ABSTRACT

Name	:	*Fadhli Naufal Wirawan*
Study Program	:	*Electrical Engineering*
Title	:	*Comparative Simulation of Economic Dispatch on Combined Thermal and PLTS Systems Using Maximum Power Point Tracking with Fuzzy Logic Algorithm and Perturb And Observe Algorithm*

The high price of fossil fuel coal will eventually increase production costs, especially thermal plants. One way to reduce this production cost is to conduct generation planning (economic dispatch) in order to get the most efficient cost. The research objective is to get the most efficient generation scheme in production costs. The research method uses economic dispatch simulation using POWER WORLD software. The addition of PLTS to the thermal generation system is an innovation to reduce the use of coal fuel costs. PLTS has a poor generation efficiency when not added with MPPT, the MPPT system on PLTS has the function of increasing generation efficiency. MPPT has a variety of control algorithms that can be used, such as fuzzy logic algorithms and perturb and observe (P&O) algorithms which are two algorithms that are often used. The simulation method is carried out for solar power plants with MPPT systems in MATLAB/SIMULINK software whose results are combined with thermal systems simulated in POWER WORLD software. The schemes using both MPPT systems are compared and analyzed to see their effect on the efficiency of generation costs. The results showed that PLTS with MPPT system was able to produce 84.06% - 93.78% of the total planned power. When PLTS using the MPPT system is combined with thermal generation especially when it becomes a negative load, the fuel cost reduction reaches 18.48% - 22.41% of the total cost of the thermal power generation system combined with PLTS without MPPT system and even greater when without PLTS. The system using P&O MPPT has 4.8% better efficiency compared to the system using fuzzy logic MPPT during peak radiation conditions.

Keywords: Efficiency, Economic Dispatch, Solar Power Plant, MPPT, Fuzzy Logic, P&O, Thermal Plant