LEMBAR HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW* KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel) Nama/ Jumlah Penulis Status Pengugul	:	Modeling of heating value stepwise multiple linear regr 4 Orang Penulis pertama/ Penulis Ko	of ressi	municipal solid waste based on ultimate analysis using on in Semarang
Identitas Jurnal Ilmiah	:	 a. Nama Jurnal b. Nomor ISSN c. Vol, No., Bln Thn d. Penerbit e. DOI artikel (jika ada) f. Alamat web jurnal 	105µ : : : :	ARPN Journal of Engineering and Applied Sciences 1819-6608 VOL. 12, NO. 9, MAY 2017 Asian Research Publishing Network http://www.arpnjournals.com/jeas/volume_09_2017.htm
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d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	11,6	11,5	11,55		
Total = (100%)	39,1	39	39,05		

Semarang, 10 Mei 2023 Reviewer 1

Prof. Dr. Kusworo Adi, S.Si., M.T. NIP. 197203171998021001 Unit Kerja : Fakultas Sains dan Matematika Bidang Ilmu: Fisika

Reviewer 2

Prof. Dr. Heri Sutanto, S.Si., M.Si. NIP. 197502151998021001 Unit Kerja : Fakultas Sains dan Matematika Bidang Ilmu: Fisika

LEMBAR HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel)	:	Modeling of heating value stepwise multiple linear regr	of municipal solid waste based on ultimate analysis using ression in Semarang
Nama/ Jumlah Penulis Status Pengusul Identitas Jurnal Ilmiah	:	 4 Orang Penulis pertama/ Penulis Kora. Nama Jurnal Nomor ISSN Vol, No., Bln Thn d. Penerbit e. DOI artikel (jika ada) f. Alamat web jurnal 	 respondesi ** ARPN Journal of Engineering and Applied Sciences 1819-6608 VOL. 12, NO. 9, MAY 2017 Asian Research Publishing Network http://www.arpnjournals.com/jeas/volume_09_2017.htm
		Alamat Artikel g. Terindex	 https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd =&ved=2ahUKEwiY1YKK69f- AhWvi2MGHYA4B5cQFnoECAkQAQ&url=http%3A%2F%2Fwww. arpnjournals.org%2Fjeas%2Fresearch_papers%2Frp_2017%2Fjeas_05 17_5984.pdf&usg=AOvVaw0ybUOEiz2abamSflFL8111 <u>Scopus (</u>Q3 (2017), SJR:0,189)
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b. Ruang lingkup dan kedalaman pembahasan (30%)	12			11,7
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	12			11,8
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			11,6
Total = (100%)	40			39,1
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a. Kelengkapan unsur isi jurnal (10%)	4			4
b. Ruang lingkup dan kedalaman pembahasan (30%)	12			11,7
 Kecukupan dan kemutahiran data/informasi dan metodologi (30%) 	12			11,8
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			11,5
Total = (100%)	40			39
Nilai Pengusul = 60%x23,4				

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<u>Ruang lingkup dan kedalaman pembahasan:</u> Pembahasan dengan menggunakan metoda yang diusulkan dalam artikel cukup komprehensip. Diskusi telah dilakukan dengan para peneliti lain melalui referensi yang disitasi. Sebuah artikel yang menarik. Kecukupan dan kemutakhiran data/informasi dan metodologi:

3. <u>Kecukupan dan kemutakhiran data/informasi dan metodologi:</u> Data dan referensi mutakhir, termasuk referensi dari kajian yang dilakukan oleh peneliti. Data disajikan dengan baik. Metoda standar dibidangnya dan akan bisa direfleksi oleh peneliti lain sebidang.

4. <u>Kelengkapan unsur dan kualitas terbitan:</u> Penerbitan sudah sangat bagus tertata rapi, **ARPN Journal of Engineering and Applied Sciences** dengan penerbit Asian Research Publishing Network. Tahun 2010 jurnal ini pernah discontinue Scopus. *Nilai maksimum 40*

Semarang, 5 Mei 2023 Reviewer 2 Prof/Dr. Heri Sutanto, S.Si., M.Si.

