OPTIMUM COORDINATION OF CAPACITIVE ENERGY STORAGE (CES) AND DUAL INPUT POWER SYSTEM STABILIZER (DIPSS) USING MODIFIED DIFFERENTIAL EVOLUTION ALGORITHM (MDEA) IN 500KV JAVA BALI POWER SYSTEM

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ABSTRACT
Power system dynamic disturbances which caused by load changes can cause the effect of system instability. This phenomenon generally occurs on generator which operates in a state of fully loaded. And lead a great concern of additional control on the system in order to keep the system remain stable. This research propose a coordination of Dual Input Power System Stabilizer (DIPSS) and Capacitive Energy Storage (CES). CES and DIPSS parameter values are optimized by using Modified Differential Evolution Algorithm (MDEA). From the results of simulations that have been carried out, it was discovered that the overshoot of Suralaya power plant region which equiped with optimized DIPSS & CES is $3.9634 \times 10^{-4}$ pu with a settling time of 3.543 seconds. Meanwhile, the overshoot of Non-additional-controlled Suralaya power plant region is $4.2492 \times 10^{-4}$ pu with settling time of more than 5.72 seconds. It can also be concluded that optimized CES & DIPSS can enhance a better reduction of frequency oscillation overshoot and accelerate the frequency oscillation settling time.

Keyword : Dual Input Power System Stabilizer (DIPSS), Capacitive Energy Storage (CES), Multimachine, & Modified Differential Evolution Algorithm (MDEA).