De La Salle University – Dasmariñas

"Bagasse Used in Steam Power Plant as an Energy Supply Alternative for Sugar Industry"

In Partial Fulfillment for the Requirement on the Course

Bachelor of Science in Industrial Technology

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ABSTRACT

Name of the Institution: De La Salle University Dasmariñas Cavite

Location: Dasmariñas Cavite

Research Title: "Bagasse Used in Steam Power Plant as an Energy Supply Alternative for Sugar Industry"

Proponent: Torres, Emerson S.
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Source of fund: From the parents of the researchers

Cost: Php 2,000

Date Started: December 2001

Date Finished:

Objective:

A. General Objective

To propose the use of steam power plant to other Sugar Company and the use of Bagasse as an alternative fuel for Bunker oil in Boiler process.

B. Specific Objective

a. To find out the difference in Cost, Steam generation, and Efficiency in using Bagasse as fuel

Scope and Coverage:

The authors of this study focus on the operation of boiler plant and will tackle briefly the operation of steam generator. However this study covers only those sugar and a little bit of mechanical forest industry.

Methodology:

This study use a causal comparative of cost, generation, and efficiency of using bagasse and bunker fuel oil to provide sufficient data in choosing the perfect fuel for the boiler.

The following are the Respondent of the study:

- Supervisor's namely *Ms. Susana Urbanoso* and *Jessie Demefelix*
- Engineers
- In-charges personnel in the boiler department and electrical department of Central Azucarera Don Pedro

The thesis used the quality manual of the said company to identify the right personnel to interview. Then the authors first interview those personnel in the engineering department regarding the process flow of operation. Then in the boiler department where the author interview some of the engineer about the process of the boiler, generation and feeding flow of bagasse lastly in the electrical department where the steam consumption of the company are given.

Major Findings:

Using the table 2 the following were calculated in the study:

1.) To compute for the total fuel cost in using bunker oil

= Average fuel oil consumption lt./day x Php 10.00/Liter bunker oil

= 179,608.8900 lt/day x Php 10.00/Liter bunker oil

= **Php 1,796,088.9/day**

2.) To compute for the total fuel cost in using Bagasse

= Average Bagasse consumption Lbs/day x Php 0.00

= 2,842,224.0520 Lbs/day x Php 0.00

= Php 0.00

3.) To compute for the Total Fuel saving cost

= Total fuel cost in using bunker oil - Total fuel cost in using Bagasse

= Php 1,796,088.9/day - Php 0.00

= Php 1,796,088.9/day

4.) To compute for the total Steam Generation in using Bagasse

= Bagasse consumption x 2.300 Lbs. Steam/ Lbs of Bagasse

= 2,842,224.0520 Lbs. Steam/day x 2.300 Lbs. Steam/ Lbs of Bagasse

= 653,7115.2 Lbs. Steam/day or 2964.6781 ton/day

5.) To compute for the total Steam Generation in using Bunker oil

= Bunker oil consumption lt./day x 27.2300 lbs. Steam/ lt. Bunker oil

= 179,608.8900 lt/day x 27.2300 lbs. Steam/ lt. Bunker oil

= 4,890,750.1 lbs. Steam/day

Using table 3 the following were calculated:

1.) To Compute for the Electric Generation of the proposed 5000 kWh Electric Generator

= 5,000 kWh x 24 hour

= 120,000kWh/day

= 120,000kWh/day x 91 day

= 10,920,000 kWh / Quarter of a year is sufficient enough to generate

5,411,564 kWh/Quarter of year and can exceed up to 10,920,000 kWh

Conclusion:

Energy management is not a sometimes thing. It is a continual commitment of all effort to be as efficient in operation as is economically feasible a word of caution though. In our Enthusiasm to conserve and manage energy, we must not fail to recognize the environmental priorities require by manufacturing health care, and other people and product – intensive facilities. We cannot arbitrarily sacrifice all comport as production in favor of energy conservation.

Recommendation:

For Small-Scale Mechanical Forest Industry

The author recommends that if the company is financially stable they may put 15,000 MW steam generator in able supply sufficient energy and heat for their operation. They can use bagasse feeder inlet chutes, bagasse feeder, bagasse feeder discharged chutes, and bagasse distribution to satisfy the feeding process of bagasse.

Recommended major factor for optimum efficiency

Considered in the choice of boiler plant

I Design Criteria

- Pressure and Temperature – Min press., saturated or superheated
- Load and Demand – Near max, proper sizing
- Turn-down ratio – Highest possible
- Draft – Natural, Mechanical, pollution control
- Ratio of secondary to primary heating surface no. of pass – highest possible
- Heat recovery devices – Superheated, Economizer, Air heater, Downcomers
- Co – generation possibilities – Base load, Electric cost

II Fuel and Burners

- Cost, Availability, Quality
- Solid Fuel firing – Grate, Suspension, Fluidized

- Oil Firing – Jet, Blast, Rotary
- Combustion of oil and fuels

III Controls – Manual, Semi-automatic, and fully automatic

IV Service ability – Ease of servicing in service, outage, parts availability.

V Standard of Labor employed – Training, Supervision