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**FACTORS CONTRIBUTING WORKPLACE ACCIDENT IN  
MANUFACTURING INDUSTRY**



**UNIVERSITI UTARA MALAYSIA**

**AUGUST 2020**

**FACTORS CONTRIBUTING WORKPLACE ACCIDENT IN  
MANUFACTURING INDUSTRY**

**By**

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**Thesis Submitted to  
School of Business Management,  
Universiti Utara Malaysia,  
in Partial Fulfilment of the Requirement for Master of Sciences  
(Occupational Safety and Health Management)  
August 2020**



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## ABSTRACT

The purpose of this study is to analyse the factors contributing workplace accident in manufacturing industry. This study is examined the perception of technical workers includes management staffs and non-management staff in the food manufacturing company, MSM Perlis Sdn. Bhd located in Chuping, Perlis on relationship between workplace accident among workers with stress and fatigue, unsafe act, machineries and tools, design of the workplace and training procedure. A total of 137 questionnaires had been distributed to the workers in MSM Perlis Sdn. Bhd. Hypotheses for direct effect were tested using multiple regression analyses. The findings of this study showed that only unsafe act was significantly positive related to workplace accident. On the contrary, stress and fatigue, machineries and tools, design of the workplace and training procedure were not significantly positive related to workplace accident among workers. The findings in this study had provided valuable guidance for researchers and practitioners for identifying solutions that could improved safety and health in manufacturing workplace.

**Keywords:** Workplace accident, stress and fatigue, unsafe act, machineries and tools, design of the workplace, training procedure

## ABSTRAK

Tujuan kajian ini adalah untuk menganalisa faktor-faktor yang menyumbang kemalangan tempat kerja dalam kalangan pekerja dalam industri pembuatan. Kajian ini telah mengkaji persepsi pekerja teknikal termasuk kakitangan pengurusan dan kakitangan bukan pengurusan dalam syarikat pembuatan makanan, MSM Perlis Sdn. Bhd yang terletak di Chuping, Perlis mengenai hubungan antara kemalangan di tempat kerja di kalangan pekerja dengan tekanan dan keletihan, tingkah laku tidak selamat, jentera dan peralatan, reka bentuk tempat kerja serta prosedur latihan. Sebanyak 137 soal selidik telah diedarkan kepada pekerja di MSM Perlis Sdn. Hipotesis ke atas kesan langsung telah diuji menggunakan analisis regresi berganda. Penemuan kajian ini telah menunjukkan bahawa hanya tingkah laku tidak selamat mempunyai hubungan positif yang signifikan terhadap kemalangan tempat kerja. Sebaliknya, tekanan dan keletihan, jentera dan peralatan, reka bentuk tempat kerja serta prosedur latihan tidak mempunyai hubungan positif yang signifikan terhadap kemalangan tempat kerja di kalangan pekerja. Penemuan dalam kajian ini telah memberi panduan berharga bagi penyelidik dan pengamal untuk mengenal pasti penyelesaian yang boleh meningkatkan keselamatan dan kesihatan di tempat kerja pembuatan.

**Kata kunci:** Kemalangan di tempat kerja, tekanan dan keletihan, perbuatan tidak selamat, jentera dan peralatan, reka bentuk tempat kerja, prosedur latihan

## ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Most Merciful. I want to thanks to Allah the Almighty for all the guidance, support and strength giving to me. Alhamdulillah.

First and foremost, I would like to express my deepest gratitude to my supervisor Associate Professor Dr. Mohd Faizal Bin Mohd Isa, for all the energy, care and enthusiasm devoted to this effort. His brilliant ideas, suggestions and above all, their belief in my potential have made me feel confident and gave me a strong focus from the very beginning of my study. Without his professional guidance and support, I would not be where I am today.

A million thanks to the special person in my life that is my beloved mother, Mazanah Binti Brahima, my dearest father, Md Rizal Bin Sidek, my lovely wife, Khairunissa Syairah Binti Ahmad Sohaimi, daughter, Auliya Mahirah Binti Muhammad Nabil Ahnaf, son, Ali Mujahid Bin Muhammad Nabil Ahnaf, all my siblings and friends for their understanding and support in completing this research paper.

Finally yet importantly, I would like to express my gratitude to all employees from MSM Perlis Sdn Bhd for participating in the study. Without their sincere participation, this study will not be as successful as today.

