



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**IMPLEMENTATION OF SAFETY DIVIDER DOWNHILL
ROAD WITH THE TRANSMUTATION CONCEPT**

This report is submitted in accordance with the requirement of the University Technical Malaysia Melaka (UTeM) for the Bachelor of Electrical Engineering Technology (Industrial Power) with Honours.

by

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I hereby, declared this report entitled “Implementation of Safety Divider Downhill Road With The Transmutation Concept” is the results of my own research except as cited in references.

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APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Electrical Engineering Technology (Industrial Power) with Honours. The member of the supervisory is as follow:

.....
(Puan Nurul Ashikin binti Mohd Rais)

ABSTRAK

Tenaga yang boleh diperbaharui adalah tenaga yang dikumpulkan daripada pembaharuan tenaga seperti cahaya matahari, angin, hujan, dan ombak. Selain itu, pembaharuan tenaga juga mencipta dan menghasilkan empat tenaga yang penting di kawasan pembekalan elektrik, udara, air dan tenaga kerja. Selain daripada itu, tenaga bantuan adalah satu tenaga yang boleh dikitar semula digunakan untuk menghasilkan elektrik bagi kegunaan setiap hari. Seperti yang kita tahu, gas asli seperti minyak adalah sesuatu tenaga yang tidak boleh diperbaharui dan dikitar semula. Minyak fosil digunakan untuk kegunaan masakan dan pembakaran. Di samping itu, minyak dan arang, adalah sesuatu yang sedikit bagi sesuatu permintaan kegunaan. Kesan daripada tenaga yang tidak boleh diperbaharui boleh menyebabkan struktur bentuk muka bumi berkurang serta menghapuskan habitat dan pelupusan hutan yang tidak dijaga. Tenaga bantuan membentuk sesuatu tenaga elektrik yang banyak untuk utility dan boleh dikitar semula. Objektif utama projek ini adalah bertujuan mengurangkan tahap kemalangan, impak, sakit yang serius dan mengurangkan kadar kes kematian yang berlaku di gunung dan kawasan cerun bukit. Selain daripada itu juga, projek ini bertujuan menganalisis voltan terhadap impak kemalangan (putaran penhadang jalan menggunakan hub dynamo) menggunakan konsep seperti penukaran tenaga. Di samping itu juga, dapat membentuk dan mengimplikasikan konsep dan sistem tersebut. Melihat daripada sudut projek, limit projek dan had kegunaan sistem ini hanya diimplikasikan di kawasan kawasan seperti jalan di gunung dan cerun bukit sahaja.

ABSTRACT

Renewable energy is the energy that is collected from the renewable energy such sunlight, wind, rain, tides, and waves. Beside that, the renewable energy also often provide and produce four important energy areas; electricity generation, air, water and energy services. Other than that, recovery energy is one of renewable energy and commonly used to produce of electric power for daily use. As we know, the natural gas such fossil fuel is the non renewable energy and cannot be recycled. the fossil fuel used as source energy for cooking, and heating. For coal and oil, it is a bit costly for energy consumption usage. The effect of non renewable energy can occurs deep beneath the earth's surface and consuming them might damage the forest resources and animal habitat. The recovery energy provides large an electrical power for utility and can excess energy for recycle. The main objective of this project are to reduce the accident, impact, critical injuries and decrease died human cases. Beside that, the objective already to analyses the voltage of impact accident (rotating barrier with transmutation concept) and to design, implement the system. From the project, the limitation of the project are also only at the downhill and mountain road. As we know, the accident cases in the Malaysian also increase year by years. So, the project will help to decrease the accident cases. The system also use the dynamo hub for produce the electrical energy from the kinetic energy. The system must be able by the weight of the rolling barrier, high and strength of the solid metal and thickness of the of ability of the hard rubber and metal plate. from the result, the performance of the recovery energy is depends on the speed and the rotation of dynamo. Lastly, this system already can contributed a lot of electrical energy, stored and will be backup source during the breakdown occurs.

DEDICATION

To my beloved parents and family,Ahmad Dugel Bin Bunangin,Norfazlen binti Ahmad Dugel,Norzakiah Binti Ahmad Dugel,Muhamad salleh bin Ahmad Dugel,Muhd Shahrul Afiq bin Ahmad Dugel.

To my beloved mother Norani binti Mad Jizan,this is present for you and i hope you will happy with this.i miss and love you so much.

To my future wife ,as soon i graduated,i will marry you.

