



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LOW BACK PAIN ANALYSIS IN ALUMINIUM INDUSTRY

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree of Manufacturing Engineering (Manufacturing Management)

by

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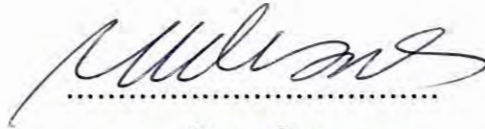
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DECLARATION

I hereby, declared this report entitled “Low Back Pain Analysis in Aluminium Industry” is the results of my own research except as cited in references.

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ABSTRAK

Kajian ini membincangkan tentang masalah “low back pain”. Kajian ini akan dijalankan di Leow Brothers (LB) Aluminium Berhad. Syarikat ini merupakan pembuat and pengedar untuk aluminium. Di syarikat ini, pekerja menghadapi masalah “low back pain” yang serious untuk menyelesaikan kerja. Dalam kajian ini akan mencadangkan penyelesaian dan membina situasi kerja yang selamat. “Low back pain” (or lumabago) ialah satu masalah otot yg menyebabkan 80% orang mengalaminya. Kajian ini juga akan merangkumi kesan, sebab dan jenis “low back pain”. Terdapat beberapa sebab kepada “low back pain” seperti kerja fizikal, pengendalian secara manual, bongkok, trauma, pertambahan kerja dan sebagainya. Persamaan NIOSH digunakan sebagai cara untuk menganalisis masalah “low back pain”. Persamaan NIOSH merupakan satu penyelesaian ergonomic yang boleh digunakan untuk mendapatkan berat yang disarankan untuk kerja tersebut. Terdapat level dimana yg diperlukan of “lifting index” iaitu diterima, memerlukan perubahan, dan tidak boleh diterima. Nilai – nilai “lifting index” yang diperolehi daripada keputusan akan dibandingkan to mengetahui keperluan and level untuk masalah tersebut. Selepas membuat analisis keputusan tersebut, cadangan dibuat untuk mengurangkan masalah “low back pain”. Cadangan untuk rekabentuk rak akan di cadangkan. Rekabentuk yang baru berpandukan cirri-ciri yang sesuai untuk mengurangkan “low back pain”. Kemudian, kesimpulan untuk keseluruhan kajian ini akan dibuat.

ABSTRACT

In this research discusses about the low back pain problem. This research will take place at aluminum industry which is Leow Brothers (LB) Aluminium Berhad. The company is one of the larger manufacturer and supplier for the aluminum product. At this company, the workers face the serious low back pain problem while complete their task. This research will propose a solution and creates the safe working environment for the workers. Low back pain (or lumbago) is a common musculoskeletal disorder affecting 80% of people at some point in their lives. It accounts for more sick leave and disability than any other medical condition. This research also will cover about the effect, causes and the type of the low back pain. There are some causes of the low back pain such as heavy physical work, manual handling, bending, trauma, increasing work and so on. The NIOSH lifting equation is used as the method to analyze the problem of low back pain. NIOSH Lifting Equation is an ergonomics assessment tool that can be used to calculate the recommended weight limit for two-handed manual-lifting tasks. There are there level of the requirement of lifting index which is acceptable, indicates changes and unacceptable hazardous. The value of the lifting that gather from the result will compare to the requirement to know which group the problem will be. After make analyze of the result, make the suggestion to reduce the low back pain problem. The propose design for the mill finish rack will be proposed. The new design that make is according to the criteria that can reduce the problem. Then, conclusion for overall of the research made to conclude the research.

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Specially dedicated to my beloved parents, En. Musa bin Ahmad and Zainab binti Mohamad, whose care, unconditional love and sacrifice resulted in where I stand today. There are the best parents in the world – true blessings from God, indeed!!!

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LIST OF ABBREVIATIONS

LB	Leow Brothers
LBP	Low Back Pain
RWL	Recommended Weight Limit
OSHA	Occupational Safety and Health
CTD	Cumulative Trauma Disorder
RMS	Repetitive Motion Syndromes
LI	Lifting Index
Etiologies	The branch of medicine that deals with the causes or origins of disease.
FCE	Flos Chrysanthemi
RTW	Return to Work
BC	Before Christ
NHC	National Health Service
HIV	Human Immuno-deficiency Virus
MF	Mill Finish
FG	Finish Good

CHAPTER 1

INTRODUCTION

This chapter contains of background of study, problem statement, objectives, scope of study and writing structure. After start the research, all contains in this chapter is very important to identify.

1.1 Background of Study

Leow Brothers (LB) Aluminium Berhad is an aluminium company industry located at Beranang, Selangor Darul Ehsan. The company produces aluminium products from the raw material. The product produced have two categories which is light and heavy weight. The production activities at Leow Brothers (LB) involve manual material handling to transfer the material. The company does not use any mechanical material handling to remove the raw material or work in progress (WIP). The weight of the material lifted, frequencies at lifting and duration of lifting may pose to low back pain (LBP) problem.

Low back pain (or lumbago) is a common musculoskeletal disorder affecting 80% of people at some point in their lives. It accounts for more sick leave and disability than any other medical condition. It can be either acute, sub acute or chronic in duration. Most often, the symptoms of low back pain show significant improvement within a few weeks from onset with conservative measures.

Most cases of lower back pain are due to benign musculoskeletal problems and are referred to as non specific low back pain. They are generally believed to be due to

a sprain or strain in the muscles of the back and the soft tissues, especially if the pain arose suddenly during physical load to the back, and the pain is lateral to the spine. The rate of serious causes is less than 1%.

