
Author(s): COA. Awosope et al.


Abstract: This paper is concerned with using the fault analysis to establish the requirements for the proper selection of circuit breaker; A Case Study of Power Holding company of Nigeria (PHCN) 330-kV Transmission Grid System. The work is modelled for Fault Analysis and it is written in a flexible MATLAB programs to accommodate addition or reduction in the Transmission Grid System. It aimed at establishing the Circuit Breaker Capacity at any point in the system. The result is then compared with the existing circuit breaker capacity of PHCN 330-kV system. The short-circuit fault is simulated by combining a solution of algebraic equations describing the changes in the network with a numerical solution of the differential equations. Two MATLAB programs were written and simulated; one for Lord Flow study to know the pre-fault bus voltages based on Gauss-Seidel Method; the other for Short Circuit Studies which made use of Thevenin’s theorem application. The highest Circuit Breaker Capacity established by the result of this study is relatively lower and the investments needed for this are smaller compared with the normal practice with PHCN system. This reveals that PHCN system can be protected with this low capacity circuit breaker with a reduced cost effectiveness and equal sensitivity which is a break-through in terms of Circuit Breaker Capacity in the field of power system Protection.