

**DESIGN AND CONSTRUCTION OF A MERRY-GO-ROUND
POWERED GENERATING SYSTEM**

Design Project

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ABSTRACT

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The general objective of the study was to design and construct a merry-go-round powered generating system using human physical energy. Specifically, it aimed to: 1. determine the size of the merry-go-round; 2. determine the size of the generator that will be used; 3. assemble of the system; 4. test and evaluate the system in terms of performance and efficiency and; 5. conduct cost computation. The study was conducted at Daang Amaya III Tanza, Cavite from December 2015 to June 2016.

The study covered the design and construction of a merry-go-round powered generating system, which includes a 120W permanent magnet DC generator, an 18 inches diameter pulley, a three inches diameter pulley, 40AHr rechargeable sealed lead acid battery, 1000W 12V to 220V inverter, and a 24V 5A charge controller. Testing and evaluation were done by four participants with different weights and combination of riders in the merry-go-round. The project was evaluated for a duration of 60 seconds per set of different weight of participants. The parameters such as number of rotations, rotational speed, voltage, current, power output, charge percentage added to the battery and efficiency were measured. The results of the evaluation showed that the maximum power output of the system is 16W and the maximum charge percentage added to the battery within 60s is 0.06% affected by the different weights and behaviors of its riders.

The total cost of the study was P 19, 200.

TABLE OF CONTENTS

	Page
BIOGRAPHICAL DATA	iii
ACKNOWLEDGMENT	v
ABSTRACT	ix
LIST OF TABLES.....	xiii
LIST OF FIGURES.....	xv
LIST OF APPENDIX TABLES.....	xviii
LIST OF APPENDIX FIGURES.....	xx
LIST OF APPENDICES	xxii
INTRODUCTION	1
Statement of the Problem	2
Objectives of the Study	3
Significance of the Study	3
Time and Place of the Study	4
Scope and Limitation of the Study	4
Definition of Terms	4
REVIEW OF RELATED LITERATURE.....	6
METHODOLOGY	26
Materials.....	26
Methods.....	27

RESULTS AND DISCUSSION.....	40
Principles of Operation	40
Description of the System.....	41
Determination of the size of the merry-go-round.....	41
Components of the system.....	42
Generator Specifications.....	42
Battery Specifications.....	43
Charge Controller Specifications.....	44
Inverter Specifications.....	44
Diode Specifications.....	45
Pulley.....	46
Assembly of the system.....	47
Installation and Connection of the System.....	48
Testing and Evaluation of the merry-go-round powered generating system	49
Power Output of the System.....	75
Cost Computation.....	76
SUMMARY, CONCLUSION, AND RECOMMENDATIONS	77
Summary.....	77
Conclusion.....	78

Recommendations.....	78
REFERENCES.....	80
.	
APPENDICES.....	81

LIST OF TABLES

Table		Page
1	The age and the weights of the participants.....	50
2	Comparison of actual rotational speed of two pulleys in one rider.....	50
3	Comparison of actual rotational speed of two pulleys in one rider by spinning it themselves.....	50
4	Comparison of actual rotational speed of two pulleys in two riders.....	51
5	Comparison of actual rotational speed of two pulleys in two riders by spinning it themselves.....	51
6	Comparison of actual rotational speed of two pulleys in three riders.....	51
7	Comparison of actual rotational speed of two pulleys in three riders by spinning it themselves.....	52
8	Comparison of actual rotational speed of two pulleys in four riders.....	52
9	Comparison of actual rotational speed of two pulleys in four riders by spinning it themselves.....	52
10	Results of evaluation of merry-go-round powered generator in 60 seconds in one rider.....	58
11	Results of evaluation of merry-go-round powered generator in 60 seconds in one rider by spinning it themselves.....	58
12	Results of evaluation of merry-go-round powered generator in 60 seconds in two riders.....	59
13	Results of evaluation of merry-go-round powered generator in 60 seconds in two riders by spinning it themselves.....	59
14	Results of evaluation of merry-go-round powered generator in 60 seconds in three riders.....	60
15	Results of evaluation of merry-go-round powered generator in 60 seconds in three riders by spinning it themselves.....	60
16	Results of evaluation of merry-go-round powered generator in 60 seconds in four riders.....	61

