Reliability Performance in Distribution System Based on the Amount of Power Supply by Generators and Synchronous Compensators in the System

NoorFatin Farhanie Mohd Fauzi, Nur Nabihah Rusyda Roslan, and Mohd Ikhwan Muhammad Ridzuan

Abstract One of the main aspects in power quality is the reliability in power system. Reliability is known as the continuous supply of the electricity to the consumers. People depend mainly on the electricity in order to continue in their daily life. The performance of reliability can be evaluated by these three main reliability indices which are System Average Interruption Frequency Index (SAIFI), System Average Interruption Duration Index (SAIDI) and Customer Average Interruption Duration Index (CAIDI). The interrupted of the electricity is due to any failure in the network system and inadequate of the power supplied to the system. In power system, the electricity is supplied to the load by generators which supply both real power and reactive power. Other than generators supply the power, the presence of synchronous compensator also is very important as it stabilize the system. This synchronous compensator is only supplies the reactive power to the system. Since, the failure of the reactive power sources rarely considered. Hence, in this paper the amount of power for both reactive power and reactive power are analyzed to observe the effect to the reliability performance in the network.

Keywords Reliability · Distribution · Generator · Synchronous compensators · Reliability performance · Reactive power

1 Introduction

In power system, the term "reliability" must be considered at the level of designing and planning of the system. According to [1], the power system's function is to provide the electricity on demand economically and within reliability and service quality levels. This reliability assessment is a major significant to the electric power system in terms of design, operation and maintenance [2], Reliability is the ability of the system to supply the customers with a continuous services [3]. The reliability in power system should operate in an economic manner with minimal interruption

N. F. M. Fauzi · N. N. R. Roslan · M. I. M. Ridzuan (✉)
Department of Electrical Engineering, College of Engineering, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Pahang, Malaysia
e-mail: ikhwanr@ump.edu.my

Z. Md. Zain et al. (eds.), *Proceedings of the 6th International Conference on Electrical, Control and Computer Engineering*, Lecture Notes in Electrical Engineering 842,
https://doi.org/10.1007/978-981-16-8690-0_3