



<b>Thesis Title</b>	State Estimation in Power Distribution System Using Weighted Least Squares Technique
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### ABSTRACT

This thesis studies and analyses the accuracy of state estimation results in distribution system using the weighted least squares technique. Metropolitan Electricity Authority of Thailand (MEA) distribution power system was selected as a case study. MEA's 7 substations with 35 bus partial system was used as the test system.

The accuracy of state estimation results depends on many factors such as measurement data, number, position and type of meters in a system. In addition, if the measurement system is appropriately improved, the accuracy of power system states can be enhanced.

The absolute of percentage error (APE) and the mean absolute of percentage error (MAPE) were used for identifying the accuracy of state estimation results.

From the studies, it is found that the MEA's measurement system can make system observable but show inaccurate estimated states. Since there are some inaccurate measurements, the maximum APE of the reactive power at bus and the transmission line are both about 93 %. The MAPE's are equal to 9.473% and 8.349 % respectively. After improving the measurement system, the MAPE of the reactive power at bus and the transmission line was decreased to 0.188 % and 0.343%. The maximum APE's was also decreased to 1.7 % and 2.0 % respectively. The results show that the accuracy of the state estimation result is enhanced.