

## **Bisu Main Campus Electrical Energy Consumption: Basis For Improvement**

**IVY M. BAGSAC  
ROLAND GABO  
TEOFANES SARABOSING  
DAVE POJADAS  
ANACLETA PEREZ  
MAE REMEDIOS VIRTUCIO**  
*mar\_m\_a@hotmail.com*  
Bohol Island State University  
C.P.G. Avenue, Tagbilaran City

**Abstract** - The research was conducted at the Bohol Island State University Main Campus. It aims to assess the status of the electrical power system of the university as well as determine the perceptions of the electrical experts on the satisfaction rating of the school's electrical system. It was found out that the overall rating of the electrical system of BISU Main Campus is "fair". This means that there are several aspects that need improvement such as the implementation of a maintenance program and the hiring of maintenance personnel. The researchers recommend that the personnel should not be the instructors themselves but designated electrical technologists must be hired. Furthermore, there should be a periodic inspection so that defects may be detected and given remedies the earliest time possible to avoid accidents. There should also be fund allotment that should be imposed for the maintenance and personnel. Furthermore, the university must purchase more electrical supplies, tools and equipment solely for electrical maintenance. There must also be a separate maintenance shop for maintenance purpose only. An alternative electrical power source should be employed by the university such as the solar power.

Because of the very high and expensive electrical energy consumption, there is a need to use a more efficient alternative source and that is the solar power.

*Keywords* - electrical power system, electrical energy consumption

## INTRODUCTION

Electricity has become a necessity for all people. Even the farthest barrios of any municipality clamor for electrical connection. This is because with electricity, people are able to carry on their daily tasks more easily and conveniently. Transportation and communication have become faster and more efficient because of the presence and use of electricity.

Bohol Island State University Main Campus (BISU MC) is one of the universities in the province of Bohol that utilizes a considerable bulk of electrical energy. Its four colleges: College of Engineering and Architecture, College of Teacher Education, College of Industrial and Allied Sciences, and College of Business, Arts, and Sciences have their own electrical equipments and facilities that provide convenience to teachers and students in the conduct of their teaching learning activities.

Moreover, the enrolment of the university had increased noticeably over the past years. These are contributory to the school's need for additional facilities and sufficient electrical supply. It is aggravated by the physical aspects of the present electrical system. Some of electrical installations of the campus do not conform to the established standards of the Philippine electrical code. The electrical experts within the campus had observed the nuisance tripping of protective device and sometimes the sparks in the electrical connections. These are indications of a make-shift installation of electrical wiring. The preceding situations had moved the group of researchers from the electrical engineering to conduct a study of the present BISU electrical system. Faulty electrical connections mean greater input but lesser output. In other words, the university is paying more than what it receives in terms of electrical consumption. As a consumer, it is fair for BISU to pay the services that it actually consumes.

## MATERIALS AND METHODS

Actual inspection of the electrical devices, equipment, and wiring methods was done by the researchers. After the study was conducted, the data gathered were then analyzed and interpreted. The researchers will formulate a development plan for the energy-saving measures.

Questionnaires were also distributed to experts in electrical wiring and connections. They include the Electrical Technology and Electrical Engineering faculty of the university.

## RESULTS AND DISCUSSION

Table 1. The profile of electrical energy consumption of BISU-MC year 2010

<b>ELECTRICAL CONSUMPTION</b>		
<b>2010</b>		
<b>MONTH</b>	<b>KWHR</b>	<b>COST(pesos)</b>
January	30706	183379.88
February	52011	310609.95
March	41541	248085.28
April	28193	168369.69
May	26623	158994.46
June	38014	227023.84
July	34772	207662.72
August	47666	284663.71
September	48698	290829.01
October	55702	332654.13
November	36880	220251.98
December	42464	253596.53
<b>ELECTRICAL CONSUMPTION</b>		
<b>2011</b>		
<b>MONTH</b>	<b>KWHR</b>	<b>COST</b>
January	43460	259545.22
	<b>Average cost</b>	
240510.10		

As reflected in Table 1, the energy consumption rates during the months of February, August, September, and October are greater than the other months' consumption of the same year. The researchers have found out that the months with greater energy consumption are school months where the equipments were being constantly used. The rest of the months were vacation periods. The peak months were February and October. This is because most of the students in the shop classes were given semestral projects near the end of the semester.

Table 2. Electrical loads of BISU-MC

	Convenience Outlet	Lighting	Aircon	Cooking & Heating	Motor Loads	Total (Watts)
Building	(Watts)	(Watts)	(Watts)	(Watts)	(Watts)	
Engineering Building	48136	28878	14625	1000		92639
Science & Math Building	17400	3120	1500	1000		23020
Extension Buildings	10800	480	3000			14280
Electronics Building	12600	2000	5625	1000		21225
Automotive & Computer Bldg.	16200	5440	3000	1000		25640
WAF Building	25200	4800	12000		80000	122000
Hometel & Multimedia	16000	3440	25875	3000		48315
Gymnasium	3600	11800				15400
Decorative lights	500					500
Covered walk	220					220

As can be seen in Table 2, the WAF building has registered the highest electrical energy consumption among the buildings. This may be attributed to the large electrical consumption of the equipment found

in the building. Furthermore, all welding equipments are plugged in to the electrical power source of the said building. The Refrigeration and Air Conditioning Department is also located in the said building.

The satisfaction rate of the experts regarding electrical supply is “satisfactory”, safety standard of electrical system is “fair”, maintenance program is “fair”, and the implementation of school project facilities that also utilize existing electrical system is “fair”.

The Implementation category got a description of “poor”. This means that the plans for the electrical system have not been realized. There have been no maintenance report documentation and report for maintenance variance report of budget against expenditure. Had this been done, the electrical system of the school would have been more effective and functional. Generally, the rating is “fair”.

There must be an approved program for the maintenance of the BISU Main Campus electrical system and its personnel. The personnel should not be the instructors themselves but designated electrical technologists must be hired. Furthermore, there should be a periodic inspection so that defects may be detected and given remedies the earliest time possible to avoid accidents.

A fund allotment should be imposed for the maintenance and personnel. The university must purchase more electrical supplies, tools and equipment solely for electrical maintenance. There must also be a separate maintenance shop for maintenance purpose only. An alternative electrical power source should be employed by the university such as the solar power. Because of the very high and expensive electrical energy consumption, there is a need to use a more efficient alternative source and that is the solar power.

## LITERATURE CITED

Geddes & Grosset

2002 *Webster's universal dictionary and thesaurus*. Poland: ISBN 184205 189 X.

Fink, D. & H. Beaty

2002 *Standard handbook for electrical engineers*. India: The McGraw-Hill Companies, Inc.

Jaiswal, M.

2006 *Encyclopedia of electrical engineering*. New Delhi India: ANMOL Publications PVT. LTD.

McPartland, J. & B. McPartland, (Eds.)

1999 *National electrical code handbook*. USA: the McGraw-Hill Companies, Inc.

The Institute of Integrated Electrical Engineers of the Philippines, Inc.

2000 *Philippine electrical code*. Quezon City:

Pursuant to the international character of this publication, the journal is indexed by the following agencies: (1)Public Knowledge Project, a consortium of Simon Fraser University Library, the School of Education of Stanford University, and the British Columbia University, Canada; (2) E-International Scientific Research Journal Consortium; (3) Philippine E-Journals; and (4) Google Scholar.

