Name of thesis:
Major: Gird and Power System Code: 62525005
Full name of PhD student: Le Anh Dung
Supervisors:
1/. Associate Professor - Vo Ngoc Dieu
2/. Doctor - Dinh Hoang Bach
Training Institution: University Technology of Hochiminh City

Abstract
Three main problems of optimal power system operation are economic dispatch (ED), optimal power flow (OPF) and optimal reactive power dispatch (ORPD) which can calculate electrical power system operation in the best cost with technical constraints of system requirement. The research contributed to science some below ideas
• Application of PSO, PSO-TVAC, PG-PSOCF and CS methods solve ED, OPD and ORPD problems in power system.
• Calculate ED, OPF and ORPD problems with wind farm connecting.
• Calculate ED, OPF and ORPD problems with wind farm connecting following 24 hours load demand.

Reality Application
Particle swarm optimization algorithms can be applied to optimally adjust economic dispatch, optimal power flow, optimal reactive power dispatch in the power system with large scale than. Moreover, it is possible to apply optimal swarm algorithms to optimally regulate the power grid in Vietnam, provided that there are enough technical parameters to compute the calculation so that the selected operating plan can be selected. Lowest cost of operation ensures stability with technical constraints such as voltage, capacitance, guaranteed transmission power on the line and optimal power loss.

Development Orientation
The result of this problem satisfies the requirements of the load, which can be extended with a larger electrical system at 24 hours, in accordance with the requirements of the electrical system when entering the electricity market. Competitive power is to calculate the capacity of the power plants, the cost of electricity and the selling price to the market to select the best price.

Wind power will develop in Vietnam in the future because Vietnam has appropriate geography, so calculating of power system optimal dispatch with wind farms is necessary and applicable in future. The results of this study are the basis for further development of the optimal swarm algorithm for optimal economic dispatch efficiency, optimal power flow and optimal reactive power dispatch in the power system with wind energy in Vietnam electricity system.

Key words: Economic Dispatch, Optimal Power Flow, Optimal Reactive Power Dispatch, Wind power, Particle Swarm Optimization (PSO), Cuckoo Search (CS)