別紙様式８

研 究 主 論 文 抄 録

論文題目　Emergency Control of Power Systems in Steady and Dynamical State
（定態および動態状態における電力システムの緊急制御）

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主論文要旨

Preparation and training of emergency control in power system is one of the important in minimizing the impact of wide spread system disturbance. Impact of wide spread system disturbance can cause partial or complete blackout. Furthermore blackout events can affect to huge economic costs and may even lead to loss of life. Meanwhile, combination of human error and equipment failures had caused the Northeast Blackout on 2003. Control in an emergency state involves special facilities and procedures provided by a utility. It is to maintain and restore viable operation, following an incident. This incident disturbs the system operating conditions to a point where the available system capacity is no longer sufficient to meet demand in all or parts of the system.

Controlled separation is one of the control solutions in emergency control. This thesis shows preparation and training under steady state and dynamic condition for controlled separation. Both condition need to fulfil operational constraints related to asynchronous generator, power imbalance and line capacity limits. The benefit of steady state is to study feasible splitting strategies and optimal placement of Phase Measurement Units. Practically, each region has different power generation, load demand and reserve capacity. This situation creates effectiveness in the dynamics of real-time by using rate of frequency and regional coordination in sub-areas. The reserve margin is then used to identify a sequential load shedding.

This research has revealed tracing power between generation and load for islanded operation to be useful for feasible splitting strategies and optimal placement of Phase Measurement Units. Also, the amount of load shedding over the sub-areas with respect to reserve margin will be a practical value in deregulated environments. Due to effective controlled separation, the system can be stabilized faster with less amount of load to be shed than the uncontrolled separation case.