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LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

Al	-	Aluminum
EVA	-	Evolution vehicles automation
ASEAN	-	Association of Southeast Asian Nations
V	-	Voltage
ETI	-	Evolution in traffic innovation
AIEE	-	American institute of electrical engineers
AC	-	Alternating current
DC	-	Direct current

CHAPTER 1

INTRODUCTION

1.0 Background

The safety divider downhill road are consist safety rolling barrier that will attach at the divider crossing the mountain road. The rolling barrier will attach to avoid the fatal damage by rotating car or any vehicles especially like trailer, bus, and truck hits the barrier. In the addition, the implementation of safety divider downhill road are using the transmutation concept. From the transmutation concept, the kinetic energy will transform to the electrical energy when the system will operates. Besides that, the safety divider downhill road made of the special chemical compound like hard rubber to protect from critical damage. The transmutation concept will produce the electrical energy and store to the battery. Further more ,the project will be prevent the drivers and passengers from fatal accident by not only absorbing shock energy but also converting shock energy into rotational energy. Other than that, the impact and serious injuries of human will be reduce and decrease if the project will be installs and creates at the every road at the mountain or hill.

The operation rolling guard rail barrier are rotating barrel converts great shock from vehicle collision to rotational energy to absorb shock. the rolling of barrier will reduce the speed of car when hitting the rolling barrier for the safety. Upper and lower frames adjust tires of large and small vehicles to prevent the steering system function loss. The equipment will protect the car from loss control and serious damages. So, the critical injuries will be prevented when the accident will happen. The 3 dimensional structure of the D shaped frame and buffering bracket distribute and absorb the second shock. For the hardware part, Props at an interval of 0.7 meter increase bearing power to prevent accident transportation from going over the guardrail and turning over into a hazardous area. The product has a rotating barrier divider made of EVA with good shock absorption power, 3 dimensional buffering frames and dense props will be support the frames. The safety divider downhill road focus on the mountain road only. This project are to prevent the serious accident and reduce the higher of death rates.

1.1 Problem statement

Nowadays, the seriously accident and the higher number of died human every years are increase at the mountain road . The objective of the project are to protect the human from the seriously injuries and critical damage during impact of accident happen. Beside that, the accident at the mountain already have the big cases and problem because when the accident occur, all of the passenger or human will have critical impact and died. Mostly when the accident will happen, the overall vehicles like car, bus, truck, trailer will be lost control and fall into the ravine. Lastly, due to decrease the non renewable energy such as fuel, gas and charcoal.

1.2 Objective

1. To reduce the accident, impact, critical injuries and decrease died human cases.
2. To analyses the voltage of impact accident (rotating barrier with transmutation concept).
3. To design and implement the system.

1.3 Scope

The project are cover about how to reduce the accident and critical damage during the accident. In the addition, the safety divider mountain road are build and implement to produce the electrical energy. From the project, transmutation system concept are refer to conversion the kinetic energy to the electrical energy produce by rotating the barrier to electrical energy. The project must be install at the mountain and the hill side. The limitation project are covered at the mountain and hill road only. Beside that, the project not using at the highway or another places. The target for operating this project is at highest possibilities of transportation vehicle accident occur. Which is at the downhill or corner near the ravine.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

Nowadays, Malaysia is the best popular country to the passenger come and know about the populations and lifestyles of Malaysian people. Cameron highland and Genting highland is the most popular places in the Malaysian. So, more people come from another country move the Cameron highland and Genting highland for traveling. The popular places like Cameron highland and Genting highland have the road that are long and very dangerous. It will cause the accident because the road mostly in not good condition and mostly the divider are not in the maintenance carefully. The seriously accident and the higher number quantity of died human every years are increase at the mountain.

The implementation of safety divider downhill road with the transmutation concept are to reduce the impact during the car crashes on motorways, according to the manufacturer. From the project, the each barrier will use the good quality of product like the steel tube with plastic that spin during the impact happen. The quality of the product also use the dynamo. Furthermore, function of the dynamo are to convert the kinetic energy to the electrical energy during the rolling barrier are functional. Beside that, the accident at the mountain already have the big cases and problem because when the accident occur, all of the passenger or human will have critical impact and died. Mostly when the accident will happen, the overall vehicles like car, bus, truck, trailer will be lost control and fall into the ravine. So, the product need to be

installed at the divider mountain road where vehicle are mostly exposed to frequent accident.