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## LIST OF ABBREVIATIONS

PPE	Personal Protective Equipment
ILO	International Labour Organisation
OSHA 1994	Occupational Safety and Health Act 1994
DOSH	Department of Occupational Safety and Health
SOCSSO	Social Security Organisation
NIOSH	National Institute of Occupational Safety and Health
SMI	Small and Medium scale Industries
GDP	Gross Domestic Product
OSHMP	Occupational Safety and Health Master Plan
HSE	Health, Safety and Environment
WHO	World Health Organisation
SPSS	Statistical Package for the Social Science
VIF	Variance inflation factor
SEDEX	Supplier Ethical Data Exchange
OHSMS	Occupational Health and Safety Management Systems
SOP	Standard Operating Procedure
HIRARC	Hazard Identification, Risk Assessment, and Risk Control

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of Study

According to former chairman of Social Security Organisation (SOCSO) Malaysia which is Tan Sri Dato' Seri Dr. Aseh Bin Haji Che Mat informed that Malaysia showed a solid performance in economic development for 2017 by recording a growth of 5.9% (2016: 4.2%). This growth, supported by domestic demands, mirrors a rapid expansion in private and public sector spending. Similar to other economies in this region, Malaysia benefitted from the comprehensive global recovery with the most rapid increase in gross exports since 2004. The positive overflow from external factors also strengthened domestic demands. This stronger performance is due to higher demands from main trade partners such as China, ASEAN, the European Union, the United States of America and Japan, following the rapid improvement in global technological cycle, investment growth in developed economies and recovery of commodity prices (Social Security Organisation, 2018).

Rapid economic growth through industrialisation has not only had a significant impact on employment, quality of life, but has also contributed to a growing number of workplace accidents (Amirah, Asma, Muda, & Amin, 2013). Malaysia's manufacturing sector is currently expected to expand as a result of increased foreign investment and natural resource consumption. It is anticipated that the growth of manufacturing industries in Malaysia will help create job opportunities and improve the economy to build a high-income country. These rapid developments, however, also means that an even greater risk of accidents and incidents in the workplace can occur (Yeow, Ng, Tan, Chin, & Lim, 2014).

## References

- Ali, A. S., Kamaruzzaman, S. N., & Sing, G. C. (2010). A Study on causes of accident and prevention in Malaysian construction industry. *Journal Design & Built*, 3, 95-104. Retrieved from <https://www.researchgate.net/publication/271203442>
- Abdul Hamid, E. (2017). *Kajian tentang faktor-faktor yang mempengaruhi tingkah laku selamat dalam kalangan pekerja di sektor pembuatan* (master's thesis). Universiti Utara Malaysia, Sintok, Kedah, Malaysia.
- Amirah, N. A., Asma, W. I., Muda, M. S., & Amin, W. M. (2013). Safety culture in combating occupational safety and health. *Asian Social Science*, 9, 3-9. doi:10.5539/ass.v9n3p182
- Annuar, S. S. (2019, July 10). Kemalangan di tempat kerja tidak boleh dianggap kebiasaan. *Berita Harian*. Retrieved from <https://www.bharian.com.my/berita/nasional/2019/07/583458/kemalangan-di-tempat-kerja-tidak-boleh-dianggap-kebiasaan>
- Astley, R.W. and Lawton, R.H. (1971). *The ergonomic aspects of fork lift truck design*. Bedfordshire, Cranfield Institute of Technology.
- Bandura, A., & Abrams, K. (1986). *Self -regulatory mechanisms in motivating, apathetic, and despondent reaction to unfulfilled standards*. Unpublished manuscript. Stanford University, Stanford, California.
- Beasley, D. (2011). The most common causes of workplace injuries: Protecting employees. *Safety Science*, 11(9), 1-9. Retrieved from <http://www.articlesnatch.com/Article/Machinery-Accidents-In-The-Workplace>.
- Bhatti, A. W., Hee, C. H., & Sundram, P. V. (2013). *A guide for beginners: Data analysis using SPSS and Amos*. Kuala Lumpur: Pearson Malaysia Sdn Bhd.
- Bird, F. E. J., & Germain, G. L. (1985). *Practical loss control leadership*. Loganville, Georgia: International Loss Control Institute, Inc.

- Booth, R.T. (1979). Making factories safe for fork lift truck drivers. *Occupational Health*, 2, 193 - 197.
- British Standards Institution (2000). *Occupational health and safety management systems -Guidelines for the implementation of OHSAS 18001*. London: BSI publications.
- Brown, K.A., (1996). Workplace safety: A call for research, *Journal of Operations Management*, 14, 157-171.
- Carrillo-Castrillo, J., Rubio-Romero, J., & Onieva, L. (2015). Causation of severe and fatal accidents in the manufacturing sector. *International Journal of Occupational Safety and Ergonomics*, 19(3), 423–434.
- Chao, E. L., & Henshaw, J. L. (2002). *Hand and power tools*. Washington: U.S. Government Printing Office.
- Chua, Y. P. (2014). *Statistik penyelidikan lanjutan: Ujian regresi, analisis faktor dan analisis sem*. Malaysia: McGraw Hill (Malaysia) Sdn Bhd.
- Coakes, S. J., & Steed, L. G. (2007). *SPSS: Analysis without anguish: Version 14.0 for Windows*. Milton, Qld: John Wiley & Sons Australia.
- Dacanay, M. (2011). Understanding and preventing industrial accidents. *Safety Science*, 8(10), 8-15. Retrieved from <http://www.articlesnatch.com/Article/Machinery-Accidents-In-The-Workplace>.
- De dobbeleer, N., & Beland, F. (1991). A safety climate measure for construction sites, *Journal of Safety Research*, 22, 97 – 103.
- Department of Occupational Safety and Health. (2008). *Guideline for hazard identification, risk assessment, and risk control (HIRARC)*. Malaysia.
- Department of Occupational Safety and Health. (2011). *Guideline on occupational safety and health management systems*. Cheras, Selangor, Malaysia: Mashi Publication Sdn. Bhd.