NIP. 197502151998021001 Unit Kerja : Fakultas Sains dan Matematika Bidang Ilmu: Fisika Scopus



Abstract

This study is aimed at developing an empirical model to estimate the heating value of municipal solid waste as a function of its element content (C, H, N, S, O). A correlation was developed using multiple stepwise regression analysis based on 29 samples of municipal solid waste that were randomly selected and gathered from 29 different areas in Semarang. Experimental results show that carbon and hydrogen are statistically significant predictors of the heating value. The model is HHV= -2762.68+114.63C+310.55H kcal/kg (R^2 = 0.99 and Adj R^2 =0.98). Furthermore, this work also indicates that if only the C content is known, the heating value can be estimated by HHV= -1737.55+143.33C kcal/kg (R^2 = 0.94 and Adj R^2 =0.94). These results show that the new correlations using regression method give accurate and excellent results that are closer to measured values. © 2006-2017 Asian Research Publishing Network (ARPN).

Author keywords

Heating value; MSW; Stepwise multiple regression; Ultimate analysis

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Title: Modeling of heating value of municipal solid waste based on ultimate analysis using multiple stepwise regression linear in Semarang Author (s): Ainie Khuriati, Wahyu Setia Budi, Muhammad Nur, Istadi Istadi and Gatot Suwoto This study is aimed at developing an empirical model to estimate the heating value of municipal solid waste as a function of its Abstract: This study is anned at developing an empirical moder to estimate the facing value of multiple study is available at a distribution in the element context (C, H, N, S, O). A correlation was developed using multiple stepwise regression analysis based on 29 stamples of municipal solid waste that were randomly selected and gathered from 29 different areas in Semarang. Experimental results show that carbon and hydrogen are statistically significant predictors of the heating value. The model is HHV= -2762.68+114.63C+310.55H kcal/kg (R2= 0.99 and Adj R2 = 0.99). Furthermore, this work also indicates that if only the C content is known, the heating value can be estimated by HHV= -1737.55+143.33C kcal/kg (R2= 0.94 and Adj R2 = 0.94). These results show that the new correlations using regression method give accurate and excellent results that are closer to measured values. Full Text Title: Shrouded kinetic turbines optimization for run the river and tidal pico-hydropower Author (s): Robert Vincent Clarke At our current state of technological development, the designs being proposed for the "channeling of a turbine" based on wind power, Abstract: commonly called DAWT (Diffuser-Augmented) or CWAT (Compact-Acceleration), utilize a diffuser (divergent) shaped as an airfoli. Further developments of the concept have brought about the introduction of other winged-profiled ring structures behind or in front Further developments of the concept have brought about the introduction of other winged-profiled ring structures behind or in front of the entrance to the divergent making the design more complicated as well as more expensive due to the difficulty of producing correct contours. Even though this results in an increase in power, it usually is limited to slightly more than a four-fold increase at most. In addition, brims (wing-lens) have been recently added around the external edges of the diffuser. Nonetheless, brims thus designed, are not suitable for use in a river due to the significant stress that the structure as a whole needs to withstand. No design, proposed until now, includes a convergent at the entrance to a turbine due to the obstruction effect that it has on the flow of water into the turbine, slowing it down and thereby reducing the acceleration produced by the "channelizing" divergent. This article will introduce an innovative convergent-divergent to which can be inserted a hydro-kinetic turbine which will increase the maximum output power available 12.7 times compared with a free turbine. Full Text Title: Modeling initial velocity profiles for continuous free-vibrating beams using distributed impulse loading Author (s): Mustafa Kamal Al-Kamal and David J. Mukai Abstract: The purpose of this paper is to develop an analysis method to solve the free vibration response for a continuous system subjected to The purpose of this paper is to develop an analysis method to solve the free vibration response for a continuous system subjected to an initial velocity profile using an initial velocity approximation based on an equivalent impulse load. It has been shown that for a single degree of freedom system, the initial velocity can be applied as an impulsive loading with a very short duration. The proposed analysis method in this paper is done for a continuous system to show that this approximation works not only for a single degree of freedom system, but for a continuous system as well. The assumed initial velocity profile is from a case of interest to the authors. The available analytical solution for a continuous system such as a simply supported beam subjected to an initial velocity is compared with the finite element solution determined from SAP 2000 using the initial velocity approximation. The SAP 2000 solution using the proposed approximation showed an excellent agreement to the analytical solution. Finally, this method can be used to find the dynamic response of complex frames subjected to an initial velocity profile, where the analytical solution for such cases is difficult to find. find.

