SOLVING UNIT COMMITMENT PROBLEM WITH SOLAR PHOTOVOLTAIC AND WIND ENERGY GENERATION BY USING MULTI-AGENT EVOLUTIONARY PROGRAMMING TECHNIQUE

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ABSTRACT

The goal through this paper is to solve unit commitment problem in power system with solar and wind energy generation. This approach objective to find optimal solution using Multi Agent Evolutionary Programming technique to minimize cost when implementing renewable energy and review the effect of solar and wind energy to unit commitment. The conventional unit commitment consists of schedule of start-up cost and shut-down generating unit that meet the demand of power generation. Several Artificial Intelligence (AI) techniques such as Multi Agent and Evolutionary Programming were combine to produce Multi Agent Evolutionary Programming (MAEP) technique. There are 10 generator units with 24 hours periods and a few constraints considered in this study such as generator limit, load demand, spinning reserve margin and hot start-up cost. The combination MAEP algorithm includes mutation process, combination and selection the least cost. It is expected that by implementing MAEP with solar and wind, the cost of operation is optimized rather than without renewable energy conventional Evolutionary Programming technique.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Nowadays, consumers of modern world and society put high demands of the quality power electrical energy provided by the producer. The aim of any electric energy suppliers is to reach the demand of its consumers at a minimum operational cost. When all the generators operate at maximum operation, the costing of the operation will increase. Therefore, turn off the unnecessary generating units could save an operating system cost. An efficient of Unit Commitment (UC) is necessary to satisfy the costing problem. The problem of Unit commitment is resolving the start-up cost of generators to fulfill the estimation demand for certain time in hours which is 24 hours and belongs to a class of combinational optimization problems [1]. Besides, it to minimize the operational cost while get-together the forecasted load demand.

1.2 RESEARCH BACKGROUND

Nowadays, power system planning is facing a few problems which are due to the variation of load demand and rising in population size. Theoretically, in order to supply need demand which is turned on the entire available generating unit. By doing this action, it will costly in the power system planning because the tariff of electricity will arise.