- Department of Occupational Safety and Health Malaysia. (2016). *Strategic plan for occupational safety and health in small and medium industry sector 2016 - 2020*. Selangor, Malaysia: Mashi Publication Sdn. Bhd.
- Department Of Occupational Safety and Health Malaysia. (2019). *Statistik kemalangan pekerjaan negara tahun 2018*. Retrieved from Official Website Department Of Occupational Safety And Health Malaysia: <http://www.dosh.gov.my/index.php/download/analisis-kkp/3238-infografik-kemalangan-pekerjaan-2018/file>
- Department of Statistics Malaysia. (2019). *Laporan sosioekonomi negeri Perlis 2018*. Putrajaya: Department of Statistics Malaysia.
- Dobson, A., Brown, W., Ball, J., Powers, J. & McFadden, M. (1999). Women drivers' behaviour, socio-demographic characteristics and accidents. *Accident Analysis and Prevention*, 31, 525-535.
- DuPont.(1991). *Managing safety: Operations managers' safety training resource manual*. Pittsburgh
- DuPont.(1995).*Safety training observation program for supervision: Unit 1 introduction*: Pittsburgh
- European Commission. (2013). *Causes and circumstances of accidents at work in the EU*. Retrieved from <https://osha.europa.eu/fop/czech-republic/en/statistics/files/causes.pdf>.
- Gliner, A. J., Morgan, A. G., & Leech, L. N. (2009). *Research methods in applied settings: An integrated approach to design and analysis*. New York: Taylor & Francis Group, LLC.
- Goetsch, D. L. (2015). *Occupational safety and health for technologist, engineers, and managers* (8th ed.). (V. R. Anthony, Ed.) Edinburgh Gate, Harlow, England: Pearson Education Limited .
- Gyekye, S.A. (2010). Occupational safety management: The role of causal attribution. *International Journal of Psychology*, 45 (6), 405–416.

- Hair, J.F., Babin, B., Money, A.H., & Samouel, P. (2003). *Essential of Business Research Methods*. U.S.A: John Wiley & sons, Inc.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2009). *Multivariate data analysis* (7th ed.). New Jersey: Prentice Hall.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective* (7th ed.). New Jersey: Prentice Hall.
- Hakkanen, H., & Summala, H. (2000). Driver sleepiness-related problems, health status and prolonged driving among professional heavy-vehicle drivers. *Transportation Human Factors*, 2 (2), 151-171.
- Heinrich, H.W., D. Petersen, and N. Ross. (1980). *Industrial accident prevention* (5th ed.). McGraw-Hill, New York.
- Horberry, T., Larsson, T.J., Johnston, I. and Lambert, J. (2004). Forklift safety, traffic engineering and intelligent transport systems: a case study. *Applied Ergonomics*, 35 (6), 575-581.
- HSE. (1999). *Reducing error and influencing behaviour* (2nd ed.). Boston: Health and Safety Series Booklet HS
- HSE (2005), *HSE and workplace transport*. Retrieved from <http://www.hse.gov.uk/workplacetransport/hsewpt.htm>.
- HSE (2004). *Working together to reduce stress at work: A guide for employees*. Retrieved from <http://www.hse.gov.uk/stress/standards/pdfs/leaflet.pdf>.
- Idris, R. (2019, August 26). Kadar kemalangan di tempat kerja membimbangkan - Kulasegaran. *Berita Harian*. Retrieved from <https://www.bharian.com.my/berita/nasional/2019/08/600295/kadar-kemalangan-di-tempat-kerja-membimbangkan-kulasegaran>
- International Labour Organisation. (2013). *Safety and health in the use of machinery*. Retrieved from International Labour Office. Geneva: [www.ilo.org/publn](http://www.ilo.org/publn)
- James, K. & Arroba, T. (1999), *Energizing the workplace: a strategic response to stress*. Aldershot, Brookfield, VT: Gower.

