

**IMPROVEMENTS TO MAINTENANCE AND
OPERATION PRACTICES TO ACHIEVE BETTER
RELIABILITY IN DISTRIBUTION NETWORK**

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Dissertation submitted in partial fulfilment of the requirements for the
degree Master of Science in Electrical Engineering

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DECLARATION

I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement made in the text.

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ABSTRACT

With the growing concerns on depletion of fossil fuels and enhancing demand for green energy the need of an alternative source of energy has arose. As a replacement to fossil fuel driven engines and machineries, electrically driven machineries and equipment have found way ahead. As a substitute to fossil fuel, electricity plays a vital role in supplying energy to world at present. With the enhancement of luxury living, the use of tools and machinery at home as well as in the industry, the man is forced to concern on the quality of electricity supply they receive.

The concept of reliability is considered as one of the priorities of the electricity utilities in order to improve customer satisfaction. There are interruptions to power supply unexpectedly due to unavoidable circumstances as well as planned interruptions for system maintenance and construction work in the system.

This project focuses on approaches for making the best use of outage data to plan interruptions for system maintenance work to minimize the frequency of interruptions and the duration of interruptions to improve reliability.

The three power quality problems discussed here are the voltage sags, momentary interruptions and sustain interruptions caused by faults on the utility power system, with most of them on the distribution system. This project concentrates on distribution maintenance, operation and construction practices that can be used to minimize interruptions and their impact on customers in Western Province South-II.

This project identifies the weaknesses of the existing operation and maintenance practices. Determine ways and means to minimize frequency of break downs and power failures to improve the quality of power supply and its reliability. Also propose remedial solutions to be taken for improving reliability of the system. Calculate reliability indices, System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) to assess the reliability level. Find solutions and propose remedial action to be taken to improve reliability of the system.

TABLE OF CONTENTS

Declaration	i
Acknowledgements	ii
Abstract.....	iii
Table of Contents	iv
List of Figures.....	vii
List of Tables	viii
List of Abbreviation.....	ix
List of Appendices.....	xi
Chapter 1	1
Introduction	1
1.1 Background.....	1
1.2 Objective.....	3
1.3 Scope of Work	4
1.4 Thesis Organization	4
Chapter-2	6
Western Province South II.....	6
2.1 Research Area.....	6
2.2 Area Description.....	9
2.3 Failure Types	10
2.3.1 Medium Voltage (MV) Failures.....	10
2.3.2 Low Voltage (LV) Failure.....	12
2.3.3 MV Switching	13
2.3.4 LV Switching	13
2.3.5 Auto Grid Tripping.....	13
2.3.6 Manual Grid Tripping	13
2.3.7 Service Maintenance (SM) Failures.....	13
2.4 Causes For System Outages / Current Practices	15
Chapter 3	19

Methodology.....	19
3.1 Updating The Single Line Diagram Of MV Network.	19
3.2 Data Collection	20
3.3 Interruption Scheduling	21
3.4 Procedure	22
Chapter 4	23
Analysis And Results	23
4.1 MV Failures	26
4.2 LV Failures	27
4.3 SM Failures.....	28
Chapter 5	38
Calculation.....	38
5.1 Definition Of Reliability.....	38
5.2 Reliability Indicators By Electric Power Utilities.	38
5.3 Sample Analysis.....	39
5.3.1 Case Study (1) - Malabe CSC.....	39
5.3.2 Case Study (2) - Homagama CSC.....	41
5.3.3 Case Study (3) -Bulathsinghala CSC.....	43
5.4 Genaralization.....	45
Chapter 6.....	48
Interruption Intimation Sheet.....	48
6.1 Format of the Interruption Intimation Sheet.....	48
6.2 Procedure for Preparing Interruption Plan.....	48
Chapter 7.....	49
Conclusion and Recommendation.....	49
7.1 Conclusion.....	49
7.2 Recommendation.....	50
Appendix A: Interruption schedule for the month of January – SJ’pura Area.....	52
Appendix B: Interruption schedule for the month of January – Homagama Area.....	55