Utilization of rice husk ash and ceramic wastes in manufacturing of developed cement bricks

Author (s): Azza I. Hafez, Maaly M. A. Khedr, Mona S. Mohammed, Randa M. Osman and Rania M. Sabry

Abstract: Huge quantity of rice husk ash (RHA) and broken ceramics in Egypt are produced as wastes and become of great threat to the environment, causing damage to the land and the surrounding areas in which it is dumped. In addition, production of cement is responsible for about 7% of all CO2 generated in the world. For that, the aim of the present research is to produce modified cement bricks by replacing cement partially by RHA and broken ceramic wastes, to bring a substantial reduction for CO2 emitted every year in the atmosphere, and to reuse agricultural and industrial solid wastes. Therefore two sets of experiments were investigated by replacing part of Ordinary Portland Cement (OPC) with: 1) RHA and 2) mixture of RHA and ceramic wastes, to produce modified cement bricks, at different curing time, namely7, 14 and 28 days. Characterizations of raw materials used for the target preparation were carried out covering: free silica and organic matters, XRD, TGA, and DTA. Thecoid and boiling water absorption, compressive strength, apparent porosity and bulk density for the prepared modified concrete samples are determined. The experimental results proved that the , modified cement brick contains 5% RHA and 3% ceramic powder as cement replacement shows higher bulk density and compressive strength were 2.33gm/cm3anc 295 kg/cm2respectively, which are higher than the allowable standard limits. In addition, preliminary production cost was estimated.

Full Text

Title: Minimizing passenger congestion in train stations through Radio Frequency Identification (RFID) coupled with database monitoring system

Author (s): Aaron Don M. Africa, Sydney Jane P. Bautista, Francis Joseph O. Lardizabal, John Nelvic C. Patron and Angelico Gabriel N. Santos

Abstract: This study is about the implementation of an automated transportation system through Radio Frequency Identification and Database Management which can be used for the Philippine's Manila Rail Transit (MRT) system. The group would focus on two major tasks and that is for the interface of the RFID reader to the PC and creating simulation that has a database that would store, sort and retrieve data according to the needs of the system. The input module for the simulation system is done in two methods first is coming from the user input and the other one is with the use of RFID tags to be read and checked by the reader before sending it to the database system for recording and classification of data. The system has also been made in accordance to the current situation of the MRT With the use different formulas and equations created by the group, would then determine the train's scheduling depending on the number of RFID tags per station. This would also determine the number of passengers that would enter the train station, and could possibly reduce people congestion inside the train. This paper has been able to produce an algorithm to aid in the queuing of the MRT System to ease congestion.

Full Text

Title: U

SHROUDED KINETIC TURBINES OPTIMIZATION FOR RUN THE RIVER AND TIDAL PICO-HYDROPOWER

Robert Vincent Clarke

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ABSTRACT

At our current state of technological development, the designs being proposed for the "channeling of a turbine" based on wind power, commonly called DAWT (Diffuser-Augmented) or CWAT (Compact-Acceleration), utilize a diffuser (divergent) shaped as an airfoil. Further developments of the concept have brought about the introduction of other winged-profiled ring structures behind or in front of the entrance to the divergent making the design more complicated as well as more expensive due to the difficulty of producing correct contours. Even though this results in an increase in power, it usually is limited to slightly more than a four-fold increase at most. In addition, brims (wing-lens) have been recently added around the external edges of the diffuser. Nonetheless, brims thus designed, are not suitable for use in a river due to the significant stress that the structure as a whole needs to withstand. No design, proposed until now, includes a convergent at the entrance to a turbine due to the obstruction effect that it has on the flow of water into the turbine, slowing it down and thereby reducing the acceleration produced by the "channelizing" divergent. This article will introduce an innovative convergent-divergent to which can be inserted a hydro-kinetic turbine which will increase the maximum output power available 12.7 times compared with a free turbine.

Keywords: diffuser-augmented, compact-acceleration, hydro-power, run the river, low head, water powered turbine.

