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

Judul Jurnal Ilmiah (Artikel)	:	Oppurtunities Efficiency Study of Electric Energy Consumption in PT SAI Apparel Semarang		
Jumlah Penulis	:	4 orang (**Jaka Windarta**, Agung Nugroho, Ahmad Taufiq Yunanto)		
Status Pengusul	:	penulis ke-1		
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Mochammad Facta, S.T., M.T., Ph.D.
NIP. 197106161999031003
Unit : Teknik Elektro FT UNDIP

Reviewer 1

Dr. Wahyudi, ST, MT
NIP. 196906121994031001
Unit : Teknik Elektro FT UNDIP

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NIP. 196906121994031001
Unit : Teknik Elektro FT UNDIP

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Mochammad Facta, S.T., M.T., Ph.D.
NIP. 197106161999031003
Unit : Teknik Elektro FT UNDIP

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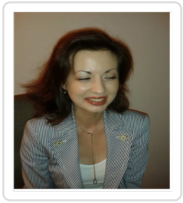

Tatjana Gric (30), Ph.D

Department of Electrical and Computer Engineering
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1459 Oxford Street, Halifax, NS B3H 4R2
Canada

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School of Engineering and Digital Arts
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Anna University
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University of Kordofan
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Israel

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Department of Electrical Engineering
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Tamilnadu, India

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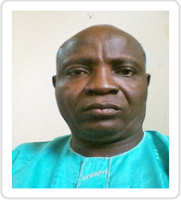

Nwohu Mark Ndubuka

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Department of Electrical and Electronics Engineering
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Oppurtunities Efficiency Study of Electric Energy Consumption in PT. SAI Apparel Semarang

Jaka Windarta[1*], Agung Nugroho[2], Denis[2], Ahmad Taufik Yunanto[2]

[1]*Master Program of Energy Dept, Diponegoro University, Semarang, Indonesia*

[2]*Electrical Eng. Dept, Diponegoro University, Semarang, Indonesia*

Corresponding Author:** ***Jaka Windarta, *Master Program of Energy Dept, Diponegoro University, Semarang, Indonesia*

Abstract: *National energy stability has a very important role in support of the national development sustainable. However, the problem is often the rate of energy availability not balanced with the rate of energy needs, therefore it is necessary to do the efficiency of energy consumption on the user side. The industrial sector becomes the largest energy consumer in Indonesia. In this study author will conduct analysis energy efficiency potential by raising a case of study on one of the garment industry in semarang, namely PT. SAI Apparel. The energy efficiency will be based on production and energy consumption data during 2016, and evaluate the measurement of the electrical power quality. Based on the results of data analysis obtained from PT. SAI Apparel, it is known that electric power quality values for current imbalance parameters, voltage imbalance, and power factor have values that are not in accordance with the standard and risk increase the loss of power. Based on the analysis of electrical power quality of PT. SAI Apparel is known some quantity of power quality of PT. SAI Apparel has values that are not in accordance with the standards and risk increase the loss of power. Seeing these conditions obtained three energy saving recommendations that can be implemented at PT. SAI Apparel, that is.RST phase load balancing to reduce voltage and current imbalance, replacement of TL lamp by using LED lamp will produce energy saving 449.687kWh/year, replacement sewing machine induction motor with servo motor will produce energy saving 616.223kWh/ year, and improvement of the power factor will produce energy savings 5.774, 5kWh/year.*

Keywords: *energy conservation; energy efficiency.*

1. INTRODUCTION

Energy stability has very important contributions in supporting sustainable national development. However, the most problem of energy use is the rate of energy availability which is not balanced with the rate of energy needs. Therefore, in order to maintain national energy stability besides to actively undertaking development and diversification on the energy supply side, energy conservation efforts on the utilization side should be done to reduce the rate of energy use.

Energy efficiency or efficient energy aims to reduce the amount of energy needed to produce a product or service. Government in Government Regulation No. 70 of 2009 has managed that users of energy sources and energy users using the energy and / or energy sources of more than 6,000 TOE (Tonne Oil Equivalent) within a year are required to conserve energy through energy management, besides energy users and / or energy sources below 6,000 TOE (Tonne Oil Equivalent) per year are required for using the energy economically and efficiently.

On this research study, the authors take case studies on one of garment industry at Semarang city, namely PT. SAI Apparel. Total energy consumption at PT.SAI Apparel during 2016 reached 4,815 TOE (Tonne of Oil Equivalent). Because the energy consumption during 2016 is less than 6,000 TOE (Ton of Oil Equivalent), PT. SAI Apparel has no obligation to conserve energy through energy management, but PT. SAI Apparel still has an obligation to consume energy economically and efficiently. Also From the data sampling of Automatic Meter Reading owned by PT. SAI Apparel, during the month of July recorded every day there is a power factor value below 0.85. Also form the data bill of electricity costs PT. PLN (Persero), PT. SAI Apparel was exposed to a kVARH penalty in November 2016 until January 2017[3]. There are still opportunities of energy waste that is not

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A Novel Analytical Method for Throughput Calculation of Wireless Ad-Hoc Networks Running Different Routing Algorithms

Barbaros Preveze*

Electrical and Electronics Engineering, Cankaya University, Eskişehir Yolu 29. Etimesgut, Ankara, Turkey.

