ABSTRACT

DYNAMIC VOLTAGE STABILITY PREDICTION OF LAMPUNG'S ELECTRIC POWER SYSTEM USING MAXIMUM LYAPUNOV EXPONENT

By

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Disturbances in operation of electric power system can make changes in voltage stability. Therefore, prediction of dynamic voltage stability before and after disturbances needs to be done. One of method for predicting the dynamic voltage stability is the use of maximum Lyapunov exponent. In this research, dynamic voltage stability of Lampung's electric power system is performed by simulating several types of disturbances that apply in Baturaja – Bukit Kemuning branch. Time-series data of voltage measurements is then used to predict voltage stability using maximum Lyapunov exponent. In three-phase fault simulation, voltage starts to be stable at 2.15 seconds after disturbance. In line to ground fault, double-line to ground fault, and line-to-line fault, voltage starts to be stable at 1.65 seconds after disturbance. When applied loss of line fault, voltage starts to be stable at 2.15 seconds after disturbance. In loss of load fault, voltage starts to be stable at 2.45 seconds after disturbance. The results show that maximum Lyapunov exponent can be used to predict voltage stability dynamically.

Keywords: *voltage stability, disturbances, maximum Lyapunov exponent, dyanmic voltage stability*