INTRODUCTION

Hydro-electric power was the first source of renewable energy to be used on a large scale and at the moment represents about 20% of world energy production. Hydro-electric power represents the principal alternative source of energy to fossil fuels used in Italy and produces 15% of the national needs. According to GSE sources [5], 18,232 MW are produced from 303 stations larger than 10 MW, 781 between 1 and 10 MW, and 1886 stations under 1 MW. In Figure-1 is shown the distribution, by region, of class power percentage, installed in Italy in 2012.



Figure-1. Distribution by region of hydro-electric power in Italy (2012) ^[5].

In any event, hydro-electric power, compared with other forms of renewable energy, has reached its

maximum level of exploitation of the resources available. Most large-scale power stations have already been completed. The only road left is to develop so-called "small hydro stations". In fact, an enormous potential for hydro-electric energy exists in the numerous rivers, waterways and artificial irrigation canals in Italy (an around the World) where it is not practical to build a damn. In this situation, a conventional turbine, whether it be a Pelton, a Francis or a Kaplan type, would need a piezometric head of at least few meters to make it function and thus would be inefficient in these types of waterways. It is for this reason, together with an ever increasing desire to safe-guard the environment that a lot of attention in the last few decades has been drawn to free flow turbines. These turbines convert the kinetic energy of a moving mass of fluid directly into mechanical energy made available to a shaft, without interrupting the natural flow, much like a wind turbine. This direct conversion has a number of advantages, above all, the elimination of the need for large public works projects to block the flow of water which has significant environmental impact and high investment costs. In addition, free flow turbines allow for a greater range of choice of potential sites. These turbines, also called hydro-kinetic turbines, work due to concepts derived from aerogenerators and until now have been based on designs of wind rotors. As of today, numerous and varied designs have been proposed. These designs range from the very simple concept of waterwheels which work by force of resistance to rotors (placed either horizontally or vertically with respect to a fluid flow) that use a with an airfoil-shape blade to exploit the lift force so that it rotates with a speed greater than the flow which strikes them. These turbines have a verified power coefficient (C_p) ranging from 0.2 for resistancebased turbines to a maximum of 0.4 for lift-based turbines. Shrouded turbines are not subject to the so-called

MODELING OF HEATING VALUE OF MUNICIPAL SOLID WASTE BASED ON ULTIMATE ANALYSIS USING MULTIPLE STEPWISE REGRESION LINEAR IN SEMARANG

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ABSTRACT

This study is aimed at developing an empirical model to estimate the heating value of municipal solid waste as a function of its element content (C, H, N, S, O). A correlation was developed using multiple stepwise regression analysis based on 29 samples of municipal solid waste that were randomly selected and gathered from 29 different areas in Semarang. Experimental results show that carbon and hydrogen are statistically significant predictors of the heating value. The model is HHV= -2762.68+114.63C+310.55H kcal/kg (R^2 = 0.99 and Adj R^2 =0.98). Furthermore, this work also indicates that if only the C content is known, the heating value can be estimated by HHV= -1737.55+143.33C kcal/kg (R^2 = 0.94 and Adj R^2 =0.94). These results show that the new correlations using regression method give accurate and excellent results that are closer to measured values.

Keywords: heating value, MSW, stepwise multiple regression, ultimate analysis.

INTRODUCTION

Municipal solid waste (MSW) has been a major environmental issue in urban areas. Population growth, urbanization, economic development, and rising living standard have apparently contributed to by-product to the environment in the form of a burgeoning amount of MSW (Akdag et al., 2016). MSW becomes a serious problem when it comes to its disposal as the volume may exceed environmental capacity. One of the solutions commonly adopted to minimize waste volume is burning and converting it into energy in the form of heat or steam or electricity (EIA, 2007). Thermal conversion processes available for the thermal treatment of solid wastes are combustion, gasification, and pyrolysis. The most important parameters affecting thermal processing were its composition and higher heating value (HHV) (Zhou et al., 2014). HHV is a measure of the chemical energy bound in a feedstock; this energy is released during combustion (Erol et al., 2010). There are three methods to determine the HHV of MSW, i.e. full-scale boiler as a calorimeter, laboratory bomb calorimeter, and calculation via empirical models (Ogwueleka, 2010). Researchers have developed many empirical models. Previous studies documented three empirical models to estimate the heating value of waste based on its physical components (Liu et al., 1996, Lin et al., 2013, Lin et al., 2015, Khuriati et al., 2016), ultimate components (Tchobanoglous et al., 1993, Liu et al., 1996, Kathiravale et al., 2003, Meraz et al., 2003, Akkaya et al., 2009, Komilis et al., 2012, Shi et al., 2016), and proximate components (Kathiravale et al., 2003,

