7	Frequencies of Variables (N=615)	66
4.8	Relationship between Safety Management Practices and Selected Variables	66
4.9	Relationship between Safety Motivation and Safety Performance	67
4.10	Relationship between Employees' Competency and Selected Variables	67
4.11	Regression Analysis on Safety Management and Commuting Accident	68
4.12	Acceptance or Rejection of Stated Hypothesis	69

## LIST OF FIGURES

### Figure

2.1	Theory of Planned Behaviour (Ajzen & Madden, 1986)	22
2.2	Conceptual Framework of Study	25
3.1	Hypothesis Development	30
4.1	Normality Test of Safety Management Practices	49
4.2	Outliers of Safety Management Practice	50
4.3	Normality Test of Safety Performance	51
4.4	Outliers of Safety Performance	52
4.5	Normality Test of Safety Motivation	53
4.6	Outliers of Safety Motivation	54
4.7	Normality Test of Employees' Competency	55
4.8	Outliers of Employees' Competency	56
4.9	Normality Test for Total Score	57
4.10	Outliers for Total Score	58
4.11	Scatter Plot of Regression Standardized Residual	60
4.12	Curve Estimation Plot between Independent and Dependent Variables	61

# CHAPTER 1

## INTRODUCTION

### 1.0 Introduction

Occupational safety issues become more complicated and dynamic due to various systems and operations has have been applied at workplace. According to Goetsch (2008) the application of new technologies and complicated operating systems will create the new hazard situation. Employees and employers should have more awareness of their potential hazard and threats at their workplace for the developing the safe environment. The goal of safety and health programme at the workplace totally to prevent accident and enhance safety performance. The safety culture and safety management practice play the crucial role to enhance safety performance (Griffin & Neal 2000, Zohar 2003, Goetsh 2010). Safety culture is explained through employees' attitude and employee behaviour in the workplace, which related to theirs' knowledge, skills and ability. It's also indirectly reflected the organizational safety goals and performance. The safety activities and accident prevention program need employees' and employers' commitment and involvement (Goetsch, 2010). Due to these potential hazards at the workplace, in February 1994, Malaysia government has been inaugurated the Occupational Safety and Health Act which is a compulsory application to all industries accept shipping and arm forces. (Occupational Safety & Health Act 1994.) Thus, the employers, employees and self-employed have theirs' own responsibilities and duties to prevent the accident at workplace.

The contents of  
the thesis is for  
internal user  
only

## REFERENCES

- Abd Aziz, F. S. (2008). *Safety culture and commitment to safety in the Malaysian railway system*. Doctoral dissertation, University of Nottingham, UK.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. New Jersey: Prentice Hall.
- Ajzen, I., & Madden, T. J. (1986). Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology*, 22, 453-474.
- Anderson, D. R., Sweeney, D. J., & Williams, T. A. (2000). *Quantitative methods for business* (8th ed.). Dallas, Texas: South-Western Educational Publishing.
- APOSHO (Asia Pacific Occupational Safety and Health Organization ) Conference, *Prevention Approach Through Health Promotion: Shaping The Future., 2013*.
- Azir S. (2010), *Safety Behaviour in the Malaysian Petrochemical Industry*. Doctoral dissertation, Universiti Utara Malaysia (UUM), Malaysia.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavior change. *Psychological Review*, 78, 191-215.
- Berge, Z., Verneil, M., Berge, N., Davis, L., & Smith, D. (2002). The increasing scope of training and development competency. *Benchmarking: An International Journal*, 9(1), 43-61.
- Borman, W. C. & Motowidlo, S. J. (1993). Expanding the criterion domain to include elements of contextual performance. *Personnel selection in organization*, 71-98.
- Bowander, B., 1987. The Bhopal accident. *Technological Forecasting and Social Change* 32 (2), 169-182.
- Campbell, J. P. (1990). Modeling the performance prediction problem in industrial and organizational psychology. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed.). 687-732. Palo Alto, CA: Consulting Psychologists Press Inc.
- Campbell, J. P., Gasser, M. B., & Oswald, F. L. (1996). The substantive nature of performance variability. In K. R. Murphy (Eds.), *Individual difference and behavior in organization*. San Francisco: Jossey-Bass.
- Cheyne, A., Cox, S., Oliver, A., & Tomas, M. (1998). Modeling safety climate in prediction of level of safety activity. *Work and Stress*, 12(3), 255-271.
- Cavana, R. Y., Delahaye, B.L., & Sekaran, U. (2001). *Applied business research: Qualitative and quantitative methods*. Sydney: John Wiley and Sons Ltd.