2.1 The implementation of safety divider downhill road with the transmutation concept

In Korean, the company that specialists in guardrail system and traffic cones has developed and build a new barrier system that combination rollers to absorb impact and steer vehicle back into the the normal condition. The system also already to reduce the critical damages and the died cases. For the function, the concrete barrier and conventional metal guardrail system are most effective and safety, but cause major damage to the impacting vehicle and the guardrail itself.

E ti (evolution in traffic innovation)believe their softer guardrail system will protect drivers from the impact shock and save life. The implementation of transmutation concept are already to save the human life,reduce the died cases and can produce the electrical energy by converting the kinetic energy from rotating barrier when the accident occur on the spot at the safety divider mountain road. The safety divider road is designed to do more than absorb the more kinetic and impact energy, it will convert to the electrical energy and save it into the battery.

For the hub dynamo,when the front wheel of the bicycle, the hub frames, rotates relative to the hub axel as the bicycle travels advance to the front, the planetary drive change the permanent multi pole magnet around the coil.

When the vertical outer portions of the plate shaped pieces forming the first stack arm receive N-pole magnetic flux from the multi pole permanent magnet, then the radially the outer space portion of the plate hardware pieces forming the second stack receive S-pole magnetic flux. In the addition, when the radially outer space portion of the plate shape pieces arrange the stack receive S-pole magnetic flux coming out of the permanent magnet, then the radially outer portion of the plate-shaped pieces forming the second bank receive N-pole magnetic flux. The generating

of the power transfer by the wire to the connector and connector connect the all electrical devices of the bicycle.(Vivek Kumar¹, Dr. Prakash Verma²,September 2015).

A dynamo is a original another name for an electrical generator, generally means a generator that out turn direct current with the use of a commutator for functional. In the addition,dynamos were the first electrical generators adapted of delivering power for the any industry,citizen and consumer and the authority upon which many other later electric-power permutation devices were based, including the part of equipment like the electric motor, the alternating-current alternator, and the rotary converter,and another part of the motor. The commutator reverses the connection of the winding's to the external circuit when the potential reverses, so instead of alternating current, a pulsing direct current is produced.(T. Allen Prasad¹, Lokesh Ramesh²,Sep-Oct. 2012)

In the addition,the basic advantages of the hub motor is already conversion with that. There is no need to mounting from the external brackets and drive chain. It is to support a transmission and motor. Instead of all of this contain inside the wheel of the hardware which mount on the bike like any other of wheel.(Mr. Abhijeet Khandagale^{#1}, Mr. Shrikant Sangludkar^{#2}, 2011).

Furthermore,from the mechanical part of the hub motor,the electromagnetic field are already supplied to the stationary of the winding motor. Plus,the outer part of the motor will rotates,or tries to follow those field turning the wheel to which attach it. Beside that,the energy of the wheel transfer to brushed motor through the physical contact of brushes to rotates the shaft of the motor. (Mr. Abhijeet Khandagale^{#1}, Mr. Shrikant Sangludkar^{#2}, 2011).

A chaotic already called dynamical system ,if it has 3 type and properties like infinite recurrence boundlessness,sensitive dependence on initial condition. In the addition,theory of chaos will be investigate the qualitative and numerical study in deterministic non linear dynamical system study of unstable a periodic behavior . In the control theoretical the active control method is used when the parameter of measurement are available. A pair master and the and the slave system are already considered for the synchronization process.

Beside that,the design goal of anti -synchronization is to give the feedback to the mechanism. So that,equal in magnitude and opposite in sign asymptotically are trajectories of master and slave system.(Sundarapandian Vaidyanathan ,R & D Centre, Vel Tech University, Avadi, Chennai, Tamil Nadu, India, Vol.8, No.9 pp 393-405, 2015).



Figure 2.1 safety divider road

The rollers barrier and the liquid props absorb shock from accident vehicles and frames with the smooth surface adjust tires of the vehicles and guide them in the moving direction to the protect second rear end collision. The 3 type of dimensional structure of the d shaped and buffering bracket distribute and absorb the second shock. Props at an interval of 0.7 meter increases bearing power to prevent vehicles from further derailing and get more damages. As the props are independent ,only damaged part need to replaced. this keep maintenance cost pretty low. So, the maintenance already can be check from month to every month. The manufacturers are consist different rolling barriers for roadsides,median strips,tunnels along with the open guardrails for landscapes. .(M. Perneti, Department of Civil Engineering Second University of Naples).