ABSTRACT

Transient stability analysis has an important role in maintaining the security of power system operation. Transient stability analysis is generally done by using numerical method simulation, where the integration carried out step by step, from initial point to achieve the dynamic response. There are many methods in determining the transient stability of a power system, one of them is equal area criterion. Equal area criterion provides the ease of determining transient stability quickly. However, this method can only be used in power systems which is consisting of one generator connected to an infinite bus. Therefore, this thesis proposed using the EEAC method (Extended Equal Area Criterion) and Critical Trajectory to be use on multi machine system. A multi machine system is simplified by using the EEAC method, so we get a machine that is suspected as the critical machine. CCT and the critical trajectory is calculated simultaneously. This calculation is demonstrated on a multi machine system. The result, CCT which calculates using critical trajectory methods is 1.3721 with $m = 10$ on the power system which consisting of one generator connected to infinite bus with controller and damping component. For the multi machine system 3 generators and 9 buses, CCT calculation are performed for all fault point which hasn’t been determined accurately when compared with time domain simulation result. The magnitude of CCT which was found closely with the result of time domain simulation is on fault point A and B, 0,3046 and 0,1803.

Keywords: transient stability, CCT (critical clearing time), EEAC (Equal Area Criterion), EAC (Equal Area Criterion), Critical trajectory.