Appendix C: Interruption schedule for the month of February – Horana Area.....	57
Appendix D: Interruption schedule of Bandaragama Area.....	59
Appendix E: Interruption schedule for the month of January 2016-Avissawella Area..	60
Appendix F: Format of the Interruption Intimation Sheet.....	62
Appendix G: Completed Final Approved Interruption Intimation Sheet.....	63

LIST OF FIGURES

Figure 1:Area Distribution of WPS II	7
Figure 2 : Uncleared Way Leaves.....	15
Figure 3: Disturbance by way leaves.....	15
Figure 4: Damage fuse boxes	16
Figure 5: Poor workmanship	16
Figure 6: Negligence of workman.....	17
Figure 7: Poor workmanship	17
Figure 8: Neatly arrange substation.....	18
Figure 9: Abandoned power line	18
Figure 10:Single Line Diagram.....	19
Figure 11: SAIDI January 2016 – WPS II.....	23
Figure 12: SAIDI February 2016 – WPS II.....	25
Figure 13 : Area wise MV Failures during year 2016	26
Figure 14 : Area wise LV Failures during year 2016	28
Figure 15 : Area wise SM during year 2016	29
Figure 16 : Area wise total number of failures 2016	30
Figure 17 : Area wise SAIDI for year 2016	31
Figure 18 : Annual SAIDI	32
Figure 19 : Area wise SAIFI for year 2016	33
Figure 20 : Annual SAIFI.....	33
Figure 21 : Variation of SAIDI during 2016 – Horana area failure type wise.....	35
Figure 22 : Variation of SAIFI during 2016 – Horana area failure type wise.....	37

LIST OF TABLES

Table 1:Consumer Distribution in WPS II	8
Table 2:Transformer Distribution in WPS II.....	8
Table 3:MV Failures.....	11
Table 4:LV Failures.....	12
Table 5:SM Failures	14
Table 6 : SAIDI February 2016	24
Table 7 : SAIFI February 2016	24
Table 8: Number of MV failures area wise	26
Table 9 : Number of LV failures area wise	27
Table 10 : Number of SM failures area wise.....	28
Table 11 : Total number of failures area wise	29
Table 12 : SAIDI (min)	30
Table 13 : SAIFI for year 2016	32
Table 14 : SAIDI Horana area	34
Table 15 : SAIFI Horana area	36
Table 16: Planned Interruption Schedule of Malabe CSC for January 2016.....	40
Table 17 : Planned interruption schedule of Homagama CSC for January,2016.....	42
Table 18 : Planned interruption schedule of Bulathsinghala CSC for February,2016	44
Table 19 : Schedule of interruptions with adjustments - Bandaragama.....	46
Table 20 : Schedule of interruptions with adjustments - Avissawella	46

LIST OF ABBREVIATIONS

A	Air break switch
AV	Awissawella
BG	Bandaragama
BL	Bulathsinghala
CEB	Ceylon Electricity Board
CSC	Consumer Service Center
D	DDLO
DD2	Distribution Division 2
DD3	Distribution Division 3
DD4	Distribution Division 4
DDI	Distribution Division 1
DDLO	Drop Down Lift Off
DM	Distribution Maintenance
HM	Homagama
HN	Hanwella
HR	Horana
HT	High Tension
IN	Ingiriya
L	Load break switch

LT	Low Tension
LV	Low Voltage
MB	Malabe
MCCB	Molded Case Circuit Breaker
ML	Millaniya
MV	Medium Voltage
OH	Over Head
P & D	Planning and Development
PD	Padukka
PHM	Projects and Heavy Maintenance
PN	Pannipitiya
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SJ'pura	Sri Jayawardhanapura
SM	Service Maintenance
T/F	Transformer
TL	Thalangama
Tr(O&M)	Transmission Operation & Maintenance
WL	Weliwita
WPS II	Western Province South II

LIST OF APPENDICES

Appendix A: Interruption schedule for the month of January – SJ’pura area.....	52
Appendix B: Interruption schedule for the month of January – Homagama Area.....	55
Appendix C: Interruption schedule for the month of February – Horana Area.....	57
Appendix D: Interruption schedule of Bandaragama Area.....	59
Appendix E: Interruption schedule for the month of January 2016-Avissawella Area..	60
Appendix F: Format of the Interruption Intimation Sheet.....	62
Appendix G: Completed Final Approved Interruption Intimation Sheet.....	63