

Economic Load Dispatch with Valve-Point Loading Effect by Using Differential Evolution Immunized Ant Colony Optimization Technique

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Abstract : Economic load dispatch is performed by the utilities in order to determine the best generation level at the most feasible operating cost. In order to guarantee satisfying energy delivery to the consumer, a precise calculation of generation level is required. In order to achieve accurate and practical solution, several considerations such as prohibited operating zones, valve-point effect and ramp-rate limit need to be taken into account. However, these considerations cause the optimization to become complex and difficult to solve. This research focuses on the valve-point effect that causes ripple in the fuel-cost curve. This paper also proposes Differential Evolution Immunized Ant Colony Optimization (DEIANT) in solving economic load dispatch problem with valve-point effect. Comparative studies involving DEIANT, EP and ACO are conducted on IEEE 30-Bus RTS for performance assessments. Results indicate that DEIANT is superior to the other compared methods in terms of calculating lower operating cost and power loss.

Keywords : ant colony optimization (ACO), differential evolution (DE), differential evolution immunized ant colony optimization (DEIANT), economic load dispatch (ELD)

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