

Impact of Reactive Compensators on Performance of Distance Protective Relays*

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Abstract

This paper tries to clarify the impact of parallel and serial compensation of power transmission lines on the performance of distance relays which protect these lines. To this end, power system analysis software (NEPLAN) will be used for explaining distance relay behavior in the presence of different parallel or serial reactive power compensators, with main types of faults that may occur in different locations on the protected line.

In this paper, Syrian power transmission network is simulated using (NEPLAN) software, and three reactive power compensators: parallel (STATCOM), serial (TCSC), and unified (UPFC), are used to compensate reactive power on transmission line. Several simulations, in many cases are carried out to illustrate the impact of fault type and location on the measured impedance seen by the distance relay.

The objective of identifying the impact of reactive compensators on fault impedance seen by distance relay (i.e. fault location), is to determine the possible ways to resolve the problem and improve the performance of transmission line protection.

Keywords: Distance relay, Static Synchronous Compensator (STATCOM), Unified Power Flow Controller (UPFC), Flexible Alternating Current Transmission (FACTS), Thyristor Controlled Series Compensator (TCSC).

- For The paper in Arabic see pages (385-399)

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