

CHAPTER 6

Conclusions and Recommendation

6.1 Conclusions

Optimal dispatch of generation is very important optimization tasks and operational decision which provides an economic condition for transmission systems. The main constraint is the most of power generations, which are not located at the same distance from center of loads and their tariffs are different. The objective is to find the optimal economic dispatch of each hydro power plant to supply a particular load demand in such a way as to minimize the operating cost. There are many methods that can be used to solve the economic dispatch problem while this research used the lambda iteration method for solving optimal dispatch of generations by using MATLAB programming.

The simulation and results of optimal dispatch system are analyzed which are based on daily load demand from central-1 network of EDL Lao PDR in each month 2014. The results simulated from the Lambda iteration method, which illustrates the scheduling of the hydro power plant when the generators are operated by constraint limits. As seen from the simulated results, the Nam Ngum 5 HPP and Nam Lik 1/2 HPP are generators selected first, when the load demand is low. Because the generation cost of both is the lowest, by the motive of the base tariff plus power transmission system loss is cheaper than other generators. When the load demand increases, due to the limitation of each generator, the higher cost of the generator such as Nam Mang 3 HPP and Nam Ngum 1 HPP in respectively are selected according to load demand, and the cost of the generator. Nam Leuk HPP is scheduled for the last, because this is the most expensive of all the generators.

The optimal load dispatch in this research is divided into two cases. The case 1 is optimal load dispatch by using Lambda iteration method neglecting generator limits. The total actual cost is \$ 135,323,464. The optimal cost is \$ 130,635,187. The cost saving is \$ 4,688,278, which is equivalent to 3.46 percent. And the case 2 is optimal load dispatch by using Lambda iteration method including minimum generator limits. The total actual cost is \$ 135,323,464. The optimal cost is \$ 131,330,731. The cost saving is \$ 3,992,733, which is equivalent to 2.95 percent.

6.2 Recommendation and Further Study

The simulation results of the optimal dispatch of hydropower plant comparing between actual power and optimal power cost. The optimal power cost is lower than actual power cost while the generator runs within the low load as well as these costs are very different. But the generator operates at full load the generation cost is no different. However, the further study in the future should be considered the suggestion as follows:

- 1) The further study of the optimal dispatch should be considered the reservoir rule curve of each hydropower. The water flow rate has the difference volume that compares between the rainy and dry season.
- 2) The maintenance activities schedule and efficiency of the generator should be considered.
- 3) There are several methods for solving the optimal dispatch of power generation. The further study should be considered these methods such as: Artificial neuron network method, Newton-Raphson method, etc. Then select the best result.
- 4) The cost function of generation has calculated from the existing data, if using this cost function to operate with real power system. The cost function needs to be updated for reaching the maximum efficiency.