17	Results of evaluation of merry-go-round powered generator in 60 seconds in four riders by spinning it themselves.....	61
18	Charge percentage added to the battery in 60 seconds in one rider.....	67
19	Charge percentage added to the battery in 60 seconds in one rider by spinning it themselves.....	67
20	Charge percentage added to the battery in 60 seconds in two riders.....	68
21	Charge percentage added to the battery in 60 seconds in two riders by spinning it themselves.....	68
22	Charge percentage added to the battery in 60 seconds in three riders.....	69
23	Charge percentage added to the battery in 60 seconds in three riders by spinning it themselves.....	69
24	Charge percentage added to the battery in 60 seconds in four riders.....	70
25	Charge percentage added to the battery in 60 seconds in four riders by spinning it themselves.....	70
26	Estimated cost of each material needed for the system.....	76

LIST OF FIGURES

Figures	Page
1 Pulley laws - driver and driven - diameter and rpm.....	13
2 Belt length illustration.....	14
3 Children in Essam, Ghana playing with the merry-go-round generator...	16
4 Merry-go-round generator with metal handles.....	18
5 BYU engineering students testing the merry-go-round generator.....	20
6 Human powered revolving door.....	21
7 Merry-go-round generator with wooden handles.....	24
8 Ordinary merry-go-round.....	27
9 Components under the merry-go-round.....	28
10 Torque in merry-go-round.....	29
11 Relation of weight in rotating platform.....	30
12 Block diagram of merry-go-round powered generating system.....	34
13 Front view of merry-go-round powered generating system.....	38
14 Isometric view of merry-go-round powered generating system.....	39
15 Flow chart diagram of the system.....	40
16 Actual merry-go-round powered generating system.....	41
17 Base, shaft and platform of the merry-go-round.....	42
18 DC generator.....	42
19 Battery.....	43
20 Charge controller.....	44
21 Inverter.....	45

22	Diodes.....	45
23	Pulleys.....	46
24	Assembly of merry-go-round.....	47
25	Interconnection of the system.....	48
26	Installation of the system.....	49
27	Comparison of actual rotational speed of two pulleys in one rider.....	53
28	Comparison of actual rotational speed of two pulleys in one rider by spinning it themselves.....	53
29	Comparison of actual rotational speed of two pulleys in two riders.....	54
30	Comparison of actual rotational speed of two pulleys in two riders by spinning it themselves.....	54
31	Comparison of actual rotational speed of two pulleys in three riders.....	55
32	Comparison of actual rotational speed of two pulleys in three riders by spinning it themselves.....	55
33	Comparison of actual rotational speed of two pulleys in four riders.....	56
34	Comparison of actual rotational speed of two pulleys in four riders by spinning it themselves.....	56
35	Results of evaluation of merry-go-round powered generator in 60 seconds mass in one rider.....	62
36	Results of evaluation of merry-go-round powered generator in 60 seconds mass in one rider by spinning it themselves.....	63
37	Results of evaluation of merry-go-round powered generator in 60 seconds in two riders.....	63
38	Results of evaluation of merry-go-round powered generator in 60 seconds in two riders by spinning it themselves.....	64
39	Results of evaluation of merry-go-round powered generator in 60 seconds in three riders.....	64
40	Results of evaluation of merry-go-round powered generator in 60 seconds in three riders by spinning it themselves.....	65

41	Results of evaluation of merry-go-round powered generator in 60 seconds in four riders.....	65
42	Results of evaluation of merry-go-round powered generator in 60 seconds in four riders by spinning it themselves.....	66
43	Charge percentage added to the battery in 60 seconds in one rider.....	71
44	Charge percentage added to the battery in 60 seconds in one rider by spinning it themselves.....	71
45	Charge percentage added to the battery in 60 seconds in two riders.....	72
46	Charge percentage added to the battery in 60 seconds in two riders by spinning it themselves.....	72
47	Charge percentage added to the battery in 60 seconds in three riders.....	73
48	Charge percentage added to the battery in 60 seconds in three riders by spinning it themselves.....	73
49	Charge percentage added to the battery in 60 seconds in four riders.....	74
50	Charge percentage added to the battery in 60 seconds in four riders by spinning it themselves.....	74

