

**SOLVING UNIT COMMITMENT PROBLEM WITH WIND POWER ENERGY USING
MULTI AGENT EVOLUTIONARY PROGRAMMING OPTIMIZATION TECHNIQUE**

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ABSTRACT

This thesis presents an approach to search for an optimal solution for Unit Commitment Problem with wind power generation. The objectives of this research are to find the optimal cost of generation and to review the effect of the presence of renewable energy which is the wind energy in the conventional Unit Commitment problem. Unit commitment involves the scheduling of start-up and shutdown of generating units, an indirect determines the optimum power should be generated by each unit committed over a period of time to meet the required load demand at minimum possible cost. In this study, Multi Agent Evolutionary Programming has been used to solve the optimal unit commitment for 24 hour periods. Multi Agent Evolutionary Programming is a combination of two Artificial Intelligent techniques which are Multi Agent System and Evolutionary Programming. In this research, the Multi Agent Evolutionary Programming technique has been applied with 10 thermal based generator data along with wind power generation. The 10 thermal generator data are obtained from previous research paper while the data for wind power is collected from power forecasting report by National Renewable Energy Laboratory (NREL). This research has considered a few constraints that go along with Unit Commitment problem such as load demand constraint, generator limit, and 10% reserve margin. The comparison of the result obtained is to observe the performance of Multi Agent Evolutionary Programming technique against conventional Evolutionary Programming technique.

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