A new islanding detection technique for multiple mini hydro based on rate of change of reactive power and load connecting strategy

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ABSTRACT

The interconnection of distributed generation (DG) into distribution networks is undergoing a rapid global expansion. It enhances the system's reliability, while simultaneously reduces pollution problems related to the generation of electrical power. To fully utilize the benefits of DGs, certain technical issues need to be addressed. One of the most important issues in this context is islanding detection. This paper presents a new islanding detection technique that is suitable for multiple mini-hydro type DG units. The proposed strategy is based on the rate of change of reactive power and load connecting strategy to detect islanding within the system. For a large power mismatch, islanding is detected by rate of change of reactive power only. However, for a close power mismatch, the rate of change of reactive power initiates a load connecting strategy, which in turn alters the load on the distribution network. This load variation in the distribution network causes a variation in the rate of change of reactive power, which is utilized to distinguish islanding and other events. The simulation results show that the proposed strategy is effective in detecting islanding occurrence in a distribution network.