- Joel, L. (1997). *The handbook of maintenance management*. New York: Industrial Press
- Katsakiori, P., Kavvathas, A., Athanassiou, G., Goutsos, S., & Manatakis, E. (2010). Workplace and organizational accident causation factors in the manufacturing industry. *Human Factors and Ergonomics in Manufacturing & Service Industries*, 20 (1), 2-9.
- Kifle, M., Engdaw, D., Alemu, K., Sharma, H. R., Amsalu, S., Feleke, A., & Worku, W. (2016). Work related injuries and associated risk factors among iron and steel industries workers in Addis Ababa, Ethiopia. *Safety Science*, 63, 211-216.
- Kirkcaldy, B., van den Eeden, P., Trimpop, R. & Martin, T. (1999). Modelling psychological and work-situation processes that lead to traffic and on-site accidents, *Disaster Prevention and Management*, 8 (5), 342-350.
- Kumar, M., Abdul Talib, S., & Ramayah, T. (2013). *Business research methods*. Oxford
- Larsson, T.J., & Rechnitzer, G. (1994). Forklift trucks-analysis of severe and fatal occupational injuries, critical incidents and priorities for prevention. *Safety Science*, 17(8), 275-289
- Lazarus, R.S. & S. Folkman, (1984). *Stress, appraisal and coping* (1st ed.), Springer, New York
- Leigh, J. (1992). *Costs of occupational injuries & illnesses*. United States: University of Michigan Press.
- Male, G.E. (2003). *Safety of industrial lift trucks: A survey of investigated accidents and incidents (April 1997 – March 2001)*. (No. 60) Health and Safety Executive, Special Inspector
- Marmaras, N., & Nathanael, D. (2005). *Handbook of human factors & ergonomics* (3rd ed.). New York: John Wiley & Sons.
- Miller, B.C. (1988). Forklift safety by design. *Professional Safety Journal*, 2, 18-21.

- MSM Corporate Communications. (2017). *MSM Perlis Sdn Bhd - MSM Malaysia Holdings Berhad*. Retrieved from MSM Malaysia Holdings Berhad: <http://www.msmsugar.com/msm-perlis/profile/corporate-profile>
- Muhammad, A.R. (2015). *Examining factors related to safety behavior in Malaysian manufacturing industry*. (Master's thesis). Universiti Utara Malaysia, Sintok, Kedah, Malaysia.
- Nenonen, S. (2011). Fatal workplace accidents in outsourced operations in the manufacturing industry. *Safety Science*, 30, 94–140.
- Noor, H. M., & Ibrahim, R. (2008). A framework for measurement of human's fatigue level using 2 factors (eyelid blinking and mouth yawning). *International Conference on Computer and Communication Engineering*, 2, 414-418.
- Norris, F.H., Matthews, B.A. & Riad, J.K. (2000). Characterological, situational and behavioural risk factors for motor vehicle accidents: a prospective evaluation. *Accident Analysis and Prevention*, 32, 505-515.
- Oi, W.Y. (1974). On the economics of industrial safety. *Law and Contemporary Problems*, 38(4), 669-699.
- OSHA 1994. (2006). *Guidelines on Occupational Safety and Health Act 1994 (ACT 514)*. Retrieved from <http://www.dosh.gov.my/index.php/legislation/guidelines/general/598-05-guidelines-on-occupational-safety-and-health-act-1994-act-514-2006/file>
- Payne, N. (2011). Machinery accidents in the workplace. *Safety Science*, 10(7), 10-19 Retrieved from <http://www.articlesnatch.com/Article/Machinery-Accidents-In-The-Workplace>.
- Rahim A. H. (2008). Causes of accident at construction sites Malaysia. (Unpublished master's thesis). Universiti Teknologi Malaysia, Skudai, Johor, Malaysia
- Ratnasingam, J., Loras, F., Swan, T. T., Yoon, C. Y., & Thanasegaran, G. (2011). Determinants of occupational accidents in the woodworking sector: The case

of the Malaysian wooden furniture industry. *Journal of Applied Sciences*, 3, 561-566. doi:10.3923/jas.2011.561.566

Saari, J. (1998). Accident prevention. In J. M. Stellman (Eds.), *Encyclopaedia of occupational health and safety 4th ed.* (pp. 1-42). Geneva, Switzerland: International Labour Office.

Said, S. M., Halim, Z. A., & Said, F. (2012). Workplace injuries in Malaysian manufacturing industries. *Occupational Safety & Health* 9, 1-6.

Schneider, B., & Rentsch, J. (1988). Managing Climates and cultures: A future perspective. In J. Hage (ed). *Futures of organisations: Innovating to adopt strategy and human resources to rapid technological changes* (pp. 181-200). Lexington MA.

Sekaran, U. & Bougie, R. (2016). *Research Methods For Business - A Skill Building Approach* (7 ed.). United Kingdom: John Wiley & Sons, Limited.

Shannon, H.S., Mayr, J., & Haines, T., (1997). Overview of the relationship between organizational and workplace factors and injury rates, *Safety Science*, 26 (3), 201-217.