Corresponding Author:** ***Barbaros Preveze, *Cankaya University Electrical and Electronics Engineering, Eskişehir Yolu 29. Km Etimesgut, Ankara, Turkey.*

Abstract: *Because of the increasing number of internet related applications, the role of total router transmission delay became much more important for the service quality. For this purpose, the tunneling techniques have been widely used especially for real time multimedia transmission to have less number of route constructions and to be able to forward each packet at each router without the need of reaching the upper OSI (Open Systems Interconnection) layers. But, in mobile networks, since the network experience with more changes in traffic conditions and node locations, tunnels will be reconstructed for many times and some extra delay will occur to reconstruct these tunnels.*

In this work, the place of the tunneling algorithm is taken by the well-known MPLS (Multi-Protocol Label Switching) protocol and for confirmation the throughput calculations are made by considering two different routing algorithms, one of which is AEABR algorithm proposed in [1] (shown in [2] that it improves the system throughput w.r.t Fastest path Routing algorithm [3] for various vehicular velocities), and the other one is Fastest Path routing algorithm [3]. In this work a novel analytical method for throughput calculation of wireless ad-hoc networks running aforementioned routing algorithms is proposed including the effects of extra delay caused by extra Route Reconstructions (RRC).

Keywords: *Throughput, Calculation, AEABR, Fastest Path, Long life Routing, Mobile, Multi-hop, MPLS.*

1. INTRODUCTION

During the transmission in multi-hop networks, most of the time is consumed by decisions regarding switching through the determined path in the core part of the network. So the best route with minimum route reconstruction delay and transmission delay between source and the destination must be predicted and established in order to satisfy the requirements of especially real-time applications such as gaming, video applications and voice applications.

For this reason, a novel routing algorithm called AEABR (Alternative Enhancement on Associativity Based Routing) has been developed [1] that provides longer route life times with fewer route reconstruction delays. In [2], AEABR algorithm was suggested to be used in IEEE 802.16j network, and it was shown that AEABR algorithm always had better results in terms of overhead, connectivity and throughput than Fastest Path [3], Ant Colony [4] and other well-known long life routing algorithms such as ABR [5] and EABR [6].

The study in [3] investigates the fastest packet transmission in wireless networks. It is shown that the end-to-end packet delay depends on the locations of the relay nodes where it has more importance in mobile networks. A novel routing algorithm is proposed to find the fastest path for minimum delay. Where, the nodes are assumed as fixed nodes in the assumed scenario of [3]. But the route life time and the effects of RRC delay are not considered here.

In [7], the throughput performances of Ant Colony, Fastest Path and Shortest Path routing algorithms are compared on an MPLS network and it was also shown for N=6 that the Fastest Path algorithm gives the best throughput results among all. However, the MPLS network simulated in this work is considered as a fixed MPLS network and the route life time and the effects of RRC delay are also not considered here.

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Current Density and Saranalysis of Biological Tissues due to Radiant Electromagnetic Waves from Base Station Antennas

Igbinovia Anthony Osaigbovo[1], Joseph Isabona[2]*

[1]*Department of Physics, College of Education, PMB 1144 Ekiadolor-Benin, Nigeria.*

[2]*Department of Physics, Federal University Lokoja, PMB 1154, Kogi State, Nigeria.*

Corresponding Author:** ***Joseph Isabona, *Department of Physics, Federal University Lokoja, PMB 1154, Kogi State, Nigeria.*

Abstract: *The environment around human contains numerous sources of nonionizing radiation, which include, but not limited to: power lines, power stations, TV and radio repeaters, cable and, RF cellular communications and satellite communications. Due to these sources, there exist a degree of interaction between the electromagnetic fields they generate and biological human tissue. For health purpose, the probe of how electromagnetic energy induces humans or how much electromagnetic energy is absorbed by the biological human tissues should be provided with answer quantitatively as much as possible. Two basic ways in which electromagnetic energy induces and impacts the biological tissue are through thermal effects and stimulant action. Whereas thermal effects occurs as a result of Joule heating, stimulant action is caused by excitation of the biological neurons and muscles owing to the induced current. Where stimulant action is measured in terms of current density J (A/m^2), a thermal effect is measured by specific absorption rate, SAR (W/kg). The work presents a simplified analytical modeling of the interaction between biological human tissues and radiant electromagnetic fields due to base station antennas. In terms of intensity of induced current density and SAR, the computed results obtained by means of the parametised analytical models are quantitatively presented and discussed.*

Keywords: *Directional antennas; Radiant electromagnetic fields; biological tissues; specific absorption rate' Induced current density.*

1. INTRODUCTION

The environment around human contains numerous sources of nonionizing radiation, which include, but not limited to: power lines, power stations, TV and radio repeaters, cable and satellite communications. Due to these sources, there exist a degree of interaction between the electromagnetic fields energy they generate and biological human tissue. Human tissues can absorb electromagnetic fields and induce conduction and displacement currents. This interaction between biological human tissues and radiated electromagnetic fields is influenced by a lot of factors in addition field frequency like dielectric properties, configured exposure source, field strength, age factor, time intensity factor, field location factor, geometry and size of the tissue, exposure environment, orientation and field polarization [1].The impact of these radiated fields can be detrimental to human tissues, especially at proximity, if the electromagnetic energy exceeds certain threshold value as recommended by some recognized international standard bodies like World Health Organization (WHO) and ICNRIP. Of late, it has been disclosed by WHO that the radiation from mobile phone potentially result to brain cancer [2-5].The International Agency of Research Cancer (IARC) has categorized electromagnetic fields into Group 2B that is carcinogenic to human. The need to also monitor the intensity electromagnetic radiations from mobile phone base station antennas has also been hinted by WHO [6].

To investigate the intensity and impacts of radiated electromagnetic energy on human tissues, the values of some essential field evaluation parameters, such as magnetic field strength, electric field strength, current density and specific absorption rates must be determined and compared with the afore mentioned internationally recognized permissible values. These field values can be assessed by means of numerical methods, analytical calculations, or by utilizing suitable measurement tools.