POWER REQUIREMENT OF COLOMBO PORT FOR THE NEXT 15 YEARS AND A SLPA OWNED POWER PLANT TO MEET THE FUTURE DEMAND

A dissertation submitted to the
Department of Electrical Engineering, University of Moratuwa
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By

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Abstract

The port of Colombo is the hub port in the South Asian region. The number of containers handled at the port has been on the increase over two decades. To meet this increasing container business, there are long term and short term development plans. Some have been completed and others are in the planning stage.

Electrical power requirements increase with the increase in the container volume handled. Increased operation and competition in the industry requires faster turn-around, for which a reliable power supply is essential. The use of sensitive equipment in ports also requires a higher power quality. An outage of electricity supply is estimated to cost about 30,000US$/hour to the Colombo Port. Furthermore, when power supply is restored, all port activities cannot begin simultaneously but follow a sequence.

The objective of this research was to examine way of increasing power reliability and power quality as well as to minimize the cost of power with the increasing port activities. The period considered was 2006 to 2020.

In this study present electricity demand at the port of Colombo was calculated. For this all the port facilities were considered. Then the total electricity consumption was calculated by considering the power usage by each port facility. Then the future forecast of the power demand for the period 2006 to 2020 was done. For this forecast, the past data of container throughput at the port of Colombo, Electricity Tariff of Ceylon Electricity Board, Sri Lankan Rupees fluctuation against US$, price of Diesel fuel, price of heavy oil fuel and generation of electricity by standby Diesel generators due to Ceylon Electricity Board power outages were taken. Also future developments of the port facilities and other organizations inside the port were taken into account.
By using the results of the forecast, the financial calculation was done for the period 2006 to 2020.

The same analysis was repeated by ignoring the inflation.

The analysis clearly shows that the self generation of electricity is beneficial to the port both in financial saving and power reliability and quality and will directly impact on the efficient and reliable port activities. Using the analysis a decision can be taken to improve the power supply to meet the power requirement of the port of Colombo with increasing port activities in the future.

DECLARATION

The work submitted in this dissertation is the result of my own investigation, except where otherwise stated.

It has not already been accepted for any degree, and is also not heing concurrently submitted for any other degree.

P.A.R.D.Pathiraja
20 . 01.2006

We/I endorse the declaration by the candidate.

UOM Verified Signature

Dr. Tilak Siyambalapitiya

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Dr. Lanka Udawatta

CONTENTS

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List of Figures:

List of Tables: