DESIGN A CONTINGENCY ELECTRICITY FEEDING PLAN
A CASE STUDY: DEHIWALA AREA

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(108887 L)

Degree of Master of Science

Department of Electrical Engineering

University of Moratuwa

Sri Lanka

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Thesis/Dissertation submitted in partial fulfillment of the requirements for the degree

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DECLARATION

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G. K. A. Kumara Date

The above candidate has carried out research for the Masters Dissertation under my supervision.

……..

Dr. Udayanga Hemapala.
Faculty of Engineering
University of Moratuwa

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Date

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ABSTRACT

CEB is mainly Electricity Generating, Distributing and solely Electricity Transmitting organization in Sri Lanka. Few years back, main target of CEB was to achieve 100% electrification level and was not greatly concerned about the reliability of electricity supply. Presently Sri Lanka has achieved 96% electrification level [01]. It is expected to reach 100% with in next few years.

Presently CEB is providing electricity supply to 90% consumers and LECO is providing electricity to the remaining 10% consumers in Sri Lanka [02]. Once electricity is there the consumers will be more concerned about supply reliability.

Nowadays most human activities depend on the electricity supply availability. Therefore electricity service providers need to provide reliable supply to consumers. Electricity supply reliability can be improved providing N-1, N-2, and N-3 electricity feeding plans. At least CEB need to provide N-1 electricity feeding arrangement to their consumers.

Dehiwala area is selected for case study to observe the availability of N-1 feeding arrangement and find new proposals if it is not available. This study is done only for MV lines. All peak load details of transformers were collected and model the MV network for year 2014 through Synergee software. Then acceptable growth rate was applied and forecasted SynerGEE model for year 2020 was created. Based on that the availability of N-1 feeding arrangement for model of year 2020 was examined.

New suggestions have been proposed considering availability, construction ability and cost where N-1 feeding arrangement is not available. Cost estimation also was prepared these sites. SAIDI value has been calculated for before and after implementing the proposals. It is clearly noted that SAIDI is improved considerably after implementing the new proposals. Three common models are developed to extend this study for other Distribution areas.

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LIST OF ABBREVITIONS

Abbreviation	Description
A	Amperes
CEB	Ceylon Electricity Board
LECO	Lanka Electricity Company (Pvt) Ltd
GS	Grid Substation
PS	Primary Substation
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
F	Feeder
MV	Medium Voltage
kV	Kilo Volts
N/A	Not Available
Att	Attidiya
Dehi	Dehiwala
Kalu	Kalubowila
RMU	Ring Main Unit
AGA	Assistant Government Agents
LBS	Load Break Switch
Sw	Switch
SIN	Substation Identification Number
B	Bulk
D	Distribution
CSC	Consumer Service Centre

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