Sharpe, M. and Wilks, D. (2002). ABC of psychological medicine, *British Medical Journal*, 325, 480-483.

Sneddon, A., Mearns, K., & Flin, R. (2013). Stress, fatigue, situation awareness and safety in offshore drilling crews. *Safety Science*, 56, 80-88.

Social Security Organisation. (2018). Retrieved from Annual Report 2017:  
<http://www.perkeso.gov.my/en/report/annual-reports.html>

Soehod, K., & Laxman, L. (2007). *Law on Safety and Health in Malaysia*. Fakulti Pengurusan dan Pembangunan Sumber Manusia, Universiti Teknologi Malaysia.

Stemson, J. (2000). Fork lifts: why training is crucial. *Occupational Safety and Health*, 30 (7), 23-26.

- Stephen, D. (2015). Data Screening using SPSS for beginner: Outliers, missing values and normality. *Institute of Borneo Studies Workshop Series*, (2)3, 14-19
- Storbakken, R.L. (2002). *An incident investigation procedure for use in industry*. (Unpublished master's thesis). University of Wisconsin-Stout, Menomonie, United States
- Accidents at work being covered up. (2017, May 18). *The Star Online*. Retrieved from <https://www.thestar.com.my/news/nation/2017/05/18/accidents-at-work-being-covered-up/>
- Toft, Y., Dell, G., Klockner, K. K., & Hutton, A. (2012). Models of causation: Safety. In HaSPA (health and safety professionals alliance), *The Core Body of Knowledge for Generalist OHS Professionals*. Tullamarine, VIC. Safety Institute of Australia Ltd.
- Trimpop R, Kirkaldy B, Athansou J., & Cooper C., (2010), Individual differences in working hours, work perceptions and accident rates in veterinary surgeries, *Work Stress*, 14, 181- 188.
- Williams, E.A. & Priestley, S.E. (1980). Fork lift truck injuries. *Journal of the Society of Occupational Medicine*, 30, 149-152.
- Yaacob, N. A. (2019, July 26). Role of employers in Vision Zero campaign. *The Star Online*. Retrieved from <https://www.thestar.com.my/opinion/letters/2019/07/26/role-of-employers-in-vision-zero-campaign>.
- Yeow, J. A., Ng, P. K., Tan, K. S., Chin, T. S., & Lim, W. Y. (2014). Effects of stress, repetition, fatigue and work environment on human error in manufacturing industries. *Journal of Applied Sciences* 14 (24), 3464-3471.
- Yulia, A., Salleh, M. M., Noorazman, M. A., & Roslan, U. A. (2015). Safety culture and its contributing factors in manufacturing workplace in Malaysia. *International Journal of Applied Business and Economic Research*, 13(7), 5819-5827.

- Zakaria, N. H., Mansor, N., & Abdullah, Z. (2012). Workplace accident in Malaysia: most common causes and solutions. *Business and Management Review*, 2(5), 75 – 88. Retrieved from <http://www.businessjournalz.org/bmr>
- Zhang, M., Jiang, H., Aw, A., Li, H., Tan, C. L., & Li, S. (2008). A tree sequence alignment-based tree-to-tree translation model. *Proceedings of ACL-08: HLT*, 105, 559–567. Columbus, Ohio: Association for Computational Linguistics. Retrieved from <https://www.aclweb.org/anthology/P08-1064>.





## **APPENDIX A – Questionnaire**

**UUM**

**Universiti Utara Malaysia**



**MASTER OF SCIENCES**  
**(OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT)**  
**UNIVERSITI UTARA MALAYSIA**

Saudara/saudari,

Anda telah terpilih untuk memberi maklumat yang berkaitan dengan kajian mengenai **“Factors Contributing Workplace Accident In Manufacturing Industry.”** Tujuan utama kajian ini dijalankan adalah untuk menilai dan mengenalpasti faktor-faktor yang boleh menyumbang kepada kemalangan tempat kerja dikalangan para pekerja industry pembuatan **“MSM Perlis Sdn. Bhd.”**

Justeru itu, saya memohon jasa baik saudara dan saudari untuk memberi kerjasama dalam memberikan maklumat yang berkaitan secara jujur dan berterus-terang. Segala maklumat yang saudara dan saudari berikan akan **DIRAHSIAKAN**. Anda tidak perlu menulis nama anda.

Kerjasama yang saudara dan saudari berikan saya dahului dengan ucapan ribuan terima kasih.

**TERIMA KASIH**

**Part A: Respondents Personal Profile/ Bahagian A: Profil Peribadi Responden.**

Please tick ( / ) the answer that is relevant to your position.

Sila tanda ( / ) pada jawapan yang bersesuaian dengan jawatan anda.