The workers at LB transfer the product called profile frequently every day. The profile also have the different weight depends on the design of the profile and their length. Out of the eight hours of the working hour, the workers only give one hour for the rest time. So, the management currently do not aware whether the workers have problem about the low back pain or not. The time that they had taken to complete their task also must be considered because it can help to know whether they face the problem or not in their routine to complete the task that had given by the company.

1.2 Problem Statement

In this company, the workers have to load and unload the material that called profile. The activities occurred at packing process. The profile was heavy and need to be loaded for the packing process without any machine used. Due to the nature of work at LB Company, the workers need to transfer the material (profile) to other workstation. Current situation the management does not equipped the workers with mechanical manual handling. The workers take rest for about an hour from 8.30 a.m to 4.00 p.m. These activities may pose to low back pain problem. Low back pain may damage the musculoskeletal system. The damages will affect directly the productivity and competitive edges of the in individual worker, the company and the nation.

1.3 Objectives

In this study, there are some objectives that want to be achieved at the end of the research. The objectives are:

1. To identify the low back pain problem in packaging department at LB Aluminium Company.

2. To analyze the result from the data collection.
3. To propose a solution in reducing the risk of low back pain.

1.4 Scope of Study

In this study will capture the average of weight performed in loading and unloading the material (profile). The frequencies of lifting during working time in a day, the amount of rest provide, the way the workers performed the job including the postures. the task covered about the low back pain problem while lifting process. The study will identify the low back pain that the workers faced. This study involves some calculation such as Recommended Weight Limit (RWL) as a standard to benchmark.

1.5 Writing Structure

CHAPTER 1 – In this chapter, discussed about background of the project, problem statement, objectives, scope of study, and writing structure. For the chapter one is the introduction for the project. This chapter tells about the whole report.

CHAPTER 2 – In this chapter, discussed about the literature review. For the literature review, need to summarize the journals about fatigue in industry. There are many problem occurred based on the fatigue. There also must summarize and find the solution for the fatigue problem from the journals.

CHAPTER 3 – In this chapter, discussed about the methodology. The methodology is the step and method was used to complete the report. In this part, the flow chart from the beginning until the end of the project. This part also discussed the method used to cover the fatigue problem.

CHAPTER 4 – The results that gather will discuss in this chapter. From the result, can analyze whether the workers have face the low back pain problem or not. The NIOSH lifting equation has been used to calculate the lifting index.

CHAPTER 5 – In this chapter, the suggestion and recommendation to reduce the low back pain problem will propose. The new material handling will be proposed to reduce the problem.

CHAPTER 6 – The conclusion from the research will be concluding. Can see whether the objective is achieved or not.

CHAPTER 2

LITERATURE REVIEW

In this chapter is all about the literature review of low back pain. The discussion is about the causes, effect and the types of low back pain. This all information is gain from the journal, conference paper and so on. The research that done by the other people is important to review.

2.1 Ergonomics

The term ‘ergonomics’ is derived from two Greek words: ‘ergon’, meaning work and ‘nomoi’, meaning natural laws. Ergonomists study human capabilities in relationship to work demands. Ergonomics is the study of how working conditions, machines and equipment can be arranged in order that people can work with them more efficiently. For example as computers are probably the most ubiquitous type of machine in today’s work and learning environments, the issue of ergonomically sound interaction with them has come to the fore. In general, computers are clean, quiet and safe to use. However, poor interaction with and positioning of computer equipment can lead to health problems, such as eyestrain, swollen wrists and backache. Problems can be avoided by good workplace design and by good working practices. Prevention is easiest if action is taken early through effective analysis of each workstation.

Ergonomics is a science concerned with the ‘fit’ between people and their work. It puts people first, taking account of their capabilities and limitations. Ergonomics aims to

make sure that tasks, equipment, information and the environment suit each worker. To assess the fit between a person and their work, ergonomists have to consider many aspects. These include such as the job being done and the demands on the worker, the equipment used (its size, shape, and how appropriate it is for the task), the information used (how it is presented, accessed, and changed), the physical environment (temperature, humidity, lighting, noise, vibration), and the social environment (such as teamwork and supportive management).

Ergonomists consider all the physical aspects of a person, such as body size and shape, fitness and strength, posture, the senses, especially vision, hearing and touch, and the stresses and strains on muscles, joints, and nerves. Ergonomists also consider the psychological aspects of a person, such as mental abilities, personality, knowledge, and experience.

There are some ways or method that can use. By applying ergonomics to the work place, it can help to reduce the problem. The benefits are like reduces the potential for accidents, reduces the potential for injury and ill health, and improves performance and productivity. Ergonomics can reduce the likelihood of an accident. For example, in the design of control panels such as the location of switches and buttons - switches that could be accidentally knocked on or off might start the wrong sequence of events that could lead to an accident, expectations of signals and controls - most people interpret green to indicate a safe condition. If a green light is used to indicate a 'warning or dangerous state' it may be ignored or overlooked, information overload - if a worker is given too much information they may become confused, make mistakes, or panic. In hazardous industries, incorrect decisions or mistaken actions have had catastrophic results.

Ergonomics can also reduce the potential for ill health at work, such as aches and pains of the wrists, shoulders and back. Consider the layout of controls and equipment; these should be positioned in relation to how they are used. Those used most often should be