Abstract Format

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Direct Load Analysis and Modeling System

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Abstract

Loads in the power systems are one of the most important parts in the power system studies. Previous work reported in the literature indicates that the parameters of both static and dynamic loads have significant impact on voltage stability of the power systems. Simulation results are critically dependent on the choice of the load models. Having accurate models faithfully capturing load behavior during system disturbances enhances the system operators' ability to anticipate potential emergency conditions and plan and design control systems and response guidelines more precisely. This demands vigilance in proving computer models to represent loads against actual system load behavior, and in assuring that supporting control functions perform as intended.

In this paper, direct load analysis and modeling system is proposed. The system is designed to model the aggregated load automatically based on the load response to system disturbance such as voltage dip. The system could provide analysis and modeling of the load for the connected feeders. It will continuously monitors, analyzes and updates the load model. The system constitutes of a few components such as substation grade computer and disturbance recorders. The system will be installed at the main distribution substation which the loads are connected through outgoing feeders. Normally, protection relays are installed at every feeders in the substation and there are also equipped with disturbance recorder function. Whenever there is new disturbance record available, the file which is in the comtrade format will be transferred from the protection relay to the system using IEC 61850 file transfer protocol through the station bus for further processing and analysis. The system will utilize least square method to determine the load model parameters.

The system could replace the conventional method of load modeling which normally take long time for measuring activities, analysis and modeling work. Furthermore it can only be done periodically and might not accurate due to the nature of load component which is dynamic and keep on changing. The proposed system could provide more accurate and updated model and it would benefit the utility and also the customer. With the accurate load model it could maximize the impact of the peak demand reduction during the implementation of VVO hence at certain extend it could reduce the electricity bill of the customer. From the

utility point of view, accurate and updated load model could optimize the system operation by optimizing the generation reserve and also the power transfer limit.

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