- Ching-Fu Chen & Shu-Chuan Chen (2014). Measuring the effects of Safety Management System practices, morality leadership and self-efficacy on pilots' safety behaviors: Safety motivation as a mediator. *A Journal of Safety Science*.
- Clark, S. (2006). The relationship between safety climate and safety performance: A Meta analytic review. *Journal of occupational health psychology*, 11(4), 315-327
- Cohen, A., 1977. Factors in successful occupational safety programs. *Journal of Safety Research* 9, 168–178.
- Cohen, A., Smith, M., Anger, W., 1979. Self-protective measures against workplace hazards. *Journal of Safety Research* (11), 121–131.
- Cohen, A., Smith, M., Cohen, H.H., 1975. Safety Program Practices in High vs. Low Accident Rate Companies—An Interim Report (questionnaire phase): Department of Health, Education and Welfare Publication No. 75-185. National Institute for Occupational Safety and Health, Cincinnati.
- Cohen, H.H., Cleveland, R.J., 1983. Safety program practices in record-holding plants. *Professional Safety* 28, 26–33.
- Cooper, D. (2009). *The Psychology of Behavioral Safety*. Retrieved on Nov 21, 2009 from <http://www.behavioural-safety.com>
- Cooper, M.D. & Phillips, R.A. (2004). Exploratory analysis of the safety climate and safety behavior relationship. *Journal of Safety Research*, 35, 497-512.
- Cooper, D. (1997). *Improving safety culture: A practical guide*. Chichester, West Sussex, England: John Wiley & Sons Ltd.
- Cooper, D. (1998). *Improving safety culture: A practical guide*. England: John Wiley and Sons Ltd.
- Cohen, H.H., Cleveland, R.J., 1983. Safety program practices in record-holding plants. *Professional Safety* 28, 26–33.
- Cox, S.J., Cheyne, A.J.T., 2000. Assessing safety culture in offshore environments. *Safety Science* 34, 111–129.
- Coyle, I., Sleeman, S., Adams, D., 1995. Safety climate. *Journal of Safety Research* 22, 247–254.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative and mixed methods approach* (2nd ed.), California: Sage Publication Inc.
- Cronbach, L.J., 1951. Coefficient alpha and the internal structures of tests. *Psychometrika* 16, 297–334.
- Davies, F., Spencer, R. & Dooley, K. (2001). *Summary guide to safety climate tools. Offshore Technology Report 1999/063*. MaTSU, Harwell and Didcot, Oxfordshire, OX11 0RA



- Dessler, G, 2011, *Human Resource Management*, 12<sup>th</sup> edition, Upper Saddle River, NJ, Pearson / Prentice Hall.
- DePasquale, J.P., Geller, E., 1999. Critical success factors for behavior-based safety: a study of twentyindustry-wide applications. *Journal of Safety Research* 30, 237–249.
- DeVellis, R. F. (2003). *Scale development: Theory and applications* (2 ed., Vol. 26). Thousand Oaks, California: Sage Publications, Inc.
- De Wit, J.B.F., Stroebe, W., De Vromme, E.M.M., Sandfort, T.G.M., & Van Griensven, G.J.P. (2000). Understanding AIDS preventive behaviour with casual and primary partners in homosexual men: The theory of planned behaviour and the information-motivation-behavioural-skills model. *Psychology and Health*, 15 (3), 325-340.
- Diefendoff, J. M., & Mehta, K. (2007).The relation of motivational traits with workplace deviance.*Journal of Applied Psychology*, 92(4), 967-977
- Dole, W.V., Hurych, J.M., &Liebst, A. (2005). Assessment: A core competency for library leaders. *Library Administration & Management*, 19(3), 125.
- Donald, I, Canter, D., 1994. Employee's attitudes and safety in the chemical industry. *Journal of Loss Prevention in the Process Industries* 7, 203–208.
- Fernandez-Muniz, B., Montes-Peon, J. M., & Vazquez-Ordas, C. J. (2009). Relationship Between Occupational Safety Management and Firm Performance. *Safety Science*, 47 (7), 980-991.
- Flin, R., Mearns, K., O'Connor, P., Bryden, R., 2000. Measuring safety climate: identifying the common features. *Safety Science* 34, 177–193.
- Geller, E. S. (2001).*The psychology of safety handbooks*, Boca Raton, Florida: Lewis Publisher.
- Glendon, A.I, &Litherland, D. K., (2001).Safety climate factors, group differences and safety behavior in road construction.*Safety Science*, 157-188.
- Godin, G., Gagne C., Maziade, J., Moreault, L., Beaulieu, D., & Morel, S. (2001). Breast cancer: The intenention to have a mammography and a clinical examination application of the theory of planned behaviour. *Psychology and health*, 16 (4), 423-441.
- Godin, G., Valois, L., &Desharnais, R. (1992). Predictors of smoking behaviour: an application of Ajzen's Theory of planned behaviour. *British Journal of Addiction*, 87 (9), 1335-1343.
- Goetsch, D.L. (2008). *Occupational safety and health for technologists, engineers and managers. (6th ed.)*. New Jersey: Prentice Hall.