<b>Department/Station (Jabatan)</b>		Production		Engineering Service
		Logistic		Boiler
		Quality Control		Others :
<b>Gender (Jantina)</b>		Male (Lelaki)		Female (Perempuan)
<b>Race (Bangsa)</b>		Malay (Melayu)		Indian (India)
		Chinese (Cina)		Others (Lain-lain)
<b>Age (Umur)</b>		20 years and below (20 tahun ke bawah)		31 – 40 years (31 – 40 tahun)
		21 – 30 years (21 – 30 tahun)		41 years and above (41 tahun ke atas)
<b>Position (Jawatan)</b>		Manager (Pengurus)		Assistant Manager (Penolong Pengurus)
		Senior Engineer/Executive (Jurutera/Pengawai Kanan)		Engineer / Executive (Jurutera / Pengawai)
		Foreman/Supervisor (Penyelia)		Technician (Juruteknik)
		Clerk (Kerani)		Operator (Operator)
<b>Education Level (Tahap pendidikan)</b>		Standard 6/UPSR (Darjah 6/UPSR)		Diploma (Diploma)
		SRP/PMR (SRP/PMR)		Degree (Ijazah Sarjana Muda)
		SPM (SPM)		Master Degree (Ijazah Sarjana)
		STPM (STPM)		Others (Lain-lain)
<b>Years of service (Tempoh perkhidmatan)</b>		Less than 5 years (Kurang dari 5 tahun)		11 to 15 years (11 hingga 15 tahun)
		6 to 10 years (6 hingga 10 tahun)		15 years above ( 15 tahun ke atas)
<b>Monthly Income (Pendapatan)</b>		Less than RM 1000 (Kurang dari RM 1000)		RM 1000 to RM 3000 (RM 1000 hingga RM 3000)
		RM 3000 to RM 5000 RM 3000 hingga RM 5000)		More than RM 5000 (Lebih dari RM 5000)

To what extent do you agree or disagree with the following statements about your organisation? Please circle one number on each line that best describes your opinion. *Saya ingin mengetahui sebanyak mana anda bersetuju atau tidak dengan setiap kenyataan berkaitan organisasi anda. Sila tandakan ( / ) pilihan jawapan yang terbaik pada pandangan anda. Hanya satu jawapan sahaja untuk setiap soalan.*

Strongly disagree <i>Sangat tidak bersetuju</i>	Disagree <i>Tidak bersetuju</i>	Moderate <i>Sedang</i>	Agree <i>Bersetuju</i>	Strongly agree <i>Sangat Bersetuju</i>
1	2	3	4	5

**Part B: Workplace Accident**  
*(Bahagian B: Kemalangan Tempat Kerja)*

1. There are workplace accident report for every 6 month <i>Terdapat laporan kemalangan di tempat kerja setiap 6 bulan</i>	1 2 3 4 5
2. There are workplace accident report annually <i>Terdapat laporan kemalangan di tempat kerja setiap tahun.</i>	1 2 3 4 5
3. Workplace accidents is one of the major problems that concerns the management of the company <i>Kemalangan di tempat kerja adalah salah satu masalah utama yang membimbangkan pengurusan syarikat.</i>	1 2 3 4 5
4. By practicing prioritization in safety at workplace, accidents can be avoided. <i>Dengan mengutamakan keutamaan dalam keselamatan di tempat kerja, kemalangan boleh dielakkan.</i>	1 2 3 4 5
5. I found that methods of solving accidents has been conducted effectively by the management. <i>Saya mendapati bahawa kaedah menyelesaikan kemalangan telah dijalankan dengan berkesan oleh pihak pengurusan..</i>	1 2 3 4 5
6. Company's mission cannot be achieved because of workplace accidents. <i>Misi syarikat tidak dapat dicapai kerana kemalangan di tempat kerja.</i>	1 2 3 4 5

**Part C: Stress and Fatigue**  
*(Bahagian C: Tekanan dan Keletihan)*

1. Stress and fatigue is one of the factors that contribute to workplace accidents. <i>Tekanan dan keletihan adalah salah satu faktor yang menyumbang kepada kemalangan tempat kerja.</i>	1 2 3 4 5
2. Irregular schedule can cause workplace accidents. <i>Jadual tidak teratur boleh menyebabkan kemalangan di tempat kerja.</i>	1 2 3 4 5

