DESIGNING RELIABILITY INTO INDUSTRIAL AND COMMERCIAL POWER SYSTEM

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"May Alllah bless and reward them for their generosity"

ABSTRACT

One of the failures in a distribution system is due to an increase of load demand which contributes to the unavailability of supply to a customer. This paper presents the application of the simple radial system to evaluate the frequency, average duration of load point interruptions and customer interruption costs being served by various industrial and commercial power system configurations. It is also to determining how the frequency and duration of interruption affected when spare and redundant of the transformer in the system. This method is used for evaluating the capability of the station to supply the power to consumers. There are six different configuration of the industrial power system considered in the analysis of reliability evaluation. The best and the worst configuration of the distribution system can be obtained by referring to the reliability and expected capability output of the cases. The reliability analysis is carry out by considering the effect of lateral distributor protection, effect of protection failures and effect of transferring load. The available literature on this subject generally deals with the failure probabilities. Numerical values are then obtained by further manipulation. This research is very useful to planners toward planning or designing distribution systems considering the most reliable conditions.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The goal of a power is to supply electricity to its customers in an economical and reliable manner. It is important to plan and maintain reliable power systems because cost of interruption and power outages can have severe economic impact on the utility and its customers [1]. Reliability means the ability of a system to perform the function it is designed for under the operating conditions encountered during its projected lifetime. The design of reliable industrial and commercial power distribution systems is important because of the high cost associated with power outages.

The development of modern society has significantly increased the dependency on electric supply availability. The basic function of an electric power system is to supply its customers with electrical energy as economically as possible and with a reasonable degree of continuity and quality [2]. It is not economical and technically feasible to attempt to design a power system with one hundred percent reliability. Therefore, power system engineers attempt to achieve an acceptable level of power system reliability in their planning, design and operation within the existing economic constraints. In order to resolve the conflict between the economic and reliability constraints, a wide range of techniques and criteria has been developed and used in the system design, planning and operating phases. [3]

Reliability is often measured by outage indices defined by the Institute of Electrical and Electronic Engineer (IEEE) Standard 1366 [4].The design of reliable industrial and commercial power distribution systems is important because of the high cost associated with power outages. It is necessary to consider the cost of power outages when making design decisions for new and existing power distribution systems as