LIST OF APPENDIX TABLE

Appendix Table		Page
1	The age and the weights of the participants.....	82
2	Comparison of actual rotational speed of two pulleys in one rider.....	82
3	Comparison of actual rotational speed of two pulleys in one rider by spinning it themselves.....	82
4	Comparison of actual rotational speed of two pulleys in two riders.....	83
5	Comparison of actual rotational speed of two pulleys in two riders by spinning it themselves.....	83
6	Comparison of actual rotational speed of two pulleys in three riders...	84
7	Comparison of actual rotational speed of two pulleys in three riders by spinning it themselves.....	84
8	Comparison of actual rotational speed of two pulleys in four riders....	84
9	Comparison of actual rotational speed of two pulleys in four riders by spinning it themselves.....	85
10	Results of evaluation of merry-go-round powered generator in 60 seconds in one rider.....	86
11	Results of evaluation of merry-go-round powered generator in 60 seconds in one rider by spinning it themselves.....	86
12	Results of evaluation of merry-go-round powered generator in 60 seconds in two riders.....	87
13	Results of evaluation of merry-go-round powered generator in 60 seconds in two riders by spinning it themselves.....	87
14	Results of evaluation of merry-go-round powered generator in 60 seconds in three riders.....	88
15	Results of evaluation of merry-go-round powered generator in 60 seconds in three riders by spinning it themselves.....	89

16	Results of evaluation of merry-go-round powered generator in 60 seconds in four riders.....	89
17	Results of evaluation of merry-go-round powered generator in 60 seconds in four riders by spinning it themselves.....	90
18	Charge percentage added to the battery in 60 seconds in one rider.....	91
19	Charge percentage added to the battery in 60 seconds in one rider by spinning it themselves.....	91
20	Charge percentage added to the battery in 60 seconds in two riders.....	92
21	Charge percentage added to the battery in 60 seconds in two riders by spinning it themselves.....	92
22	Charge percentage added to the battery in 60 seconds in three riders...	93
23	Charge percentage added to the battery in 60 seconds in three riders by spinning it themselves.....	93
24	Charge percentage added to the battery in 60 seconds in four riders....	94
25	Charge percentage added to the battery in 60 seconds in four riders by spinning it themselves.....	94

LIST OF APPENDIX FIGURES

Appendix Figure		Page
1	3D Block diagram of merry-go-round powered generating system with specifications.....	96
2	Generator.....	96
3	Generator casing.....	96
4	Battery.....	97
5	Charge controller.....	97
6	Inverter.....	97
7	Pulley under the merry-go-round.....	98
8	Component's case.....	98
9	Front view of the component's case.....	98
10	Tachometer reading in generator.....	99
11	Installation of the system.....	99
12	Voltmeter and ammeter reading.....	99
13	Evaluating one rider in 60 seconds.....	100
14	Evaluating two riders in 60 seconds.....	100
15	Evaluating three riders in 60 seconds.....	101
16	Evaluating four riders in 60 seconds.....	101
17	Evaluating one rider in 60 seconds by spinning themselves.....	102
18	Evaluating two riders in 60 seconds by spinning themselves.....	102
19	Evaluating three riders in 60 seconds by spinning themselves.....	103

20	Evaluating four riders in 60 seconds by spinning themselves.....	103
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LIST OF APPENDICES

Appendix		Page
1	Appendix Tables	81
2	Appendix Figures.....	95
3	Computations.....	104
4	Manual of Operation.....	120
5	Letters.....	127

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An undergraduate design project presented to the faculty of the Department of Computer and Electronics Engineering, College of Engineering and Information Technology, Cavite State University, Indang, Cavite in partial fulfillment of the requirements for the degree of Bachelor of Science in Electrical Engineering with Contribution No. _____, (BSEE) prepared under the supervision of Engr. Efren R. Rocillo.

INTRODUCTION

Renewable energy demand increases due to devouring resources of energy. It involves the production, harnessing and application of sustainable resources to make man's everyday lives easier. A day without electricity is always hard to imagine, some people only experience it when blackout or brownout occurs. But there are places, mostly rural, that the electricity are certainly absent and that's the reason why the generators are pursued to be invented. An electric generator is a machine that converts rotary mechanical energy into electrical energy which forces electric current to flow through an external circuit. Mechanical energy can be applied by a water pressured waterwheel, wind turbine, steam turbine engine or another source of mechanical energy. One example of an alternative source of mechanical energy is the rotation of a merry-go-round just like in the rotation of the windmill to harness electricity. This rotation give such as kinetic energy and gravitational potential energy. With these energies it can produce mechanical