SOLVING
THE UNDER VOLTAGE PROBLEM IN
SRI LANKAN NATIONAL GRID

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To My Parents and My Wife

PREFACE

This dissertation includes the individual project details/results which has been completed as a part of Master of Engineering Program at Department of Electrical Engineering in University of Moratuwa, Sri Lanka in 2001.

In completion of this individual research project it was selected the " Electrical Power Transmission Network" in Sri Lanka as the area of study.

This research is a attempt to model the existing system as possible and simulate the existing under voltage condition and to find the various remedial actions for this voltage collapse.

How close is a system to voltage instability, may be measured in terms of physical quantities, such as load level, active power flow through a critical interface, and reactive power reserve. Considerations were given to possible contingencies such as; loss of reactive power sources, generating units and loss of critical lines.

In order to have a proper model and to find better solutions EMTDC/PCAD ver 3.0.0 personnel edition was used. This is a time–domain simulator and with that it was possible to have a better dynamic model which is very much closer to the existing one. On line plotting of time varying quantities, gave a great ease of modeling & checking the proposals.

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1. OBJECTIVES AND METHODOLOGIES

The main objective of this research study is to find a low cost solution for the existing under voltage situation in Sri Lankan power transmission system.

In completion of this objective the following methodologies were used ;

a. Study the existing Sri Lankan Power transmission network with generator busses and load busses.

b. Model this transmission system in a computer using computer aided software and have a dynamic model.

c. Testing and tuning of the model with existing values.

d. Implementation of proposals and produce the results.