- 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 and Psychology* 5, 347–358.
- Griffiths, D.K., 1985. Safety attitudes of management. *Ergonomics* 28, 61–67.
- Hagan, P.E., Montgomery, J.F., O'Reilly, J.T., 2001. *Accident Prevention Manual for Business and Industry*, 12th ed. NSC, Illinois, USA.
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., & Tatham, R.L. (2006). *Multivariate data analysis*. (6<sup>th</sup> ed.). Upper Saddle River, NJ: Pearson.
- Harper, A.C., Cordery, J.L., de Klerk, N.H., Sevastos, P., Geelhoed, E., Gunson, C., Robinson, L., Sutherland, M., Osborn, D., Colquhoun, J., 1997. Curtin industrial safety trial: managerial behaviour and program effectiveness. *Safety Science* 24, 173–179.
- Hayes, B.E., Perander, J, Smecko, T, & Trask, J. (1998). *Measuring Perception of Workplace Safety : Development and Validtion of the Work Safety Scale*. *Journal of Safety Research*, 29(3), 145-161.
- Hinsz, V. B., Nickell, G. S., & Park, E. S. (2007). The role of Work Habits in the Motivation of Food Safety Behaviors. *Journal of Experimental Psychology: Applied*, 13(2), 105-114.
- Hofmann, D.A., Jacobs, R.R. & Landy, F. (1995). High reliability process industries: Individual, micro and macro organizational influences on safety performance. *Journal of Safety Research*, 26, 131-149.
- Hofman, D. A., & Stetzer, A. (1996). A cross-level investigation of factors influencing unsafe behaviors and accidents. *Personnel Psychology*, 49, 306-339.
- Keppel, G., Saufley, W. H., & Tokunagam, H. (1992). *Introduction to design and analysis: a student's handbook*. Madison Avenue, New York: W. H. Freeman.
- Klehe, U. C., & Anderson, N. (2007). Working hard and working smart: motivation and ability during typical and maximum performance. *Journal of Applied Psychology*, 92(4), 978-992.
- Kirwan, B., 1998. Safety management assessment and task analysis—a missing link? In: Hale, A., Baram, M. (Eds.), *Safety Management: The Challenge of Change*. Elsevier, Oxford, pp. 67–92.
- Komaki, J., Heinzmann, A. T., & Lawson, L. (1980). Effect of training and feedback: Component analysis of a behavioral safety program. *Journal of applied psychology*, 65(3), 261-270.
- Krejcie, R. & Morgan, D. (1970) Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607 – 610.
- Labodova, A., 2004. Implementing integrated management systems using a risk analysis based approach. *Journal of Cleaner Production* 12, 571–580.

Laporanlengkaptahunan SOCSO, 2010.

Lee, T., 1998. Assessment of safety culture at a nuclear reprocessing plant. *Work and Stress* 12, 217–237.

Malarvizhy M. (2012), *Safety Management Practise Towards Safety Performance: A Case Study in A.P.S Medical Sdn. Bhd.*

Marshel, R. (1996). Construction safety. *Occupational safety and health in Malaysia*. 43-54.

Mearns, K., Whitaker, S.M., Flin, R., 2003. Safety climate, safety management practice and safety performance in offshore environments. *Safety Science* 41, 641–680.

