DEVELOPMENT OF HYBRID POWER SYSTEM CONTROLLER FOR MOBILE TELECOM BASE STATIONS

A dissertation submitted to the

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by

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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 being concurrently submitted for any other degree.

UOM Verified Signature

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Date : 31st October 2011.

I endorse the declaration by the candidate.

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Abstract

Most of the telecom base stations are sited at elevated locations to get best signal propagation. If the area is isolated and away from the national grid of commercial power, it will involve higher capital investments for extending the grid to obtain commercial power, leaving the base station to be none profitable and none cost recovering. Moreover, until the grid power connection, which involves considerable time period for grid extension, base station will be required to operate with full time generator operation, further reducing the profitability of the project.

As a solution, to match the remote site constraints, alternative energy systems can be considered. A power system controller has been developed which suits for telecom base stations to integrate alternative energy sources, solar and wind with the generator and the battery backup to fulfill the power requirements of base stations, which reduces the operation cost as well as Total Cost of Ownership (TCO) for the base station.

Installation of the controller and implementing alternative energy system at a Dialog base station, practical data were obtained which showed an operational cost saving nearly 90%.Most importantly, the calculated payback period was less than three years when compared with full time generator operation, with the practical details obtained from the operational site.

Dedication

I dedicate this dissertation to my loving parents.

Acknowledgement

First I would like to thank to Dr. J.P.Karunadasa for guiding me to successfully complete this research within the time frame. As the research supervisor, he directed me to find all necessary literature and to do the research work to the standards.

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PV	Photovoltaic
CAPEX	Capital Expenditure
OPEX	Operational Expenditure
HT	High Tension
NPV	Net Present Value
ROI	Return On Investment
BTS	Base Transceiver Station
MPPT	Maximum Power Point Tracking