Chang *et al.*, 2007). To the current day, the most popular method used to predict HHV/LHV has been linear regression. Developing an empirical model to predict the heat value is considered easier and more economical by using regression analysis Lin *et al.*, 2007). A good prediction of the heating value of waste to be burnt is important during the arrangement of the burner and afterburner chambers (Lin *et al.*, 2007). Table-1 contains the modelling to predict the MSW energy content using multiple regression based on ultimate analyse.

MSW is a complex material, differ from one place to another, from one country to another (Lin *et al.*, 2015). Waste composition greatly depends on social-economic status, lifestyle, and climate of a particular country (Lin *et al.*, 2015, Kathiravale, 2003). MSW can be categorized as combustible and noncombustible material combination (Zhou *et al.*, 2014, Meraz et al., 2003). Traditionally, combustible waste fraction can be divided into six groups, i.e. food residuals, wood, paper, textile, plastic, and rubber wastes (Zhou *et al.*, 2013).

Lack of information about MSW in the landfill in Indonesia relates to high cost of sampling and chemical analysis. This study has the following objectives: a) to determine the elemental content of MSW in Semarang, (b) to measure the heating values of MSW as a dependent variable to develop a new correlation as a function of element content, c) to develop an empirical correlation to estimate the heating value of municipal solid waste as a function of its elemental content (C, H, N, S, O) using multiple stepwise linear regression.



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MODELING INITIAL VELOCITY PROFILES FOR CONTINUOUS FREE-VIBRATING BEAMS USING DISTRIBUTED IMPULSE LOADING

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ABSTRACT

The purpose of this paper is to develop an analysis method to solve the free vibration response for a continuous system subjected to an initial velocity profile using an initial velocity approximation based on an equivalent impulse load. It has been shown that for a single degree of freedom system, the initial velocity can be applied as an impulsive loading with a very short duration. The proposed analysis method in this paper is done for a continuous system to show that this approximation works not only for a single degree of freedom system, but for a continuous system as well. The assumed initial velocity profile is from a case of interest to the authors. The available analytical solution for a continuous system such as a simply supported beam subjected to an initial velocity is compared with the finite element solution determined from SAP 2000 using the initial velocity approximation. The SAP2000 solution using the proposed approximation showed an excellent agreement to the analytical solution. Finally, this method can be used to find the dynamic response of complex frames subjected to an initial velocity profile, where the analytical solution for such cases is difficult to find.

Keywords: free vibration, initial velocity, SAP2000, FEM.

1. INTRODUCTION

In general, the analytical solution of a structural frame subjected to an initial velocityprofiledoesnotexist. This problem is a bit so the ricand thus is not covered in traditional structural dynamics texts [1,2,3,4]. For that purpose, this paper provides a solution for a structural frame subjected to an initial velocity profile using a distributed impulse load in SAP2000.

SAP2000 is a finite element program commonly used by structural engineers [8]. Unfortunately, there is no direct way to find the dynamic response for a structure subjected to an initial velocity profile within this program. Therefore, the initial velocity profile has to be converted to an impulse load.

According to the authors in Reference [5], for a single degree of freedom system, animpulsive loading could be applied as an initial velocity. When this is done an accurate result has been achieved for a very small ratio of the load duration time to the natural period of the system. In this work, we will convert the initial velocity profile of a continuous system such as a simply supported beam into a distributed impulse load using SAP2000 and verify the results with the available analytical solution.

The analytical solution for a continuous system such as a simply supported beam subjected to an initial velocity profile is available in References [1, 2, 3, 4]. Once the results have been confirmed against the available analytical solution, the proposed method will be used to find the response of a structural frame subjected to an initial velocity profile.

2. METHODS

2.1 Initial velocity approximation

Consider a single degree of freedom system subjected to a forcing function F(t) with a mass of *m* and a linear spring with stiffness *k* where damping is ignored as shown in Figure-1.The well-known equation of motion for the system shown in Figure-1 is given by [1,2,3,4]:

$$m\ddot{u} + ku = F(t) \tag{1}$$



Figure-1. Single degree of freedom system.

It has been shown by the authors in Reference [5] that an impulsive loading could be applied as an initial velocity. Equation (1) is rearranged as:

$$\ddot{u} = \frac{F(t)}{m} - \frac{ku}{m} \tag{2}$$

MINIMIZING PASSENGER CONGESTION IN TRAIN STATIONS THROUGH RADIO FREQUENCY IDENTIFICATION (RFID) COUPLED WITH DATABASE MONITORING SYSTEM

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ABSTRACT

This study is about the implementation of an automated transportation system through Radio Frequency Identification and Database Management which can be used for the Philippine's Manila Rail Transit (MRT) system. The group would focus on two major tasks and that is for the interface of the RFID reader to the PC and creating simulation that has a database that would store, sort and retrieve data according to the needs of the system. The input module for the simulation system is done in two methods first is coming from the user input and the other one is with the use of RFID tags to be read and checked by the reader before sending it to the database system for recording and classification of data. The system has also been made in accordance to the current situation of the MRT. With the use different formulas and equations created by the group, would then determine the train's scheduling depending on the number of RFID tags per station. This would also determine the number of passengers that would enter the train station, and could possibly reduce people congestion inside the train. This paper has been able to produce an algorithm to aid in the queuing of the MRT System to ease congestion.

Keywords: train optimization algorithm, database management, RFID, transportation management.

1. INTRODUCTION

Rapid transits are considered to be one of the most efficient and fastest modes of transportation today [1]. It is a high capacity public transport that provides safe, fast and reliable transport services for the people. Unlike cars, buses and other means of transportation, rapid transits operate on grade separated tunnels in order to operate at a faster pace [2]. The world's first rapid transit system opened in 1863, the Metropolitan Railway (also known as MET) located in London, England. Since then, its development has vastly improved and has been adopted in different areas of the world [3].

The Manila Metro Rail Transit System Line 3 of the Philippines, popularly known as MRT, much like MET is a rapid transit system that operates in Metro Manila. Opened in 1999, MRT is the country's third rapid transit line; MRT 3 is operated by the Metro Rail Transit Corporation (MRTC), a private company in partnership with the Department of Transportation and Communications (DOTC) under a Build-Operate-Transfer (BOT) agreement. MRT 3 is composed of 13 stations along over 16.9 Kilometers of line, from North avenue station (Quezon City) and ends at Taft avenue station (Pasay City) [4].

MRT is the main of solution of DOTC on trying to resolve and lessen the chronic traffic congestion among Epifanio de los Santos Avenue (EDSA). It was designed to carry around 23,000 passengers per hour, per direction, and is expandable to accommodate 48,000 passengers per hour, per direction. It operates around 17.5 hours a day that runs from 5:30 AM up to 11 PM. However, due to the continuing increase of commuters around Metro Manila, the trains are forced to accommodate more people than their usual limit causing more wear and tear to the trains and its track [5]. They are forced to do manual scheduling for the flow of trains, these type of scheduling however is not as efficient as automated scheduling system because they could not respond to immediate changes in number of people, these manual scheduling of trains results in longer queues for the people. With the development of computers and technologies, it would be more efficient to implement an automated train scheduling algorithm in order to calculate and monitor the best possible way for train operations [6].

1.1 Statement of the Problem

The Metro Rail Transit (MRT) is a common means of transportation for the public, going to school, going to work, or going to their respective businesses. Because of the increasing population, there is a corresponding increase in the demand of the usage of the MRT. Some of the accidents and machine breakdowns brings inefficiency to the system. The Metro Rail Transit, no longer serves its purpose as effective as before. According to philstar.com, the current system of the queues for the MRT only limits 500 persons to queue for the actual ride. This has left the masses a challenge to ride in order to go to their respective businesses and also bringing congestion to the MRT stations.

1.2 General objective

 To develop a train control system through database management that will provide an effective monitoring entry of passengers per station and scheduling process.