McLagan.P.A. (1996). Great ideas revisited: creating the future of HRD. *Training and Development*, 50(1),60-5.

McMillan, J. H., & Schumacher, S. (2001). *Research in education: A conceptual introduction* (5th Ed.). New York, NY: Longman.

M.N. Vinodkumar, M. Bhasi, 2010, *Safety management practices and safety behaviour: Assessing the mediating role of safety knowledge and motivation*, *Accident Analysis and Prevention* 42 (2010) 2082–2093.

Mirabile, R. J. (1997). Everything you wanted to know about competency modeling. *Training & Development*, 51(8), 73-8.

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. (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.

Neal, A., & Griffin, M. A. (2002). Safety climate and safety behavior. *Australian Journal of Management*, 27, 67-76.

Neal, A., & 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.

Nunnally, J. (1978). *Psychometric theory*. (2<sup>nd</sup>ed.). New York : McGraw – Hill

*Occupational Safety and Health Act 1994 and Regulations* (2007). (14th ed.). Ulu Kelang, Kuala Lumpur: MDC Publishers Sdn. Bhd.

Oppenheim, A.N. (2000). *Questionnaire, Design, Interviewing and Attitude Measurement*. London: Continuum.

O’Sullivan, E., Rassel, G., & Berner, M. (2003). *Research methods for public administrator*. Boston: ABlongman.

- Ostrom, L., Wilhelmsen, C., Kaplan, B., 1993. Assessing safety climate. *Nuclear Safety* 34, 163–173.
- Pidgeon, N., 1998. Safety culture: key theoretical issues. *Work and Stress* 12 (3), 202–216.
- Probst, T. M. (2004). Safety and insecurity: Exploring the moderating effect of organizational safety climate. *Journal of Occupational Health Psychology*, 9(1), 3-10.
- Reason, J. T., Parker, D., & Lawton, R. (1998). Organizational controls and safety: The varieties of rule-related behavior. *Journal of Occupational and Organizational Psychology*, 71, 289-304.
- Sekaran, U. (2000). *Research methods for business. A skill-building approach* (3rd ed.). New York: John Wiley & Sons, Inc.
- Smith, M.J., Cohen, H.H., Cohen, A., Cleveland, R., 1975. On-site observations of safety practices in plants with differential safety performance. National Safety Congress Transactions 12 Industrial Subject Sessions 97-103 Cited in Cohen (1977) *ibid*.
- SOCISO- 28<sup>th</sup> APOSHO Conference
- Spencer, L. M. ,& Spencer, S.M. (1993). *Competence and work. Model for superior performance*. New York: Wiley.
- Stephens, S.A., Cole, H.J., Gibbs, K.J., Riehle, C.F., & Weare Jr., W.H. (2009). Developing core leadership competencies for the library profession. *Library Leadership & Management*, 23(2).
- Tinmannsvik, R.K., Hovden, J., 2003. Safety diagnosis criteria—development and testing. *Safety Science* 41, 575–590.
- Vredenburg, A.G., 2002. Organizational safety—which management practices are most effective in reducing employee injury rates? *Journal of Safety Research* 33, 259–276.
- Waller, P. (2001). Public health's contribution to motor vehicle injury prevention. *American Journal of Preventive Medicine*, 2001, 21(4):3–4.
- WHO (1996). Ad Hoc Committee on Health Research Relating to Future Intervention Options. *Investing in health research and development*. Geneva, World Health Organization, 1996 (TDR/Gen/96.2).
- Wikipedia (2008). *Herbert William Henrich*. Retrieved on May 31, 2008 from [http://en.wikipedia.org/wiki/Herbert\\_William\\_Heinrich](http://en.wikipedia.org/wiki/Herbert_William_Heinrich).

Zacharatos, A., (2001). *An organization and employee level investigation of the relationship between high performance work systems and workplace safety*. A published doctoral dissertation, Queen's University Kingston, Ontario.

Zikmund, W. G. (2003). *Business Research Methods*. Mason: Ohio: South-Western.

Zohar, D. (2003). The Effects of Leadership Dimensions, Safety Climate and Assigned Priorities on Minor Injuries in Work Groups. *Journal of Organizational Behavior*, 23 (1), 75-92.

Zohar, D. (1980). Safety climate in industrial organizations: Theoretical and applied implications. *Journal of Applied Psychology*, 1, 96-102.

