

عنوان مقاله:

An Investigation of a New Method to Detect Lossess of Excitation of Synchronous Generators

محل انتشار:

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خلاصه مقاله:

Synchronous generators are one of the most important components of power systems. Problems a generator may face are internal faults, system disturbances, or operational hazards. The operation of a generator may easily be affected by faults within the machine itself as opposed to external disturbances occurring on the network to which it is connected. Generator protection must therefore be designed to react efficiently in both conditions. Loss of excitation (LOE) is a common fault in synchronous generators. The most common causes of LOE include the loss of field to the main exciter, accidental tripping of the field breaker, short circuits in the field circuit, and poor brush contact in the exciter. The most widely applied method to detect a generator loss of field condition on major generators is the use of distance relays to sense the variations of impedance as viewed from the generator terminals. This approach may not be able to distinguish between LOE and stable power swing (SPS). This paper further explores a new method proposed for LOE detection and corrects its shortcomings. It also presents a new approach for LOE detection that exploits a combined scheme based on the derivative of the terminal voltage and the derivative power angle of the generator. Comprehensive simulation studies are conducted on various generator conditions and system disturbances to determine the relay setting and to evaluate its performance. These studies demonstrate that the proposed strategy enhances the security and operation time of the LOE relay compared with some existing methods.

کلمات کلیدی:

Loss-of-excitation (LOE) fault, stable power swing (SPS), synchronous generator, LOE relay, detection

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