

**DETECTION OF FAULT AND LOAD INCREASE FOR
DISTANCE RELAY OPERATION USING FFT**

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ABSTRACT

Undesirable operation of distance relays is due to occurrence of load increase but not because of fault. That operation has contributed to voltage collapses worldwide and it has played a part in many major blackouts. This problem occurred because of distance relay failed to differentiate between fault occurrence and load increase in power distribution system. This research presents a new approach to improve the identification of fault occurrence and load increase to prevent distance relay mal-operation. The main objective of this research presented in this thesis is basically focuses on how to differentiate between fault occurrence and load increase in transmission lines. Besides, the other objective is to study the characteristics of fault and load increase and their effects in transmission lines and also to develop the method that can clearly distinguish between fault occurrence and load increase by developing and simulating the IEEE 9 bus test system using PSCAD Software. The analyses of voltage have been done at the corresponding buses of the simulation system. The study on Fast Fourier Transform (FFT) has shown the different of voltage profile between fault and load increase.

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