

RELIABILITY ANALYSIS OF PARALLEL AND MESHED DISTRIBUTION SYSTEM

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“May Allah bless and reward them for their generosity”

ABSTRACT

This project presents the approximate techniques that used to determine the reliability of parallel and meshed distribution of a system. This technique is based on a set of appropriate equation for evaluating the failure rate, outage duration and annual outage time. The results obtained from this method will give sufficient information to calculate the load point reliability indices for the inclusion of busbar failures (IOBF), the inclusion of scheduled maintenance (IOSM) and the temporary or transient failures (TATF). The inclusion of busbar failures (IOBF) is evaluated by considering the outages of busbars. In this case study, the outages of this system can be taken into account using two methods which are network reduction method and failure mode analysis. In the second case study, the inclusion of scheduled maintenance (IOSM) is an outage that involves the removal of a component in order to perform preventive maintenance. IOSM used two alternative policies which are coordinated maintenance and uncoordinated maintenance to evaluate the load point reliability indices for two bus system. And the last cases, TATF consist two types of failures which are damaged and non damaged. In TATF, it considers three overlapping events TATF overlapping TATF, TATF overlapping a permanent failures and TATF overlapping maintenance outages. The significant of this study is to gives convenient and satisfied for customer in their life and also to improve the failures of the system.

TABLE OF CONTENTS

CHAPTER	LIST OF TITLE	PAGE
	DECLARATION	i
	ACKNOLEDGEMENT	ii
	ABSTRACT	iii
	TABLE OF CONTENTS	iv
	LIST OF FIGURES	vii
	LIST OF TABLES	viii
1.0	INTRODUCTION	
	1.1 Introduction	1
	1.2 Project objective	2
	1.3 Organization of this thesis	3
2.0	THEORITICAL BACKGROUND	
	2.1 Introduction	4
	2.2 Definition of reliability	5
	2.3 Basic definitions	5
	2.4 Outage data	6
	2.5 Basic reliability evaluation techniques of distribution system	6
	2.5.1 Approximate method	8
	2.5.2 Network reduction method	8
	2.5.3 Failure mode and effects analysis	8
	2.6 Inclusion of busbar failures	9
	2.7 Inclusion of scheduled maintenance	9
	2.2.1 Coordinated maintenance	10
	2.2.2 Uncoordinated maintenance	10
	2.8 Temporary and transient failures	11

CHAPTER 1

INTRODUCTION

1.1 Introduction

The approximate method (AM) is an alternative method of state space diagrams in which it is based on a set of appropriate equations for evaluating the failure rate, outage duration and annual outage time. This method is an important role in a distribution system reliability evaluation [1]. The approximate method is applicable to determine the distribution reliability for two components in parallel and three components in parallel.

In the approximate method, the inclusion of busbar failures (IOBF) is evaluated by considering the outages of busbars. Failures of these components can be taken into account using both network reduction and failure mode analyses. The network reduction method creates a sequence of equivalent components obtained by gradually combining series and parallel components. The IOBF can be applied for two components in parallel and three components in parallel. In the approximate method, the inclusion of scheduled maintenance (IOSM) is an outage that involves the removal of components in order to perform preventive maintenance. The scheduled maintenance is simulated only on overlapping events associated with parallel and meshed network. The IOSM can be used for two components in parallel and three components in parallel.

In the reliability evaluation of electric distribution systems, the failures that are considered in the analysis are the temporary forced outages and transient forced outages (TATF) which does not damage a component [2]. Service is then restored by closing the breakers automatically and also after the occurrence of temporary or transient forced outage. In either case the outage time is relatively small and may be negligible with automatic closure. The effect on the customer of these types of failures is therefore significantly different from that of failures that require components to be repaired. The transient forced outages are restored by automatic switching. The temporary forced