

## A Comparison of Memetic Algorithms in a Generator Maintenance Scheduling Problem for Trinidad and Tobago

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**Abstract:** *Power generation companies have to meet consumer demand and reliability criteria. The maintenance of generators needs to be performed regularly to ensure a reliable supply of electricity. An increase in repair frequency will result in greater maintenance cost together with an expected decrease in capital loss due to generator failure. An optimal maintenance schedule is therefore needed to find the best suited trade-off and lower the overall operation cost. Maintenance scheduling is a combinatorial optimisation problem for which an exhaustive search is typically infeasible due to the large size of the solution space. Metaheuristic optimisation techniques are therefore used to approximate global optimum schedules in finite time. This paper compares the uses of the local search methods (hill climbing, tabu search, simulated annealing) against genetic and memetic algorithms in the solution of the generator maintenance scheduling problem. The solution methods improve the previously implemented solution of generator scheduling for the Power Generation Company of Trinidad and Tobago.*

**Keywords:** *Generator, maintenance scheduling, tabu search, simulated annealing, genetic algorithm, memetic algorithm*