FEASIBILITY STUDY AND REDESIGN FEW MODULES OF THE EXISTING FIRE FIGHTING MACHINE

NOOR ZAIEDURRA IRDAWATIE BT NORDIN

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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NOOR ZAIEDURRA IRDAWATIE BT NORDIN

This report is submitted to the Faculty Mechanical Engineering in partial to fulfill the requirement for Bachelor Mechanical Engineering (Design and Innovation)

FACULTY OF MECHINCAL ENGINEERING
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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"I verify that, I have read this report and from my opinion this thesis have fulfill the scope and quality requirement for Bachelor Mechanical Engineering (Design and Innovation)"

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Date : ……

"I hereby declared that this report is a result of my own work except for the works that have been cited clearly in the references."

Signature : ……

Name : Noor Zaiedurra Irdawatie Bt Nordin

Date : ……...

My parents, family, supervisor and friends.

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ABSTRAK

Projek ini bertujuan untuk menghasilkan rekabentuk-rekabentuk terbaik bagi memenuhi aspek-aspek rekabentuk yg perlu pada mesin melawan kebakaran yg telah sedia ada di Universiti Teknikal Malaysia Melaka (UTeM). Projek ini merangkumi kajian terhadap rekabentuk yg sempurna untuk mesin tersebut bagi setiap komponen bahagian yang telah di kenal pasti. Ia adalah satu proses penambahbaikan dari segi keselamatan mesin tersebut. Rekabentuk Morfologi dijanakan bagi mendapat konsep-konsep rekabentuk yang sesuai bagi setiap komponen bahagian yang telah di kenal pasti. Bagi mendapatkan rekabentuk terbaik bagi mesin ini, kaedah pemberat digunakan bagi memastikan rekabentuk tersebut adalah terbaik di kalangan semua rekabentuk konsep yang telah diilhamkan. Melalui rekabentuk yang telah dipilih, rekabentuk teperinci akan dijanakan. Analisis akan dijalankan terhadap rekabentuk yang telah dipilih melalui kaedah pemberat.Selepas analisis dijalankan, keputusan akan diperolehi.

ABSTRACT

This project aim is to generate the best design to fulfill the design requirements on the existing fire fighter machine that created by Universiti Teknikal Malaysia Melaka (UTeM). This project includes the study on the design that suitable for the existing fire fighter machine on the safety requirement. The designs are intended to improve the function of the machine on safety side. Morphology design were made to create the appropriate design concepts of the parts component that been identified. Weighted-Rating method been used to evaluate the entire designs. Detail design will be specified and the analysis on the champion design is made. After the potential designs are choose, several analyses will be carried out on the design. The analysis will shown the result that produce from the analysis.

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ABBREVIATION

FKM	Fakulti Kejuruteraan Mekanikal
OSHA	Occupational Safety & Health Act 1994
NIOSH	National Institute of Occupational Safety and Health
SHO	Safety and Health Officer
CIMAH	Control of Industrial Major Accident Hazards
USECHH	Standard of Exposure of Chemical Hazardous to Health
DOSH	Department of Occupational Safety and Health
UTeM	Universiti Teknikal Malaysia Melaka

CHAPTER 1

INTRODUCTION

1.1 Background

'Projek Sarjana Muda' (PSM) is a compulsory for all student of UTeM in order to obtain a degree in the engineering field. From the PSM, every student will apply their subject learned from the classes into the final project. There are many applications that have to do such as theoretical, experimental, analysis, design and so on. Objective of this project is to produce professional and efficient graduate to complete engineering problem by literature and scientific study through research approach and development and through application of knowledge were studied and knowledge from some other field those concerning.

Firefighters are rescuers extensively trained primarily to put out hazardous fires that threaten civilian populations and property to rescue people from car accidents, collapsed and burning buildings and other such situations. Some of the situation, there needs tools in rescuing people and saving the properties. Fire fighting machine is one of the solution that available in the market. Several problems that encounter in the existing fire fighting machine is the system not efficiently works and helping in the real situation.. Fire fighting machine is usually used to reduce the flame of fire. For the existing fire fighting machine, its can be applied in the small burning building and not for a large burns.

This project is purposely to improve the existing fire fighting machine in order to redesign and study the feasibility of the machine. There need to have several solutions in improving the product. By applied the design knowledge, a new and efficient fire fighting machine can be produced.

1.2 Problem Statement

There are several problems that occur while testing and maintaining the existing fire fighting machine which created by UTeM and joint venture of a company in Langkawi. Some of the problems occurred were:

1.2.1 Pipe Connection

In the safety order, the pipe connection loaded with high water pressure. In this particular case, safety precaution should be taken, if the connection is suddenly unplugged due to these high water pressures.

1.2.2 Impact Absorber

In the existing of fire fighting machine, the nozzle will give a high impact and sound to the stopper when it goes down. The objective of improving this part is to reduce the sound after the nozzle hit the stopper.

1.2.3 Control Panel Drawer

For this part, the problem that may occur is the electrical and electronic parts might expose to the short circuit because the possibility of the water entering the compartment is high. Since the electrical and electronics compartment is difficult to view, therefore it is hard to detect if these problems occurred.

1.2.4 Battery Compartment

The purpose of improving the battery compartment is because the existing battery compartments have the difficulty while maintaining the batteries. There should have few options in servicing the batteries.

1.2.5 Motor Compartment

This compartment has the problem while the machine is operating. The water will flood to this compartment and it wills consequence to the damages of the motor if the water traps continuing to happen.

These problems need a new improvement to be designed that suitable for the system of the existing fire fighting machine which then can be applied on the real situation.

1.3 Purpose

The aim of this project is to improve and redesign a few modules of the existing fire fighter machine.

1.4 Objective

The objectives are to improve few modules of the fire fighting machine especially on the new design for few modules and analyze every part that has been improved.