Abstract

The aim of this paper is to design and construction a wireless control system for three phase loads balancing in a regional transformer. This system is designed to solve the problems of the loads imbalance to avoid the losses of the electricity in the distribution networks and also to protect the elements of the network like transformers from damages. The important parts of the wireless control system are the three phase smart energy meters which equipped at each house within this system. These meters send their electrical measurement quantities wirelessly to the main control system (base station). The base station uses the received electrical measurement quantities of the smart meters to investigate the equilibrium among the three phase lines of the transformer by swapping some phases of the houses. The swap phases are chosen according to the heuristic search algorithm and the equilibrium is achieved when the maximum acceptable rate of PUI (phasing unbalance index) is 10%. Each smart meter in each house is equipped by six contactors used for the phases swapping. The designed wireless control system is tested in several experiment results to indicate it is performance.
References


17. A. Ellerbrock, A. Abdel-Majeed, and S. Tenbohlen, “Design and building of a cheap smart meter”, Institute of Power Transmission and High Voltage Technology, University of...


Index Terms

Computer Science Wireless

Keywords

Smart energy meter, wireless control system, heuristic search algorithm, contactors.