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SOLVING NON-CONVEX ECONOMIC DISPATCH USING WATER CYCLE ALGORITHM

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Abstract:

Economic dispatch (ED) is an extremely challenging part of power system operational planning. ED is defined as a complex constrained engineering optimisation problem that aims to calculate power generation of the generating units in an integrated power system for minimum generation cost. Although ED has been expressed traditionally as a convex optimisation problem, it has become highly complex due in modern power systems to non-smooth (or non-convex) objective functions and various newly added constraints. This paper presents implementation of water cycle algorithm (WCA) on ED problem. WCA is a meta-heuristic population based algorithm which has been recently introduced for solving constrained engineering optimisation problems. WCA has been tested on both non-convex and convex test systems in the presented paper. The non-convex test systems consist of six and thirteen units whereas convex system consists of six units. The effectiveness of WCA has been verified by comparing the simulation results with other algorithms presented in the literature.

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