3. Hot weather can cause stress for me to conduct my tasks properly. <i>Cuaca panas boleh menyebabkan tekanan bagi saya menjalankan tugas saya dengan betul.</i>	1 2 3 4 5
4. I have to complete a lot of task every day <i>Saya perlu menyelesaikan banyak tugas setiap hari</i>	1 2 3 4 5
5. I have to work hard and extra time in order to achieve target that has been set by the company. <i>Saya perlu bekerja keras dan masa tambahan untuk mencapai sasaran yang telah ditetapkan oleh syarikat..</i>	1 2 3 4 5
6. I'm willing to work in stress and fatigue in order to earn more income. <i>Saya bersedia bekerja dalam tekanan dan keletihan untuk mendapatkan lebih banyak pendapatan.</i>	1 2 3 4 5
<b>Section D: Unsafe Act</b> <b><i>(Bahagian D: Perlakuan tidak selamat)</i></b>	
1. I have to follow all the safety regulations that has been stated by the company. <i>Saya perlu mengikut semua peraturan keselamatan yang telah dinyatakan oleh syarikat.</i>	1 2 3 4 5
2. Before starts working, I ensure that all the safety equipment are properly wore <i>Sebelum mula bekerja, saya memastikan bahawa semua peralatan keselamatan dipasang and dipakai.</i>	1 2 3 4 5
3. If I'm exhausted, I will ask for permission to get some rest before continuing my job in order to avoid accident happens. <i>Jika saya letih, saya akan meminta izin untuk berehat sebelum meneruskan tugas saya untuk mengelakkan kemalangan berlaku.</i>	1 2 3 4 5
4. I will ensure my health status is on best condition before starts working. <i>Saya akan memastikan status kesihatan saya dalam keadaan terbaik sebelum mula bekerja..</i>	1 2 3 4 5
5. I will ensure to give full concentration towards the tasks given. <i>Saya akan memastikan untuk memberikan tumpuan penuh ke atas tugas yang diberikan.</i>	1 2 3 4 5
<b>Section E: Machinerries/Tools</b> <b><i>(Bahagian E: Jentera / Peralatan)</i></b>	
1. I will operate machinerries/tools according to rules that has been stated. <i>Saya akan mengendalikan jentera / alat mengikut peraturan yang telah dinyatakan.</i>	1 2 3 4 5

2. Before starts working, I will ensure that all machineries are in good condition. <i>Sebelum ia mula berfungsi, saya akan memastikan semua jentera dalam keadaan baik.</i>	1 2 3 4 5
3. If there are damages happen to the machineries/tools, I will immediately report to the responsible parties. <i>Sekiranya terdapat kerosakan pada jentera / alatan, saya akan segera melaporkan kepada pihak yang bertanggungjawab.</i>	1 2 3 4 5
4. In completing task that requires long hours of machineries/tools usage, I will perform double checking to ensure it is safe to use the machineries/tools. <i>Dalam menyelesaikan tugas yang memerlukan masa penggunaan jentera / alat yang lama, saya akan melakukan pemeriksaan berganda untuk memastikan ia selamat menggunakan jentera / alat.</i>	1 2 3 4 5
5. I will ensure that I have enough training before operate machineries/tools <i>Saya akan memastikan bahawa saya mempunyai latihan yang cukup sebelum mengendalikan jentera / alatan.</i>	1 2 3 4 5
6. I will not continue my task if there is minor damage to the machineries/tools even though I've been asked to complete the task. <i>Saya tidak akan meneruskan tugas saya jika terdapat kerosakan kecil kepada jentera / alat walaupun saya telah diminta untuk menyelesaikan tugas itu.</i>	1 2 3 4 5
7. To ensure smoothness in operation, I will ensure all machineries maintenance is under schedule and properly done. <i>Untuk memastikan kelancaran dalam operasi, saya akan memastikan semua penyelenggaraan jentera berada di bawah jadual dan dilakukan dengan betul.</i>	1 2 3 4 5
<b>Section F: Design of the Workplace</b> <b>(Bahagian F: Reka Bentuk Tempat Kerja)</b>	
1. Improper design of workplace can cause difficulties for me in completing my tasks well. <i>Reka bentuk yang tidak betul di tempat kerja boleh menimbulkan kesukaran bagi saya untuk menyelesaikan tugas saya dengan baik.</i>	1 2 3 4 5
2. I will continue my daily tasks as asked even though there is no safety features in design of workplace. <i>Saya akan meneruskan tugas harian saya seperti ditanya walaupun tidak ada ciri keselamatan dalam reka bentuk tempat kerja.</i>	1 2 3 4 5
3. I will discuss with top management if there are poor design of workplace that can cause difficulties in completing daily tasks. <i>Saya akan berbincang dengan pengurusan atasan jika terdapat reka</i>	1 2 3 4 5

<i>bentuk tempat kerja yang tidak baik yang boleh menyebabkan kesukaran menyelesaikan tugas harian.</i>	
4. Responsible officers that handle the design of workplace are able to explain clearly about the safety in design of workplace. <i>Pegawai yang bertanggungjawab yang mengendalikan reka bentuk tempat kerja dapat menjelaskan secara jelas mengenai keselamatan dalam reka bentuk tempat kerja.</i>	1 2 3 4 5
5. Proper design of workplace will ensure safety in machineries operation. <i>Reka bentuk yang betul di tempat kerja akan memastikan keselamatan dalam operasi jentera.</i>	1 2 3 4 5
<b>Section G: Training Procedure</b> <b>(Bahagian G: Prosedur Latihan)</b>	
1. Lack of training among worker cause accidents. <i>Kekurangan latihan di kalangan pekerja menyebabkan kemalangan.</i>	1 2 3 4 5
2. I need more training to ensure precision in handling tasks given. <i>Saya memerlukan lebih banyak latihan untuk memastikan ketepatan dalam menangani tugas yang diberikan.</i>	1 2 3 4 5
3. Effectiveness of training given help me a lot in completing the task well without any accident. <i>Keberkesanan latihan yang diberikan membantu saya dalam menyelesaikan tugas dengan baik tanpa sebarang kemalangan.</i>	1 2 3 4 5
4. I need to be exposed to programs and seminars that related to safety to ensure good result in work and produce quality in job without any accidents. <i>Saya perlu didedahkan kepada program dan seminar yang berkaitan dengan keselamatan untuk memastikan hasil yang baik dalam kerja dan menghasilkan kualiti kerja tanpa sebarang kemalangan.</i>	1 2 3 4 5
5. I need direction from the supervisors about the best safety methods to achieve work quality. <i>Saya memerlukan arahan daripada penyelia mengenai kaedah keselamatan terbaik untuk mencapai kualiti kerja.</i>	1 2 3 4 5
6. Supervisors need to be exposed more on safety handling methods at workplace. <i>Penyelia perlu didedahkan lebih lanjut mengenai kaedah pengendalian keselamatan di tempat kerja.</i>	1 2 3 4 5
7. By practicing serious training on safety perfectly, workplace accident can be avoided. <i>Dengan mengamalkan latihan serius mengenai keselamatan dengan sempurna, kemalangan di tempat kerja boleh dielakkan.</i>	1 2 3 4 5

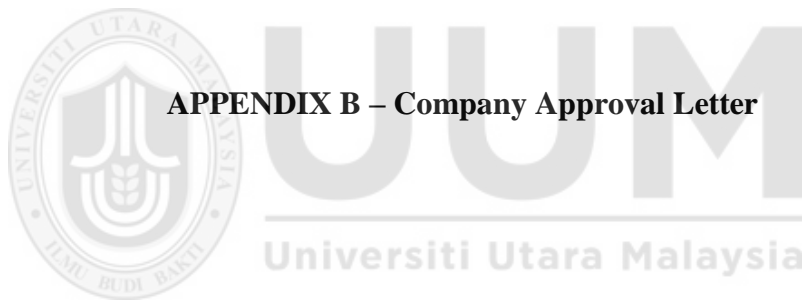
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**TERIMA KASIH ATAS KESUDIAN ANDA MELUANGKAN MASA  
MENJAWAB  
KAJI SELIDIK INI.**

**RESPON ANDA DAPAT MEMBANTU DALAM MENANGANI ISU  
KEHILANGAN PENDENGARAN PEKERJA DI SYARIKAT ANDA.**

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**APPENDIX B – Company Approval Letter**

Muhammad Nabil Ahnaf Bin Md Rizal  
Sekolah Pengajian Siswazah Perniagaan Othman  
Yeop Abdullah  
Universiti Utara Malaysia  
06010 UUM Sintok, Kedah

1 Jun 2020

Asmawy Bin Ariffin  
Pengurus Besar-Operasi  
MSM Perlis Sdn Bhd  
02500 Kangar, Perlis

Tuan,

**Permohonan Kelulusan Mengedar Soal Selidik di MSM Perlis Sdn Bhd**

Saya Muhammad Nabil Ahnaf Bin Md Rizal sedang berkhidmat sebagai pemangku penolong pengurus jabatan pengeluaran di MSM Perlis Sdn Bhd dan sedang menjalankan kajian sebagai syarat menamatkan pengajian ijazah sarjana saya di UUM.

2. Sehubungan dengan itu saya memohon jasa baik pihak tuan untuk meluluskan permohonan saya untuk mengedar soal selidik di MSM Perlis Sdn Bhd. Beserta surat ini saya kepilkan soal selidik dan kertas kerja kajian tersebut. Turut disertakan surat kelulusan daripada pihak UUM.

Kerjasama dan keprihatinan pihak tuan saya didahului dengan jutaan terima kasih.

Yang benar,

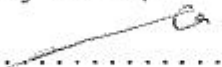
  
.....

(MUHAMMAD NABIL AHNAF BIN MD RIZAL)  
0169345271

.....

Saya Asmawy Bin Ariffin meluluskan/~~tidak meluluskan~~ permohonan Muhammad Nabil Ahnaf B Md Rizal untuk mengedar soal selidik di MSM Perlis Sdn Bhd.

Yang Benar,

  
.....

ASMAWY BIN ARIFFIN  
General Manager - Operation  
MSM PERLIS SDN. BHD.